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Factor Copula Models and Their Application in Studying the Dependence of the Exchange Rate Returns

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Abstract

This paper applies multivariate factor copula modeling methods to study the dependence relationships of exchange rates. We found that conditional on the common factors, the dependence among the chosen currencies is weakly asymmetric, and the two-factor Gaussian copula modeling hypothesis is more appropriate.

Keywords: Exchange rate, Gaussian Copula, Gumbel Copula, Factor analysis, Principle component analysis

1. Introduction

The global financial crisis that began in 2007 has led to extreme volatility in the foreign exchange market. The movement of the Canadian dollar has a great impact on the Canadian people's living standards and domestic economy. The Canadian government needs to predict the position of the Canadian dollar in global markets quickly in order to stabilize the economy and minimize the risk of holding different types of currencies. Corporations need to know the same information in order to minimize the risk of holding certain currencies when they are conducting international business. Individual investors also increasingly need to know the same information to plan household budgets and change consumption habits to accommodate the rising and falling currency. It is therefore necessary, and important, to investigate the relationships among the Canadian dollar and other currencies, especially during volatile periods. This research will examine these relationships during economic booms and recessions.

One of the simplest and most commonly used approaches to study dependence among the exchange rates is to calculate the linear correlation. Unfortunately, this approach is problematic. First, it is a widely recognized that the return data usually exhibit typical asymmetric distributions instead of a symmetric normal distribution. Second, the linear correlation cannot measure the dependence structure (*i.e.,* how the markets depend on each other). The exchange rate returns' correlations may increase more when the economy is in recession than when the economy is booming. The linear correlation coefficient may underestimate the dependence of the financial exchange markets during the crisis since it does not capture the excess co-movements when the markets move downwards (Patton, 2006; Patton, 2009). Therefore, the linear correlation coefficients are inappropriate. Fortunately, an alternative approach, copula modelling, can overcome the limitations of the linear correlation coefficients technique. Therefore, as suggested by Hu (2006), this paper applies copulas to study both dependence degree and dependence structure among the exchange rate returns.

A copula is a cumulative distribution function connecting multivariate marginal distributions in a specified form. Usually, researchers can obtain information about the distributions of the marginal functions, but it is difficult to accurately specify joint distributions. Copula modelling offers an important improvement in this respect: for example, in a bivariate case, when both marginals are Gaussian and the copula has a Gaussian distribution, the joint distribution generated will be Gaussian as well. However, even if the marginals are not Gaussian, a copula approach can still be used to generate a joint distribution (Hu, 2006; Longin and Solnik, 2001).

Besides modelling the joint distribution with copulas, this paper applies factor analysis to identify the common factors and construct two-factor copula models to study the dependence among the exchange rate returns. The common factors play an important role in determining the joint dependence among the returns. The common factors can be oil price, global consumer confidence index, or the combination of these factors. When the returns on these factors change, all exchange rate returns will be affected to different degrees depending on how much their representative economies are tied with these factors, and this contributes to the asymmetric joint distributions of the chosen returns. To focus solely on the interactions of the dependence among the currencies themselves, the copula models conditional on the common factors (also named as factor copula models in this paper) are more preferable. The common factors, also known as principal components in this study, can be found by using a principal component analysis technique, which will be described in further details in the methodology section.

In contrast to the existing literature that focuses mainly on the bivariate studies, this paper focuses on Gaussian, Clayton, and Gumbel copula modelling in the multivariate case. The aim of this paper is to apply factor copula models to study dependence relationships among daily returns of these chosen exchange rates. In addition, this paper confirms if there is asymmetric dependence among the chosen exchange rate returns or not, and provides suggestions on identifying the appropriate copula for the chosen exchange rates.

The structure of the remainder of this paper is organized as follows: Section 2 presents a review of relevant literature; Section 3 reviews the history, basic concepts, special forms and properties of copulas selected for this study, and a brief introduction on principal component analysis; Section 4 describes the data used for empirical investigation and estimation procedures, and finally, the last section concludes the study and contains suggestions for future research.

2. Literature Review

The first few scholars thoroughly introduced one-factor Gaussian copulas, one-factor mean variance Gaussian mixtures, and one-factor Archimedean copulas. The factor approach helped achieve the goal of data reduction by locating the common factor variables affecting the selected data series. Conditional on these factors, the copulas can better assist in identifying the dependence relationships and model the chosen financial data. Furthermore, Anderson and Sidenius (2004) extended the standard Gaussian copula model to two new models to study the portfolio default loss. However, the existing studies focus mainly on the one-factor copulas. In contrast, this research focuses on using two-factor copulas, and the selected copula models are Gaussian, Gumbel, and Clayton copulas.

The attention of exchange rates has gradually shifted towards using copula tools to verify if the distributions of these exchange rates are asymmetric and to model their dependence. These studies will in turn assist the risk management of the international investment portfolio that can be significantly affected by the fluctuations in currencies. Hurd, Salmon, and Schleicher (2007) applied copulas to construct bivariate foreign exchange distributions with a focus on the application of the Sterling Exchange Rate Index. Built on their study, Patton (2006) extended the copulas conditional on variables or common factors found through the factor approach, and constructed flexible models of the conditional dependence structure of the mark-dollar and yen-dollar exchange rates. Notably, the research that has been done focuses on applying bivariate copulas only for the dependence between two exchange rates. This research contributes to the existing literature by focusing on multivariate factor copula models to study four exchange rates: CAN/U.S., pound/U.S., yen/U.S., and euro/U.S. dollar.

3. Methodology

3.1 Definitions and Properties of Copula Functions

Before we proceed to the foundational theorem for copulas due to Sklar (1959), we begin with the formal definition of "copula:

Definition 1*:* A two-dimensional copula is a function C: $[0,1]^2 \rightarrow [0,1]$ which has the following properties:

(1) *C (u, v)* is increasing in u and v;

(2) *C(0, v) = C(u, 0) = 0, C(1, v) = v, C(u, 1) = u;*

(3) For every $u_1, u_2, v_1, v_2 \in [0,1]$ such that $u_1 < u_2$ and $v_1 < v_2$, we have $C(u_2, v_2) - C(u_2, v_1) - C(u_1, v_2) + C(u_1, v_1) \geq 0$;

The first property indicates that the joint distribution function increases when allowing one variable to increase while keeping the other one constant. The second property ensures that the copula function is zero when the probability of one variable is zero. Additionally, the joint probability is determined by the marginal probability that is not equal to one.

To further introduce the formal definition of copulas and show how copulas are used to restore joint distributions for marginals, now we state Sklar's Theorem.

Sklar's Theorem in n-dimensions (1959): Let H be an n-dimensional distribution function with marginal $F_i(\cdot)$ with i=1, … , n. Then, there exists a copula C such that for random variables X_i we have

$$H(x_1, x_2, x_3, \ldots, x_n) = C(F_1(x_1), F_2(x_2), \ldots, F_n(x_n)).$$

If $F_i(\cdot)$ are continuous for all i=1, … , n, then C is unique. Conversely, if $F_i(\cdot)$ are marginals or CDFs and C is a copula with a range of $[0,1]^n$, then the function H defined in (1) is a joint distribution function with one-dimensional marginals $F_i(\cdot)$. Notably, when H is continuous, the unique C will be

$$C(u_1, u_2, \ldots, u_n) = H(F_1^{-1}(u_1), F_1^{2}(u_2), \ldots, F_n^{-n}(u_n)).$$

Applying a copula function to restore the bivariate distribution has several advantages. First, it provides flexibility in the model specification by separating the specifications of the marginals from those of the copula. In this way, it is possible to construct a complex non-Gaussian joint distribution. Second, a copula is a powerful technique because it directly models the dependence between the marginal distribution functions.

3.2 Some Common Copulas

After giving a general definition for copulas, in this section, we present several important copulas and their properties. We first define the product copula, which is the simplest copula function. Then we define the Gaussian copula, which is the basic and most commonly used copula. After this, we present an important class of copula functions: Archimedean copulas. The copulas that fall in this class can be stated directly and usually have a simple closed form expression. In addition, these copulas are popular because they can be easily derived and can capture a wide range of dependence structures.

3.2.1 Gaussian Copula

As Schmidt (2006) outlined in his work, Gaussian copulas are an extension from the multivariate normal distribution. Let us assume that X_1 and X_2 are normally distributed and they are also jointly normal. Then we can use a linear correlation to fully describe their dependence structure. Let Φ_Σ be the CDF of multidimensional normal distribution, the multivariate Gaussian copula for a correlation matrix Σ is given by

$$C_\Sigma^G(u) = \Phi_\Sigma(\Phi^{-1}(u_1), \ldots, \Phi^{-1}(u_n); \Sigma) \quad (1)$$

Note that the linear correlation is a good and efficient measure of the dependence relationships in this case. The equivalent way of expressing Gaussian independence is zero correlation. Positive (or negative) sign of θ reveals a positive (or negative) linear dependence relationship among the variables.

3.2.2 Clayton Copula

As mentioned by Trivedi and Zimmer (2005), with $\theta \in [-1, \infty]\backslash\{0\}$ and n ≥ 2, the *n* dimensions Clayton Copula takes the form

$$C_\theta^n(u) = \left(u_1^{-\theta} + u_2^{-\theta} + \cdots + u_n^{-\theta} - n + 1\right)^{-\frac{1}{\theta}} \quad (2)$$

3.2.3 Gumbel Copula.

As mentioned by Trivedi and Zimmer (2005), if $\theta \geq 1$ and any $n \geq 2$, we have *n* dimensions Gumbel copulas as

$$C_\theta^n(u) = \exp(-[(-\ln u_1)^\theta + (-\ln u_2)^\theta + \cdots + (-\ln u_n)^\theta]^{-1/\theta}) \quad (3)$$

3.3 Measuring Dependence

3.3.1 Linear Correlation

In statistics and economics literature, the most familiar concept in studying dependence is the correlation coefficient between two random variables. The correlation coefficient ρ is a well studied measure of linear dependence and it is symmetric. Note that the correlation measure is invariant under linear transformations of the variables, but it does not hold for general transformations. Finally, ρ=0 implies independence for bivariate normal distributed random variables, but it does not hold in general.

3.3.2 Rank Correlation

Unlike linear correlation, rank correlation is an alternative measure of nonlinear dependence relationships among variables with non-Gaussian marginals. As implied by its name, rank correlation concentrates on modeling the rankings of given observed data rather than on the actual values of the data themselves. Given by Trivedi and Zimmer (2005), there are two well-established measures of rank correlation, *Spearman's rho* and *Kendall's tau*, which provide a way to fit copulas to data.

Both Spearman's rho, $\rho_S(x,y)$, and Kendall's tau, $\rho_\tau(x,y)$, have the following four properties: first, they are symmetric; second, they are bounded by (-1, 1), and their lower and upper bounds on this inequality measure perfect negative and positive linear dependence; third, they are equal to zero when the random variables are independent from each other; finally, they are co- and counter- monotonic. The expressions in terms of copulas for the Rank correlations are as follows:

$$\rho_S(x,y) = 12\int_0^1\int_0^1 \{C(u_1,u_2) - u_1u_2\}du_1du_2$$

and

$$\rho_\tau(x,y) = 4\int_0^1\int_0^1 C(u_1,u_2)dC(u_1,u_2) - 1$$

According to Nelson (1999), Kendall's tau and Spearman's rho are equivalent with the same underlying assumptions, but they usually have similar but different magnitudes. These two methods can verify the changes in the dependence relationships in different subsamples since the directions of the changes are usually the same under both methods. In this paper, our results include the estimates of the Kendall's tau, the Spearman's rho, as well as the tail indices (i.e., tail dependence), which is introduced in the following section.

3.3.3 Tail Dependence

n this subsection, we introduce the concept of tail dependence, which is applied to measure the dependence between the extreme values of random variables, for copula models. We refer to extreme co-movement relationships as concepts of *concordance* and *discordance*. Basically, according to Trivedi and Zimmer (2005), concordance means that there is a dependent relationship between large values of two random variables, and discordance means that there is a dependent relationship between large values of one random variable with small values of another.

To find the tail dependence with our copula functions, the following calculations give upper (λ_U) and lower tail (λ_L) dependence:

$$\lambda_U = \lim_{m\to 1^-} P(x_2 > F_2^{-1}(m) \mid x_1 > F_1^{-1}(m)) = \lim_{m\to 1^-} \frac{C^S(m.m)}{1-m} \tag{4}$$

and

$$\lambda_L = \lim_{m\to 0^+} P(x_2 \le F_2^{-1}(m) \mid x_1 \le F_1^{-1}(m)) = \lim_{m\to 0^+} \frac{C^S(m.m)}{1-m} \tag{5}$$

The left and right tail dependences of the Gaussian Copula are identical. Hence, the Gaussian Copula is a good choice for modeling between two variables when there is no strong tail dependence. Or, in the context of exchange rate returns, when two rates are not strongly correlated at low (or high) values but less correlated at high (or low) values, the Gaussian copula is an appropriate modeling choice.

The Clayton Copula has strong positive left tail dependence and relatively weak right tail dependence. In other words, it models extreme negative co-movements. The Clayton Copula is a good choice for modeling between two variables when their left tail dependence is strong. Or, in the context of exchange rate returns, when two returns are strongly correlated at low values but less correlated at high values, the Clayton copula is an appropriate modeling choice.

The Gumbel copula has strong positive right tail dependence and relatively weak left tail dependence. In other words, it does not tolerate extreme negative co-movements. In the context of exchange rate returns, when correlation between two returns is strong in the right tail of the joint distribution, the Gumbel copula is an appropriate choice.

Therefore, if we can estimate the dependence parameter in each copula function, we can easily calculate out the values of rank correlations, which include both the Kendall's tau and the Spearman's rho, and the tail dependence structure for that copula.

4. Factor Copula Structure

In this paper, we introduce an alternative way of approaching the problem of finding the dependence relationships between fluctuations on exchange rates by using copula models conditional on the common factors found through the factor analysis.

Factor analysis is based on the assumption that some underlying factors, which are smaller in number than the number of observed variables, are responsible for the co-variation among the observed variables. This analysis

method is mainly used for data reduction purposes. This paper focuses on the principal component analysis method, which is the most common form of factor analysis. These principal components are able to account for most of the variance in the observed exchange rate returns.

Instead of directly applying the marginal distributions of the exchange rate returns into our copula function, we can use their marginals conditional on the common factors. The correlation coefficients of these returns depend on the estimated common factors. The ways the returns are interrelated with each other depend largely on the common factors. To focus solely on the interactions among the returns, the factor copula correlations conditional on the estimated common factors can more accurately describe the dependence relationships among multiple variables. Specifically, conditional on the common factors, the exchange rate returns will only dependent on the joint distributions of Z_1, Z_2, …, Z_n, which are the unique parts for their respective exchange rate returns.

4.1 Two factor Gaussian Copulas.

We define r_i (i=1, 2, …, n) as the returns on the exchange rates. If these returns were normally distributed, the joint distribution of them may be multivariate normal. As is well-known in the academic world, the probability distribution of financial series tends not be normal. To apply a Gaussian copula to model our data, we followed the suggestions of Hull (2009) and first transformed the returns into new variables x_i (i=1, 2, …, n) using $x_i = N^{-1}[Q_i(r_i)]$, i=1, 2, …, n, where N^{-1} is the inverse of the cumulative normal distribution and Q_i (i=1, 2, …, n) are the cumulative distribution functions for respective exchange rate returns, r_i (i=1, 2, …, n). In this transformation, the new variables, x_i, are constructed to have a standard normal distribution with mean equals to zero and standard deviation equals to one. This transformation is percentile to percentile so that the correlations among the returns can be measured by the ones among the new variables. Then introducing a Gaussian copula, we can study the copula correlations or dependence relationships among financial returns that do not have normal distribution, and separate the estimations for unconditional marginal distributions and the joint distribution.

In the two-factor model,

$$x_i = \alpha_i F_1 + \beta_i F_2 + \sqrt{1-\alpha_i-\beta_i}\,Z_i \tag{6}$$

In this equation, F_1 and F_2 are two common factors affecting defaults for all companies and Z_i have independent standard normal distributions. The α_i and β_i are constant parameters between -1 and +1. The correlation between x_i and x_j is $\alpha_i\alpha_j + \beta_i\beta_j$.

Suppose that the probability that exchange rate i will be below a threshold of m is $Q_i(m)$. Under the Gaussian copula model, such low returns happen when $N(x_i)= Q_i(m)$ or $x_i= N^{-1}[Q_i(m)]$. From equation (7), this condition is

$$Z_i = \frac{N^{-1}[Q_i(m)] - \alpha_i F_1 - \beta_i F_2}{\sqrt{1-\alpha_i-\beta_i}} \tag{7}$$

Conditional on the value of the factors F_1 and F_2, the probability of having a return lower than m is therefore

$$Q_i(m \mid F) = N\left(\frac{N^{-1}[Q_i(m)] - \alpha_i F_1 - \beta_i F_2}{\sqrt{1-\alpha_i-\beta_i}}\right) \tag{8}$$

Therefore, setting a threshold of m, we can find out the probability of having such disappointing returns.

4.2 Two-Factor Archimedean Copulas

In addition, by using the factors we found, we can extend the copula models for conditional variables. Besides one factor Gaussian copulas, Granger *et al*. (2006) outlined the one-factor Clayton copula model in their paper. Based on their work, we extended their model and constructed two-factor Clayton and Gumbel copulas.

The first step is to identify the common factors. The common factors are extracted from the returns without transforming them to normal variables. Instead of having a normal distribution, the common factors follow a Gamma distribution with parameter $1/\theta$, where $\theta>0$, and with a scale parameter equal to one. Then we define

$$X_i = \left(1 - \frac{\ln(U_i)}{F}\right)^{-1/\theta}$$

where U_i (i=1, …, n) are independent uniform random variables and they are independent from the common factors, F. Conditionally on the common factors, for Clayton copula, we have

$$Q_i^{Clayton}(m \mid F) = \exp\left(V\left(1 - Q_i(t)^{-\theta}\right)\right)$$

and using similar logic for Gumbel copula, we have

$$Q_i^{Gumbel}(m \mid F) = \exp(-V \log(Q_i(t)^{\theta}))$$

Using above conditional CDFs, we were able to find more accurate copula correlations or dependence relationships among the exchange rate returns excluding the common factors.

5. Estimation Methods

This paper's main interest is to estimate the dependence parameters in copula functions. We adopt the approach called *two-stage maximum likelihood estimation method*: in the first stage, the marginal distribution functions are estimated with the assumption of independence between the two random variables; in the second stage, the estimated marginal distributions are substituted into the copula function and the dependence parameter of this copula function is estimated. The marginal distributions and the dependence structure are independently estimated. Using the two-stage maximum likelihood method, we don't need to make any assumption on the marginal distributions and we can use the estimated marginal distributions, which mean that the estimated distributions are free of specification error. Therefore, this paper focuses on the two-stage maximum likelihood method.

6. Data

The data used in this study were from DataStream. Our research interest is to investigate the dependence among foreign exchange rates. The data of interest therefore were the daily returns of exchange rates in four different countries/regions. These selected currencies are the Canadian Dollar, British Pound, Japanese Yen, and Euro. The abbreviations used are CAD (Canadian Dollar), GBP (British Pound), JPY (Japanese Yen), and EUR (Euro).

We chose the start date of launching the Euro, which is January 2nd, 2002, as the cut-off point, and eliminated any observations before this. The sample data end with October 29th, 2010. This reduces the sample to 1,730 observations. In addition, the current financial crisis would influence the empirical results we obtained on a large scale. It is interesting to compare the pre- and post- crisis empirical results of sample observations. To achieve this goal, we used the same filtered sample data but we further separated the sample by the cut-off date of July 1st, 2007 (note: this is a rough estimation of the start date for our current crisis). The first subsample has 1,037 observations between January 2nd, 2002 and June 30th, 2007, while the second subsample has 693 observations between July 2nd, 2007 and October 29th, 2010.

7. Empirical Results

7.1 Gaussian Copula with Factor Loadings

After transforming the non-Gaussian exchange rate returns into the normal variables, we found the common factors of these variables with the factor loadings shown in Table 5a and the percentages that the principal components or common factors can explain the underlying data are exhibited in Table 5b.

Since the transformation is a percentile-to-percentile transformation (note: the details are described under the section of the methodology), the correlations among the exchange rate returns can be measured as the correlations among these transformed normal variables, and these calculated correlations are referred to as the copula correlations (Hull, 2008). The copula correlations in both the unconditional and two-factor Gaussian Copula models are reported in Tables 6 and 7.

Comparing the Tables 6 and 7 with Table 4, we noticed that without using copula models that can capture nonlinear relationships, there are no significant linear correlations of the CAN/US returns with the JPY/US as shown in Table 4, while using copula models, we identified significant copula correlations as shown in both Tables 6 and 7. As we can see from both Tables 6 and 7, the copula correlations tend to exhibit a mixed result in terms of increased or decreased dependence relationships. All copula correlations between the exchange rate returns decreased significantly after the crisis occurred except the correlations of the CAN/US returns with the JPY/US and UK/US returns for the unconditional Gaussian copula models. For the two-factor copula, all copula correlations decreased significantly after the crisis occurred except the correlations of the CAN/US returns with the JPY/US and EUR/US returns. This can be explained by the relative stability of the economy and banking system in Canada compared to the ones in Japan, UK, and European.

7.2 Clayton and Gumbel Copula with Factor Loadings

For Clayton and Gumbel Copulas, the estimates of the common factor loadings for the exchange rate returns are exhibited in Table 8a and the percentages that the principal components or common factors can explain the underlying data are exhibited in Table 8b.

Conditional on the common factors, the estimates for the dependence parameters, the rank correlations, and tail

indices for both the unconditional and two-factor Clayton and Gumbel copulas are shown in Table 9.

Table 9 shows that the dependence parameters tend to decrease after the crisis occurred. In other words, after the crisis occurred, the returns on the currencies tend to be less dependent on each other, and the dependence parameters of unconditional Gumbel copula tend to be more than double the estimations of unconditional Clayton copula. This means that the dependence among the returns is asymmetric, and these returns are more negatively dependent on each other. Therefore, the models such as Gumbel copula that can capture the extreme negative dependence would be a better fit to the chosen currencies. Examining the null hypothesis that the dependence among the returns of the spot exchange rates can be modelled by the Gaussian, Gumbel, or Clayton copulas, the goodness-of-fit tests confirmed that the Gumbel copula would be a better fit among the three copulas to model the unconditional data series.

Using one of the common factor analysis techniques, the principal component analysis, two common factors were identified for the chosen currencies for all three different samples (i.e., the sample before the crisis occurred, the sample since the crisis occurred, and the full sample that includes at least one full business cycle). Conditional on these common factors, the estimated dependence parameters of the Clayton and Gumbel copulas are found to be similar to each other as shown in Table 9. In other words, the chosen exchange rates exhibited no clear asymmetric dependence, and thus, both the Clayton and Gumbel copulas are not appropriate tools for modelling the joint dependence of the chosen exchange rate returns. These patterns are also evident when comparing the estimated results of the Kendall' Tau, Spearman's Rho, and Tail dependence between the unconditional and two-factor copula models. Furthermore, the goodness-of-fit tests showed that the two-factor Gaussian copula is a good fit for modelling the joint distribution of the chosen currencies. Therefore, the copula correlations obtained from the conditional Gaussian copula are reliable estimates.

Notably, without conditional on the common factors into the copula modelling analysis, the joint dependence among the returns is asymmetric, and thus the unconditional Gumbel copula is a more appropriate tool to model these returns' joint dependence. However, conditional on the common factors, the joint dependence is symmetric, and thus the two-factor Gaussian copula is a better tool. These findings are particularly interesting since they confirm that the common factors play an important role in determining the joint dependence among the exchange rate returns. The common factors can be oil price, global consumer confidence index, or the combination of these factors. When the returns on these factors change, all exchange rate returns will be affected to different degrees depending on how much their representative economies are tied with these factors, and this contributes to the asymmetric joint distributions of the chosen returns. To focus solely on the interactions of the dependence among the currencies themselves, the two-factor Gaussian copula models conditional on the common factors are preferable.

Summing up, the Clayton copula would fit best if negative changes in the chosen exchange rate returns are more highly correlated than positive changes; the Gumbel copula would fit best in the opposite situation. The Gaussian copula fits best if the dependence among the data series is symmetric. The above results analysis indicates that the estimated dependence results are similar under both the conditional Clayton and Gumbel copulas. Combining with the goodness-of-fit tests, the results analysis leads the conclusion that the two-factor Gaussian copula is a good fit for these four exchange rate returns. Malevergne and Sornette (2003) failed to reject the Gaussian copula hypothesis at the 95% confidence level for more than 50% of the pairs of currencies over the five-year time interval. In this research, the study is extended from the pairs of currencies to the joint distributions of the chosen four currencies, and found that the symmetric joint dependence among the returns of these currencies can be appropriately modeled with the Gaussian copula hypothesis.

8. Conclusions

This paper applies multivariate copula modeling methods in order to study the dependence relationships of daily returns of the four exchange rates: the Canadian Dollar, British Pound, Japanese Yen, and Euro. Conditional on the common factors identified, the copulas are used to estimate the dependence parameters (theta) and their corresponding rank correlation (e.g., Spearman's rho) for two different copulas: Clayton and Gumbel copulas. These two copulas capture the left and right tail dependence, respectively. For the Gaussian copula, we obtained the linear correlation parameters instead of rank correlations to capture the dependence relationships. In the two-step estimation approach, we first obtained empirical CDFs to model the marginal distribution functions, and then we used these CDFs to estimate the dependence parameter in the maximum likelihood function for each copula. For exchange rate returns in our case, the copula modeling method gives more accurate results on the dependence relationships since we are able to utilize this method to capture the nonlinear dependence relationships between non-Gaussian daily returns data of exchange rates. Notably, since the common factors may affect the chosen exchange rates to different degrees and this may contribute to the asymmetric dependence measures, to focus solely

on the interactions among the exchange rates, we used the copula models conditional on the common factors, which are estimated from principal component analysis.

A few researchers such as Longin and Solnik (2001) found that the stock market exhibit greater left tail dependence, and in other words, the stock markets tend more likely to crash together than go up together. This intrigues us to explore if the foreign exchange markets exhibit similar pattern, and in other words, whether the assumption that the chosen exchange rates have a symmetric dependence structure is consistent with the data. One of the key findings of this paper is that, without conditional on the common factors, the dependence among the chosen currencies is strongly asymmetric and the unconditional Gumbel copula is preferable. In contrast, another key finding is that, conditional on the common factors, the dependence among the chosen currencies is weakly asymmetric and the conditional Gaussian copula modelling hypothesis is more appropriate.

This paper may serve as a brief introduction to the concept of factor copulas and their modeling and estimation methods. These techniques determine more accurate dependent relationships between currencies and better assist the risk assessment, portfolio management, option pricing, and hedging at government, corporate, and individual investor levels. Since 2001, the literature on copulas has grown quickly in the fields of finance and economics. There are several directions for future research and applications on conditional copula modeling that we would like to point out here. First, it may be of interest to apply the factor copula modelling method to study dependence relationships among the foreign exchange markets and the financial stock markets. Factor copula modeling could also be applied to risk management and asset pricing. In addition, the copulas we used and other copulas could be extended to model the joint distribution of returns, volume, and duration between transactions for foreign exchange rates.

References

Andersen, L., & Sidenius, J. (2004). Extensions to the Gaussian copula: random recovery and random factor loadings. *Journal of Credit Risk*. 1(1), 29-70.

Granger, C. W. J., Terasvrta, T., & Patton, A. J. (2006). Common Factors in Conditional Distributions for Bivariate Time Series. *Journal of Econometrics,* 132(1), 43-57. http://dx.doi.org/10.1016/j.jeconom.2005.01.022

Hurd, M., Salmon, M., & Schleicher, C. (2007). Using copulas to construct bivariate foreign exchange distributions with an application to the sterling exchange rate index, *Bank of England working papers*, 334, Bank of England.

Hu, L. (2006). Dependence patterns across financial markets: a mixed copula approach. *Applied Financial Economics*, 16(10), 717-729. http://dx.doi.org/10.1080/09603100500426515

Hull, J. (2008). *Options, futures, and other derivatives*, (7th ed.) New Jersey: Pearson Education, (Chapter 22).

Jolliffe, I. T. (1986). *Principal Components Analysis,* (1st ed.) New York: Springer.

Longin, F., & Solnik, B. (2001). Extreme correlation of international equity markets. *Journal of Finance*, 56(2), 649-676. http://dx.doi.org/10.1111/0022-1082.00340

Malevergne, Y., & Sornette, D. (2003). Testing the Gaussian copula hypothesis for financial assets dependence. *Quantitative Finance*, 3(4), 231-250. http://dx.doi.org/10.1088/1469-7688/3/4/301

Nelson, R. B. (1999). *An Introduction to Copulas,* New York: Springer, (chapter 5).

Patton, A. (2006). Modelling asymmetric exchange rate dependence. *International Economic Review*, 47(2), 527-556. http://dx.doi.org/10.1111/j.1468-2354.2006.00387.x

Patton, A. (2009). Copula-based models for financial time series, in: T.G. Andersen, R. A. Davies, J. P. Kreiss, and T. Mikosch, editions. *Handbook of Financial Times Series*, Berlin: Springer.

Schmidt, T. (2006). An Infinite Factor Model for Credit Risk. *International Journal of Theoretical and Applied Finance*, 9(1), 43-68. http://dx.doi.org/10.1142/S0219024906003482

Sklar, A. (1959). Fonctions de répartition à n dimensions et leurs marges. *Publications de l'Institut de Statistique de L'Université de Paris*, 8, 229-31.

Trivedi, P., & Zimmer, D. (2005). Copula modeling: an introduction for practitioners. *Foundations and Trends in Econometrics,* 1(1), 1-111. http://dx.doi.org/10.1561/0800000005

Table 5a. Factor Loadings of the Transformed Normal Variables

	Full Sample			Pre-Crisis Sample			Post-Crisis Sample		
	Factor 1	Factor 2	Uniqueness	Factor 1	Factor 2	Uniqueness	Factor 1	Factor 2	Uniqueness
rcad	0.46	-0.66	0.35	0.03	0.97	0.051	0.66	-0.35	0.448
reur	0.89	0.04	0.21	0.88	0.19	0.195	0.86	0.14	0.236
rjpy	0.86	0.03	0.26	0.88	0.11	0.215	0.84	0.01	0.298
rgdp	0.33	0.79	0.27	0.66	-0.19	0.535	0.02	0.96	0.081

Table 5b. Proportions Explained by the Common Factors of the Transformed Variables

	Proportion of Variance		
Proportion Explained by	Full Sample	Pre-Crisis Sample	Post-crisis sample
Factor 1	0.46	0.49	0.47
Factor 2	0.27	0.26	0.26
Cumulative Proportions	0.73	0.75	0.73

Table 6. Unconditional Gaussian Copula Results

	Full Sample	Pre-Crisis Sample	Post-Crisis Sample
Rho (rc, rj)	0.266391	0.157107	0.398597
Rho (rc, rg)	0.212978	0.083562	0.354494
Rho (rc, re)	-0.06569	0.003878	-0.14168
Rho (rg, rj)	0.683859	0.761216	0.625544
Rho (re, rj)	0.223964	0.371452	0.072583
Rho (re, rg)	0.165226	0.363254	-0.03366

Table 7. Factor Gaussian Copula Results

	Full Sample	Pre-Crisis Sample	Post-Crisis Sample
Rho (rc, rj)	0.751957	0.264077	0.952702
Rho (rc, rg)	-0.73271	-0.42395	-0.61651
Rho (rc, re)	0.470419	0.227673	0.714544
Rho (rg, rj)	-0.12428	0.652986	-0.46903
Rho (re, rj)	0.910232	0.913827	0.866368
Rho (re, rg)	0.153417	0.713231	-0.04502

Table 8a. Factor Loadings of the Exchange Rate Returns

	Full Sample			Pre-Crisis Sample			Post-Crisis Sample		
	Factor 1	Factor 2	Uniqueness	Factor 1	Factor 2	Uniqueness	Factor 1	Factor 2	Uniqueness
rcad	0.56	-0.55	0.38	0.04	0.97	0.051	0.67	-0.39	0.398
reur	0.89	0.14	0.18	0.88	0.2	0.188	0.88	0.18	0.19
rjpy	0.19	0.89	0.18	0.65	-0.19	0.539	0.02	0.96	0.086
rgdp	0.86	0.03	0.25	0.88	0.11	0.217	0.85	-0.02	0.273

Table 8b. Proportion Explained by the Common Factors of the Exchange Rate Returns

	Proportion of Variance		
Proportion Explained by	Full Sample	Pre-Crisis Sample	Post-crisis sample
Factor 1	0.48	0.49	0.49
Factor 2	0.28	0.26	0.27
Cumulative Proportions	0.75	0.75	0.76

Table 9. Unconditional and Factor Clayton & Gumbel Copula Estimation Results

Copula		Full Sample	Pre-Crisis Sample	Post-Crisis Sample
	Dependence Parameter	0.5182035	0.6735244	0.4390656
Unconditional	Kendall's Tau	0.205783	0.2519238	0.1800138
Clayton Copula	Spearman's Rho	0.3038211	0.368643	0.2669235
	Tail Index	[0.26247, 0]	[0.3573161, 0]	[0.2062457, 0]
	Dependence Parameter	1.266502	1.337486	1.237634
Unconditional	Kendall's Tau	0.2104238	0.2523284	0.1920068
Gumbel Copula	Spearman's Rho	0.3104698	0.3683127	0.2841702
	Tail Index	[0, 0.27143]	[0, 0.3209192]	[0, 0.2492256]
	Dependence Parameter	4.197289	3.872766	3.712977
Factor	Kendall's Tau	0.6770352	0.6588136	0.6505415
Clayton Copula	Spearman's Rho	0.8551584	0.8399345	0.8328992
	Tail Index	[0.847617,0]	[0.8357017, 0]	[0.8301302, 0]
	Dependence Parameter	3.595267	3.685626	3.289485
Factor	Kendall's Tau	0.7218565	0.7286757	0.696001
Gumbel Copula	Spearman's Rho	0.8923946	0.8973188	0.8730768
	Tail Index	[0, 0.78736]	[0, 0.7930848]	[0, 0.7654383]

Testing Control, Innovation and Enjoy as External Variables to the Technology Acceptance Model in a North American French Banking Environment

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Abstract

Nowadays banks are enhancing major objectives to challenge competition, competitiveness and growth. To comply with these new objectives they have developed new innovative channels of contacts and distribution of financial services to customers relying on the net: 'the Internet channel'. Based on the 'Technology Acceptance Model' this research will evaluate the impact of external latent variables 'Control', 'Innovation' and 'Enjoy' on the internal TAM model latent variables 'Ease of Use', 'Perceived Usefulness', 'Attitude towards Using' and 'Intention to Use' in a North American French Banking Environment. Results show a well structured model for on-line banking financial services that complies pretty well with all major criteria of structural equation modeling norms. The 'Control' latent variable has a significant effect on the TAM model latent variables 'Ease of Use and 'Attitude towards Using' while 'Innovation' has a sole impact on 'Intention to Use'. The 'Enjoy' latent variable has substantial impacts on 'Ease of Use', 'Attitude towards Using' and 'Intention to Use'.

Keywords: Technology Acceptance Model, on-line banking, Control, Innovation, Enjoy, Structural Equation Modeling

1. Introduction

Current usage and growth rates in the use of e-banking services in recent years (Fox, 2005) suggest that there is a huge potential in the offer of related Internet banking services in the unique French North American setting. This situation has been offset by the necessity to find out new ways of doing business, to increase revenues, control costs and improve the quality of service. On-line banking allows customers to do many banking operations (except

perhaps cashing money) through a telecommunication network without leaving one's home or business in a complete virtual environment (Lallmahamood, 2007; Legris, Ingham & Collerette, 2003; Mukherjee & Nath, 2003).

The services offered by Internet banking could include viewing all transactions and all accounts balances in real time, payment of bills, change of money in other currencies, transfers of money, stocks operations, purchase of all kind of insurances, purchase of travel tickets and travel packages, etc. (Ainin, Lim & Wee, 2005; Gerrard & Cunningham, 2003; Polatoglu & Ekin, 2001).

In a virtual environment two major factors should be taken into account when doing business. They are the risk of transactions and the confidence that customers could give to a virtual address. Customers who do not feel confident about a virtual address will not be loyal and will not do business with the bank even if they are satisfied (Lee, Kwon & Schumann, 2005; Gerrard & Cunningham, 2003; Anderson & Srinivasan, 2003).

The purpose of this research is to analyze the adoption of on-line banking services among people of Québec based on the Technology Acceptance Model (TAM) (Davis, 1989; Davis, Bagozzi & Warshaw, 1989, 1992; Mathieson, 1991) and the influence of external latent variables 'Control', 'Innovation' and 'Enjoy' on TAM latent dependent variables 'Ease of Use' (independent), 'Perceived Usefulness', 'Attitude towards Using' and 'Intention of Use'. These external latent variables are very important and many authors think they should be added to the TAM Model; as a matter of fact, we will add them as external variables to the core TAM Model and test them in a North American environment, particularly in the French financial environment.

2. Theoretical Background

2.1 The TAM Model Latent Variables

2.1.1 Ease of Use

The latent variable 'Ease of Use' is very important to acceptance of an information system because it is the basis of a system use (Davis et al., 1989). The perceived 'Ease of Use' refers to the degree to which the future user thinks that the system use will be effortless. A difficult system will be perceived as less useful by the user and will probably be abandoned (Davis, 1989).

All researches show evidence of significant effects of 'Ease of Use' perception on 'Intention to Use' directly or indirectly through 'Perceived Usefulness' and 'Attitude towards Using' (Venkatech & Bala, 2008; Wixom & Todd, 2005; Moon & Kim, 2001; Venkatesh & Morris, 2000). 'Ease of Use is a crucial factor for adopting and using services of on line banking (Gounaris & Koritos, 2008; Amin, 2007; Rigopoulos & Askounis, 2007). See hypothesis H1.

2.1.2 Perceived Usefulness

The TAM model is based on the Theory of Reasoned Action (TRA, Ajzen & Fishbein, 1975; Fishbein & Ajzen, 1980), which seeks to explain behaviour and the intention of using technology including those factors that influence the user. The intended behaviour is determined by 'Perceived Usefulness' influenced by the technology 'Ease of Use' and the attitude in using this technology. The 'Perceived Usefulness' is defined as the subjective probability that the user will increase its productivity using a specific application in its work. In turn this application will help them do a better job, more efficiently (Davis et al., 1989). See hypothesis H1.

2.1.3 Attitude towards Using

This latent variable is defined as the individual feeling towards behaviour objectives and realizations, It is a positive or negative feeling' evaluation. Nevertheless the bank customer's attitude towards new bank technologies has been extensively analysed in many researches because they determine which people are more able to adopt new electronic channels (McKechnie, Winklhofer & Ennew, 2006; Al Sukkar & Hassan, 2005). It has been demonstrated that user attitude has a strong, direct and positive effect on the real consumer intentions by using a new system or technology (Bobbitt & Dabholkar, 2001; Dishaw & Strong, 1999; Venkatech & Davis, 1996). In conclusion, customers with a more positive attitude to new technologies will be more motivated to use new bank on line products and financial services (Guerrero, Egea & Gonzalez, 2007). See hypothesis H2.

2.1.4 Intention to Use

The Theory of Reasoned Action (TRA) as well as the TAM model says that the use of technology is determined by the intention to have a particular behaviour, the intention to use a technology. The behaviour to use a technology could be predicted by measuring the intention and other factors influencing the user's behaviour (Davis et al., 1989). In the online banking context some authors confirm that there is a significant relation between 'Intention to Use' and the actual use of banking operations via the Internet (Walker & Johnson, 2006). See hypotheses H3 and H4.

2.2 The External Latent Variables to the TAM Model

2.2.1 Control

Control refers to the availability of resources, opportunities and knowledge to have a specific behaviour (Monsuwé, Dellaerty & Ruyter, 2004), the TAM model does not include the 'Control' latent variable but some authors suggest its inclusion (Venkatesh, 2000). Specifically, the internal control refers to the knowledge and self-efficiency to accomplish a task and the external control refers to the environment. It could be interpreted as availability of technology and necessary resources (including personnel) to perform duties (Taylor & Todd, 1995).

The internal control and self-efficiency is related to the 'Ease of Use' perception because the more you feel comfortable with computer manipulation and on-line banking operations, the higher the efficiency feeling (Dabholkar & Bagozzi, 2002). Bank operations using Internet could be a new difficult and process for many customers. Much like adding or changing some operations keys, this creates discomfort and thoughts that they have lost control on the process (Davis et al., 1989). Other authors have related self-efficiency with the latent variable 'Perceived Usefulness' (Reid & Levy, 2008; Venkatesh & Bala, 2008). See hypothesis H5, H6 and H7.

2.2.2 Enjoy

There is a multitude of empirical evidences on the importance of 'Enjoy' or 'Intrinsic Motivation' applied to the TAM Model (Venkatech & Bala, 2008). The 'Intrinsic Motivation' or 'Enjoy' comes from the experience itself and its consequences; this is more enjoyable because we experience the use of the computer and the technical system that we can control (Monsuwé et al., 2004). This brings to light the utilitarian and hedonic aspects that are considered crucial in the consumer's acceptance of a technology. Some people could be considered as problem solvers while others could be considered as seeking for fantasy, fun and sensorial excitement (Venkatech, 1999). The fun is a very important factor that has shown its influence in using computers and the Internet (Teo, Lim & Lai, 1999). It is related to people's perceived abilities and when these coincide with the perceived challenge, the user develops an intrinsic motivation or fun thus wanting to continue the activity. When the objectives are clear, our resources are at the challenge level and the feedback is immediate. We feel involved in the activity and intrinsically motivated. By the opposite, if the job requests abilities we don't have, work causes anxiety (Moon & Kim, 2001). See hypothesis H8, H10, H11.

2.2.3 Innovation

The most innovating people are those who can use a new technology despite its complexity and risks. Such people will challenge uncertainty. This construct can differentiate people who will use innovation and will be considered as innovators from those who do not. This construct is very stable in describing individuals with little variation in different situations and settings (Robinson, Marshall & Stamps, 2005).

Considering on line bank operations, some authors (Lassar, Manolis & Lassar, 2005) have surprisingly found that general innovation predisposition has a significant negative effect on the use of online banking. These authors explain this finding by stating that Internet banking is not an exciting innovation. See hypothesis H9.

3. Methodology

3.1 The Questionnaire

Data for this research stem from a questionnaire handed out to a convenience sample of full time students in a Quebec metropolitan Area University with 225 fully useful responses, including missing data, have been received.

The questionnaire is divided into 48 questions directly related to bank operations made by Internet and 10 general questions related to gender; age; level of education; social and personal questions; questions directly related to using the Internet and general questions related to Internet use and banking services. All respondents are at least 18 years old, have a bank account and make some too many bank operations using the Internet.

Insert Table 1 Here

In the table 2 we show the four TAM model latent variables 'Ease of Use', 'Perceived Utility', 'Attitude towards Use' and 'Intention of Use' used in our model as well as the observed variables all measured on a five points Likert Scale ranging from 'not agree at all' to 'completely agree'. The items or observed variables derive in part from a more extended questionnaire; these items have been directly adapted from the referenced literature and from the authors mentioned in the table 2. We used multi-item scales adapted to the suitability of the research, along with the fact that the instrument was translated into French and a prior confirmatory factor analysis was also performed. Some items were deleted on substantive and statistical grounds (Anderson and Gerbing, 1988), as the result only 20 items remained but all very significant for $p < 0.000$.

Insert Table 2 Here

The model is analyzed using Structural Equation Modeling; the original TAM model presents four latent variables, the 'Perceived Usefulness' using the Internet for banking operations, 'Attitude towards Use' of the Internet for banking operations and the 'Intention of use'. Three external latent variables: 'Control', 'Innovation' and 'Enjoy' were added to the model.

3.2 Validation of Scales

The measurement scales used in this research comply with all psychometric criteria established in the literature; in the TAM model, the latent variable 'Ease of Use' has been measured by three items, 'Perceived Usefulness' by four items, 'Attitude towards Use' by two items and the 'Intention of Use' by three items. As stated before, we had to add three external variables or dimensions, 'Control' measured by three items, 'Innovation' measured by three items and 'Enjoy' (enjoyment of use) measured by two items. Each item was measured on a five points' scale ranging from 'completely disagree' to 'completely agree'. The results obtained for the reliability analysis show that all Cronbach's Alpha for the latent variables are significant (Churchill, 1979) and superior to 0.70, like in table 6.

Before analyzing convergent and discriminant validity we proceeded to perform a confirmatory factor analysis (Table 3) with those latent variables appearing in figure 1. We kept only those loadings superior to 0.60 (except for Q44) (Hair, Anderson, Tatham & Black, 1999; Bagozzi & Baumgartner, 1994; Bagozzi & Yi, 1988).

Insert Table 3 Here

Table 4 shows that the confirmatory factor analysis model responds to the major acceptable criteria. Incremental indices CFI and the IFI are superior to 0.90 and the RMSEA is inferior to 0.09, so the model could be considered as significant.

Insert Table 4 Here

These tables allow us to confirm that the Critical ratios or Student T tests are very significant for $p < 0.05$ ($t > 1.96$) and that there is a significant convergent validity between the observed and the latent variables of the model.

The next stage will evaluate discriminant validity among factors to be sure that each factor (or latent variable) is specifically different of other factors. We can observe in table 5 that correlations between factors should not be superior to an 0.80 value which, is not the case for 'Ease of Use' (EU) and 'Control' (C) 0.903; 'Perceive Usefulness' (PU) and 'Attitude towards Use' (AU) 0.816 as well as on 'Intention of Use' 0.839; 'Attitude towards Use' (AU) and 'Intention to Use' (IU) 0.825. Usually the square root of the average variance extracted (AVE) should not be superior to the correlation between latent variables, thus rendering the correlation between 'Attitude towards Use' (AU) and 'Intention of Use' (0.825) acceptable because it is inferior to the AVE square root 0.915 (Fornell & Larcker, 1981). In conclusion, we can establish that there is substantial suspicion of lack of discriminant validity between 'Ease of Use' and 'Control' (0.761 vs. 0.903) and some between 'Perception Utility' with 'Intention of Use' (0.784 vs. 0.839) and 'Perception Utility' and 'Attitude towards Use' (0.784 vs. 0.816).

Insert Table 5 Here

The AVE figures in table 6 represent the extracted variance for each latent variable. They are superior to 0.50, which is usually recommended and accepted (Fornell & Larcker, 1981). The reliability and the Cronbach's alpha are superior to 0.70, which means that the instrument is indeed reliable.

Insert Table 6 Here

Traditional criteria were used to analyze the measurement of reliability and validity, Cronbach's alpha values and Average Variance Extracted measures provided evidence of measurement reliability (Fornell & Larcker 1981; Nunnally & Bernstein, 1994). The results indicate a reasonably good fit between the factor model and the observed data, the main fit indices are significant: Chi-square 359.145, ($df = 149$, $p<0.000$), the Comparative Fit Index (CFI) = 0.920, the Tucker Lewis Index (TLI) = 0.890 and the RMSEA = 0.079. (See Table 4).

In conclusion we can confirm that once tested, the scales comply with all psychometric properties established in the literature; in the next section, we will present the hypothesis the Model should test.

3.3 The TAM Model

Many versions of the TAM model have been used in different settings. We will adapt the general model for bank services offered on line. This new technology seems particularly suitable to the Internet operations for banking services (see figure 1). As previously stated we added three external latent variables to the TAM Model: 'Control', 'Innovation' and 'Enjoy'; next, we will test the following set of hypotheses:

3.3.1 Hypotheses Related to the TAM Model

H1. There is a significant positive relationship between the 'Ease of Use' and the 'Perceived Usefulness'.

H2. There is a significant positive relationship between the 'Perceived Usefulness' and 'Attitude towards Using'.

H3. There is a significant positive relationship between the 'Perceived Usefulness' and 'Intention to Use'.

H4. There is a significant positive relationship between 'Attitude towards Using' and 'Intention to Use'.

3.3.2 Hypothesis Involving External Variables

H5. There is a significant positive relationship between 'Control' and 'Ease of Use'.

H6. There is a significant positive relationship between 'Control' and 'Attitude towards Using'.

H7. There is a significant positive relationship between 'Control' and 'Intention to Use'.

H8. There is a significant positive relationship between 'Enjoy' and 'Ease of Use'.

H9. There is a significant positive relationship between 'Innovation' and 'Intention to Use'.

H10. There is a significant positive relationship between 'Enjoy' and 'Attitude towards Using'.

H11. There is a significant positive relationship between 'Enjoy' and 'Intention to Use'.

Insert Figure 1 Here

3.3.3 Results

3.3.3.1 The TAM Structural Model

The TAM structural model applied to online banking services offered in the province of Québec is highly significant. Table 7 shows that the Comparative Fit Index is superior to 0.90 as well as the Incremental Fit Index, the RMSEA is inferior to 0.09 and the confidence interval ranges from highly level of 0.069 to 0.09.

Insert Table 7 Here

The TAM model also has a high predictable capability. All R^2 displayed in Table 8 are superior to 0.50, the prediction strength increases with the introduction of the three external variables; comparing with the TAM basic model, the prediction increases 0.069 for 'Perceived Usefulness', 0.036 for 'Attitude towards Using' and 0.058 for 'Intention to Use'.

Insert Table 8 Here

3.3.3.2 Regression Weights and Measurement Model

Table 9 shows the standardized estimates for all relationships between latent variables in the structural model as well as loadings for all items on latent variables. All standardized regression weights are significant for $p<0.05$ (Student t or Critical Ratios are > 1.96), except for the relationship 'Control' → 'Intention to Use'. In figure 2 no relationships have been set up between 'Innovation' and 'Ease of Use', 'Innovation and 'Perceived Usefulness', 'Innovation' and 'Attitude towards Using' because these relations have been tested before and were not significant for $p<0.05$.

Insert Table 9 Here

Insert Figure 2 Here

4. Hypotheses Testing and Discussion

Table 10 shows the result of the hypothesis testing relative to the TAM Model. Hypotheses H1, H2, H3 and H4 are accepted and are perfectly significant and corroborate the nomological structure of the model.

The relationships 'Ease of Use' → 'Attitude towards Using' ($p=0.219$) as well as 'Ease of Use' →'Intention to Use' ($p=0.858$) have not been added because they are not significant to the model for $p < 0.05$.

The estimator value between 'Attitude towards Using' → 'intention of Use' without the direct relationship through 'Perceived Usefulness' to 'Intention to Use' should be 0.610 (significant for $p<0.05$) and significantly high in comparison to 0.297 (0.30 in Figure 2) if adding the direct relationship 'Perceived Usefulness' →'Intention to Use' in the model.

As was said before the only external variable relationship to the TAM model which is not significant is 'Control' →'Intention to Use'; this hypothesis is rejected, all the others are accepted.

Insert Table 10 Here

Understandably, the 'Control' external variable seems to have the most important impact on 'Ease of Use', but this variable does not have a significant impact on 'intention to Use'. This means that on-line banking use is easy, but it does not imply that customers will use it to buy financial services. There are many reasons for not using on-line banking even among users that control it well (security, confidence, risk, etc.).

The external variable 'Enjoy' reflects more a behaviour than an attitude and the correlation with 'Control' is very high (0.63); the relation between 'Control' and 'Intention to Use' could be indirectly mediating through the variables 'Innovation' or 'Enjoy'. In turn, external Variables 'Innovation' and 'Enjoy' have a substantial and a significant impact on 'Intention to Use' to justify the introduction of these variables in the model. Another major reason to adopt the TAM Model with the three external variables is due to the fact that there is a substantial and significant increase in the model predictability (table 8) for using on line banking.

In conclusion, our model integrates all latent variables of the TAM original Model; they are all very significant and the TAM Model could easily be applied to analyze the adoption of on line banking in a French environment in North America (Davis et al., 1989).

4.1 Limitations

This research has some limitations; the first one could be the sample selection, which is made up of university students with proven abilities in computer manipulation, banking account(s) experience in the use of on-line banking. These people are very opened to new technologies; they enjoy and in majority prefer to have an Internet connection with their bank. For these reasons they think they have a reasonable control over on-line banking operations in the Internet. It would be interesting to see if similar results would be obtained with other subjects.

4.2 Management Implications

To attract people and new users to online banking, banks and credit unions should offer a complete selection of financial services based on perceived usefulness and not only with an easy system to manipulate. Banks and credit unions should offer the same utility completing the financial services in Internet at the same level than those they offer at the branch. Banks should differentiate the products they offer from those of their competitors' and this differentiation will not come from technology or product complexity but from innovation and creativity.

A common problem with on line banking is to lose the financial counselling you normally get when going to the bank. For this reason it is important for the user-customer to have an easy access to direct help through special phone numbers for either customer support, chat opportunity, or customer e-mail help and support as well as develop all channels of interaction between branch and its users.

Banks in Canada are trying to start direct communication with their customers through special e-mail accounts they give to their customers; some countries are using Facebook and Twitter as communication channels in both directions for communicating news, offering new products, financial counselling and even the management of customer' complaints. This way of doing things through social networks seems to be much appreciated in some European countries.

5. Conclusion

The TAM model is strongly supported in a French North American banking (more specifically in Québec), the influence of the 'Perceived usefulness' on 'Attitude towards using' is very strong as well as the 'Attitude towards using' on the 'Intention of use'.

Our findings have significant meaning to encourage population of Québec (and by the way in French Canada) to use the Internet for making all their personal banking operations in a secure, easy and self-efficient way. All Canadian banks or Credit Unions operating in the province of Québec should be encouraged to continue investing and developing services offered via the net and complete the financial services offered by chat, e-mails, telephone, Internet, on line help and all other means enhancing and accelerating communication.

In conclusion to attract customers, banks should offer the same financial services via the Internet that they offer at the branch, this is beneficial for the customer and for the control of bank costs (Wang, Wang, Lin & Tang, 2003).

References

Agarwal, R., & Prasad, J. (1998). The antecedents and consequents of user perceptions in information technology adoption. *Decision Support Systems*, 22(1), 15-29. http://dx.doi.org/10.1016/S0167-9236(97)00006-7

Ainin, S., Lim, C.H., & Wee, A. (2005). Prospects and Challenges of e-banking in Malaysia. *The Electronic Journal of Information Systems in Developing Countries*, 22(1), 1-11.

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall Inc.

Akinci, S., Aksoy, S., & Atilgan, E. (2004). Adoption of Internet banking among sophisticated consumer segments in an advanced developing country. *The International Journal of Bank Marketing*, 22(2/3), 212-232. http://dx.doi.org/10.1108/02652320410530322

Al Sukkar, A., & Hasan, H. (2005). Toward a model for the acceptance of Internet banking in developing countries. *Information Technology for Development*, 11(4), 381-398. http://dx.doi.org/10.1002/itdj.20026

Amin, H. (2007). Internet banking adoption among young intellectuals. *Journal of Internet Banking and Commerce*, 12(3), 1-14.

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: a review and recommended two-step approach. *Psychological Bulletin*, 103(3), 411-423. http://dx.doi.org/10.1037/0033-2909.103.3.411

Anderson, R. E., & Srinivasan, S. S. (2003). E-satisfaction and E-Loyalty: A Contingency Framework, *Psychology and Marketing*, 20(2), 123-138. http://dx.doi.org/10.1002/mar.10063

Bagozzi, R. P., & Baumgartner, H. (1994). The evaluation of structural equation models and hypothesis testing. In R. P. Bagozzi (Ed.), *Principles of marketing research*, (pp. 386-424). Cambridge, MA: Basil Blackwell.

Bagozzi, R. P., & Yi, Y. (1988). On the Evaluation of Structural Equation Models, *Journal of the Academy of Marketing Science*, 16 (Spring), 74-94.

Bobbitt, L. M., & Dabholkar, P. A. (2001). Integrating attitudinal theories to understand and predict use of technology-based self-service: The Internet as an illustration. *International Journal of Service Industry Management*, 12(5), 423-450. http://dx.doi.org/10.1108/EUM0000000006092

Brown, I., Hoppe, R., Mugera, P., Newman, P., & Stander, A. (2004). The Impact of National Environment on the Adoption of Internet Banking: Comparing Singapore and South Africa. *Journal of Global Information Management*, 12(2), 1-26. http://dx.doi.org/10.4018/jgim.2004040101

Chan, S.-C., & Lu, M.-t. (2004). Understanding Internet Banking Adoption and Use Behaviour: A Hong Kong Perspective. *Journal of Global Information Management*, 12(3), 21-43. http://dx.doi.org/10.4018/jgim.2004070102

Chau, P. Y. K., & Hu, P. J.-H. (2002). Investigating healthcare professionals' decisions to accept telemedicine technology: an empirical test of competing theories. *Information & Management*, 39(4), 297-311. http://dx.doi.org/10.1016/S0378-7206(01)00098-2

Chen, L. D., Gillenson, M. L., & Sherrell, D. L. (2002). Enticing online consumers: an extended technology acceptance perspective. *Information & Management*, 39(8), 705-719. http://dx.doi.org/10.1016/S0378-7206(01)00127-6

Childers, T. L., Carr, C. L., Peck, J., & Carson, S. (2001). Hedonic and utilitarian motivations for online retail shopping behavior. *Journal of Retailing*, 77(4), 511-535. http://dx.doi.org/10.1016/S0022-4359(01)00056-2

Churchill, G. (1979). A Paradigm for Developing Better Measures of Marketing Constructs. *Journal of Marketing Research*, 16, 64-73.

Dabholkar, P. A., & Bagozzi, R. P. (2002). An Attitudinal Model of Technology-Based Self-Service: Moderating Effects of Consumer Traits and Situational Factors. *Journal of the Academy of Marketing Science*, 30(3), 184-201.

Davis, F. D. (1986). *Technology Acceptance Model for Empirically Testing New End-User Information Systems: Theory and Results*. Unpublished Doctoral Dissertation, Massachusetts Institute of Technology, Boston, MA.

Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use and User Acceptance of Information Technology. *MIS Quarterly*, 13(3), (September), 319-340.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User Acceptance Of Computer Technology: A Comparison Of Two Theoretical Models. *Management Science*, 35(8), 982-1004.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1992). Extrinsic and Intrinsic Motivation to Use Computers in the Workplace. *Journal of Social Psychology, 22 (14), 1111-1132.*

Dishaw, M. T., & Strong, D. M. (1999). Extending the technology acceptance model with task–technology fit constructs. *Information & Management*, 36(1), 9-21.

Fishbein, M., & Ajzen, I. (1975). *Belief, Attitude, Intention and Behaviour: An Introduction to Theory and Research*. Reading, MA: Addison-Wesley.

Fornell, C., & Larcker, F. D. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39-50.

Fox, S. (2005). The state of online banking: *PEW Internet & American Life Project*.

Gerrard, P., & Cunningham, J. B. (2003). The diffusion of Internet banking among Singapore consumers. *International Journal of Bank Marketing*, 21(1), 16-28. http://dx.doi.org/10.1108/02652320310457776

Gounaris, S., & Koritos, C. (2008). Investigating the drivers of Internet banking adoption decision: A comparison of three alternative frameworks. *International Journal of Bank Marketing*, 26(5), 282-304. http://dx.doi.org/10.1108/02652320810894370

Guerrero, M. M., Egea, J. M. O., & González, M. V. R. (2007). Application of the latent class regression technique to the analysis of Internet use for banking operations in the European Union. *Journal of Business Research*, 2(2), 137-145.

Hair, J. F., Anderson, R., Tatham, R. L., & Black, W. (1999). *Análisis multivariante*. Madrid: Prentice Hall.

Klopping, I. M., & McKinney, E. (2004). Extending the technology acceptance model and the task-technology fit model to consumer e-commerce. *Information Technology, Learning, and Performance Journal*, 22(1), 35-48.

Lallmahamood, M. (2007). An examination of individual's perceived security and privacy of the Internet in Malaysia and the influence of this on their intention to use e-commerce: Using an extension of the Technology Acceptance Model. *Journal of Internet Banking and Commerce, 12*(3), 1-26.

Lassar, W. M., Manolis, C., & Lassar, S. S. (2005). The relationship between consumer innovativeness, personal characteristics, and online banking adoption. *International Journal of Bank Marketing*, 23(2), 179-199. http://dx.doi.org/10.1108/02652320510584403

Lee, E.-J., Kwon, K.-N., & Schumann, D. W. (2005). Segmenting the non-adopter category in the diffusion of Internet banking. *International Journal of Bank Marketing*, 23(5), 414-437. http://dx.doi.org/10.1108/02652320510612483

Legris, P., Ingham, J., & Collerette P. (2003). Why do people use information technology? A critical review of the technology acceptance model, *Information & Management*, 40(3), 191-204. http://dx.doi.org/10.1016/S0378-7206(01)00143-4

Lu, H., & Lin, J. C.-C. (2002). Predicting customer behavior in the market-space: a study of Rayport and Sviokla's framework. *Information & Management*, 40(1), 1-10. http://dx.doi.org/10.1016/S0378-7206(01)00131-8

Mathieson, K. (1991). Predicting user intentions: comparing the technology acceptance model with the theory of planned behavior. *Information Systems Research*, 2(3), 173-191. http://dx.doi.org/10.1287/isre.2.3.173

McKechnie, S., Winklhofer, H., & Ennew, C. (2006). Applying the technology acceptance model to the online retailing of financial services. *International Journal of Retail & Distribution Management*, 34(4/5), 388-410. http://dx.doi.org/10.1108/09590550610660297

Monsuwé, T. P., Dellaert, B. G. C. & Ruyter, K. d. (2004). What drives consumers to shop online? A literature review. *International Journal of Service Industry Management*, 15(1), 102-121. http://dx.doi.org/10.1108/09564230410523358

Moon, J.-W., & Kim, Y.-G. (2001). Extending the TAM for a World-Wide-Web context. *Information & Management*, 38(4), 217-230. http://dx.doi.org/10.1016/S0378-7206(00)00061-6

Morris, M. G., & Venkatesh, V. (2000). Age differences in technology adoption decisions: Implications for a changing work force. *Personnel Psychology*, 53(2), 375-403. http://dx.doi.org/10.1111/j.1744-6570.2000.tb00206.x

Mukherjee, A., & Nath, P. (2003). A model of trust in online relationship banking. *International Journal of Bank Marketing*, 21(1), 5-15. http://dx.doi.org/10.1108/02652320310457767

Nunnally, J. C. & Bernstein, I. H. (1994). *Psychometric theory,* 3e éd. New York: McGraw-Hill.

O'Cass, A., & Fenech, T. (2003). Web retailing adoption: exploring the nature of Internet users Web retailing behaviour. *Journal of Retailing and Consumer Services*, 10(2), 81-94. http://dx.doi.org/10.1016/S0969-6989(02)00004-8

Pavlou, P. A. (2003). Consumer Acceptance of Electronic Commerce: Integrating Trust and Risk with the Technology Acceptance Model. *International Journal of Electronic Commerce*, 7(3), 101 - 134.

Pikkarainen, T., Pikkarainen, K., Karjaluoto, H., & Pahnila, S. (2004). Consumer acceptance of online banking: an extension of the technology acceptance model. *Internet Research: Electronic Networking Applications and Policy*, 14(3), 224-235. http://dx.doi.org/10.1108/10662240410542652

Polatoglu, V. N., & Ekin, S. (2001). An empirical investigation of the Turkish consumers' acceptance of Internet banking services. *International Journal of Bank Marketing*, 19(4/5), 156-165. http://dx.doi.org/10.1108/02652320110392527

Reid, M., & Levy, Y. (2008). Integrating trust and computer self-efficacy with TAM: An empirical assessment of customers' acceptance of banking information systems (BIS) in Jamaica. *Journal of Internet Banking and Commerce*, 12(3), 1-17.

Rigopoulos, G., & Askounis, D. (2007). A TAM framework to evaluate users' perception towards online electronic payments. *Journal of Internet Banking and Commerce*, 12(3), 1-6.

Robinson, L., Marshall, G. W. J., & Stamps, M. B. (2005). Sales force use of technology: antecedents to technology acceptance. *Journal of Business Research*, 58(12), 1623-1631. http://dx.doi.org/10.1016/j.jbusres.2004.07.010

Taylor, S., & Todd, P. (1995). Decomposition and crossover effects in the theory of planned behavior: A study of consumer adoption intentions. *International Journal of Research in Marketing*, 12(2), 137-155. http://dx.doi.org/10.1016/0167-8116(94)00019-K

Teo, T. S. H., Lim, V. K. G., & Lai, R. Y. C. (1999). Intrinsic and extrinsic motivation in Internet usage. *International Journal of Information Management*, 27(1), 25-37.

Venkatesh, V. (1999). Creation of favorable user perceptions: Exploring the role of intrinsic motivation. *MIS Quarterly*, 23(2), 239-260. http://dx.doi.org/10.2307/249753

Venkatesh, V. (2000). Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the technology acceptance model. *Information Systems Research*, 11(4), 342-365. http://dx.doi.org/10.1287/isre.11.4.342.11872

Venkatesh, V., & Bala, H. (2008). Technology Acceptance Model 3 and a Research Agenda on Interventions. *Decision Sciences*, 39(2), 273-315. http://dx.doi.org/10.1111/j.1540-5915.2008.00192.x

Venkatesh, V., & Davis, F. D. (1996). A model of the antecedents of perceived ease of use: Development and test. *Decision Sciences*, 27(3), 451-481. http://dx.doi.org/10.1111/j.1540-5915.1996.tb01822.x

Venkatesh, V., & Morris, M. G. (2000). Why don't men ever stop to ask for directions? Gender, social influence, and their role in technology acceptance and usage behaviour. *MIS Quarterly*, 24(1), 115-139. http://dx.doi.org/10.2307/3250981

Venkatesh, V., Speier, C., & Morris, M. G. (2002). User acceptance enablers in individual decision making about technology: Toward an integrated model. *Decision Sciences*, 33(2), 297-316. http://dx.doi.org/10.1111/j.1540-5915.2002.tb01646.x

Walker, R. H., & Johnson, L. W. (2006). Why consumers use and do not use technology-enabled services. *Journal of Services Marketing*, 20(2), 125-135. http://dx.doi.org/10.1108/08876040610657057

Wang, Y.-S., Wang, Y.-M., Lin, H.-H., & Tang, T.-I. (2003). Determinants of user acceptance of Internet banking: an empirical study. *International Journal of Service Industry Management*, 14(5), 501-519. http://dx.doi.org/10.1108/09564230310500192

Wixom, B. H., & Todd, P. A. (2005). A theoretical integration of user satisfaction and technology acceptance. *Information Systems Research*, 16(1), 85-102. http://dx.doi.org/10.1287/isre.1050.0042

Table 1. Sample Description

Universe	People using Internet for bank operations
Sample	People with a bank account using on-line banking services
Regional Area	Ottawa-Gatineau area
Data Collect Method	Direct questionnaire
Sample Size	225 useful questionnaires
Collection Period	September-November 2010

Table 2. Items in the Questionnaire

Items in the questionnaire	
Items (in French)	**Adapted from**
Attitude towards using	
5. Utiliser les services bancaires par Internet est une bonne idée.	(Chau & Hu, 2002; Klopping & McKinney, 2004; Morris & Venkatesh, 2000; O'Cass y Fenech, 2003; Reid & Levy, 2008; Robinson et al., 2005)
6. En général, mon attitude sur l'usage des services bancaires par Internet est positive.	(Lu & Lin, 2002)
Control	
14. J'ai un bon contrôle des opérations bancaires par Internet.	(Chau & Hu, 2002)
15. J'ai les connaissances informatiques nécessaires pour utiliser les services bancaires par Internet.	(Chau & Hu, 2002; Morris & Venkatesh, 2000; Venkatesh, 2000)
16. J'ai les connaissances financières nécessaires pour utiliser les services bancaires par Internet.	(Chau & Hu, 2002; Morris & Venkatesh, 2000; Venkatesh, 2000)
Enjoy/pleasure (Intrinsic Motivation)	
22. L'usage des services bancaires par Internet est amusant.	(Childers, Carr, Peck & Carson, 2001; Pikkarainen, Pikkarainen, Karjaluoto & Pahnila, 2004; Venkatesh, 2000; Venkatesh, Speier & Morris, 2002)
23. L'usage des services .bancaires par Internet est agréable.	(O'Cass & Fenech, 2003; Pikkarainen, et al., 2004; Venkatesh, 2000; Venkatesh & Bala, 2008; Venkatesh, et al., 2002)
Ease of Use	
24. Il est facile que les services bancaires fassent ce que je désire qu'ils fassent.	(Agarwal & Prasad, 1998; Chan & Lu, 2004; Chen, Gillenson y Sherrell, 2002; Davis, 1989; Pikkarainen, et al., 2004; Robinson, Marshall & Stamps, 2005; Venkatesh, 2000; Venkatesh & Bala, 2008; Venkatesh & Davis, 1996, 2000; Venkatesh & Morris, 2000; Venkatesh, et al., 2002)
25. Les services bancaires par Internet sont clairs et compréhensibles.	(Agarwal & Prasad, 1998; Chen, et al., 2002; Davis, 1989; Pavlou, 2003; Pikkarainen, Pikkarainen, et al., 2004; Reid & Levy, 2008; Robinson, Marshall & Stamps, 2005; Venkatesh, 2000; Venkatesh & Bala, 2008; Venkatesh & Davis, 1996, 2000; Venkatesh & Morris, 2000; Venkatesh, et al., 2002; Wang, et al., 2003)
26. Les services bancaires par Internet sont d'un usage facile.	(Brown, et al., 2004; Chan & Lu, 2004; Chen, et al., 2002; Davis, 1989; O'Cass & Fenech, 2003; Pavlou, 2003; Pikkarainen, et al., 2004; Robinson, et al., 2005; Venkatesh & Bala, 2008; Venkatesh & Davis, 1996, 2000; Venkatesh & Morris, 2000; Venkatesh, et al., 2002; Wang, et al., 2003)
Intention to use	
31. Si j'avais accès aux services bancaires par Internet je les utiliserais.	(Agarwal & Prasad, 1998; Chen, et al, 2002; Pavlou, 2003; Robinson, et al., 2005; Venkatesh, 2000; Venkatesh & Davis, 1996, 2000; Venkatesh & Morris, 2000; Venkatesh, et al., 2002; Wang, et al., 2003)
32. Je veux utiliser les services bancaires par Internet plutôt que d'effectuer mes opérations au comptoir de la banque.	(Agarwal & Prasad, 1998)
33. J'ai l'intention dans l'avenir d'augmenter mon usage des services bancaires par Internet.	(Chau & Hu, 2002; Lu & Lin, 2002; Pavlou, 2003; Reid & Levy, 2008; Wang, et al., 2003)
Innovation	
42. Mes amis et mes camarades de travail me considèrent comme une bonne source d'information et de conseils pour Internet.	(Lassar, Manolis & Lassar, 2005; O'Cass & Fenech, 2003)
43 Mes amis et mes camarades de travail me demandent des conseils sur Internet et les pages web à visiter.	(Lassar, et al., 2005; O'Cass & Fenech, 2003)
44. Habituellement j'aime essayer de nouveaux produits.	(Agarwal & Prasad, 1998; Robinson, et al., 2005)

Perceived Usefulness	
45. Effectuer des opérations bancaires par Internet permet d'économiser du temps.	(Chen, et al., 2002; Davis, 1989)
46. Je trouve que les services bancaires offerts sur Internet sont utiles.	(Brown, et al., 2004; Chau & Hu, 2002; Chen, Gillenson & Sherrell, 2002; Davis, 1989; Klopping & McKinney, 2004; O'Cass & Fenech, 2003; Pavlou, 2003; Reid & Levy, 2008; Robinson, et al., 2005; Venkatesh, 2000; Venkatesh & Bala, 2008; Venkatesh and Davis, 1996, 2000; Venkatesh & Morris, 2000; Venkatesh, et al., 2002; Wang, et al., 2003)
47. Les services bancaires par Internet me permettent de gérer mes finances plus efficacement.	(Agarwal & Prasad, 1998; Brown et al., 2004; Chan & Lu, 2004; Chau & Hu, 2002; Chen, Gillenson & Sherrell, 2002; Davis, 1989; O'Cass & Fenech, 2003; Pikkarainen, et al., 2004; Reid & Levy, 2008; Robinson, et al., 2005; Venkatesh, 2000; Venkatesh & Bala, 2008; Venkatesh & Davis, 2000; Venkatesh & Morris, 2000; Venkatesh, et al., 2002)
48. La plupart des opérations bancaires que j'ai besoin d'effectuer sont disponibles en services bancaires par Internet.	(Akinci, Aksoy & Atilgan, 2004)

Table 3. Standardized Regression Weights for the Confirmatory Model

		Estimate	S.E.	C.R.	p
Q45_SBI_permet_économiser_temps	<--- Perceived Utility	0.782			
Q46_Je_trouve_SBI_utiles	<--- Perceived Utility	0.898	.096	14.535	***
Q47_SBI_permet_gérer_finances_personnelles_efficacement	<--- Perceived Utility	0.770	.127	12.137	***
Q6_Attitude_positive_sur_SBI	<--- Attitude towars use	0.931			
Q5_SBI_bonne_idée	<--- Attitude towars use	0.902	.044	20.614	***
Q31_Si_avais_accès_aux_SBI_je_les_utiliserais	<--- Intention of use	0.751			
Q32_Veut_utiliser_SBI_plutôt_que_comptoir	<--- Intention of use	0.776	.094	11.306	***
Q33_Intention_augmenter_usage_SBI	<--- Intention of use	0.789	.092	11.531	***
Q26_Usage_facile	<--- Easiness of Use	0.776	.101	10.036	***
Q25_SBI_clairs_compréhensibles	<--- Easiness of Use	0.830	.099	11.083	***
Q24_Usage_SBI_fait_ce_que_je_veux_pour_moi	<--- Easiness of Use	0.711			
Q16_Ai_connaissances_financières_pour_SBI	<--- Control	0.720	.101	10.554	***
Q15_Ai_connaissances_informatiques_pour_SBI	<--- Control	0.707	.085	10.330	***
Q14_Bon_contrôle_des_opérations_SBI	<--- Control	0.769			
Q42_Suis_source_information_conseil_pour_Internet	<--- Innovation	0.858			
Q43_Amis_me_demandent_conseil_pour_Internet	<--- Innovation	0.851	.109	9.709	***
Q44_J_aime_essayer_nouveaux_produits	<--- Innovation	0.489	.075	6.865	***
Q23_Usage_SBI_agréable	<--- Enjoy	0.952			
Q22_Usage_SBI_amusant	<--- Enjoy	0.743	.077	11.752	***
Q48_Plupart_opérations_bancaires_SBI_disponibles	<--- Perceived Utility	0.660	.112	10.073	***

Table 4. Confirmatory Model Fit

Chi-Square	**Degrees of Freedom**	**Probability**	**NFI**	**IFI**	**CFI**	**RMSEA**
359.145	149	0.000	0.876	0.924	0.922	0.079

Table 5. Correlation between Latent Variables for the TAM Model. In Diagonal the AVE Square Roots

Latent Variables	EU Easiness of Use	PU Perception Utility	AU Attitude towards Use	IU Intention of Use	C Control	I Innovation	E Enjoy
EU	**0.761**						
PU	0.691	**0.784**					
AU	0.654	0.816	**0.915**				
IU	0.650	0.839	0.825	**0.772**			
C	0.903	0.703	0.732	0.652	**0.732**		
I	0.290	0.256	0.191	0.315	0.345	**0.752**	
E	0.638	0.630	0.699	0.760	0.637	0.227	**0.853**

Table 6. Reliability Measures and Average Extracted Variance

Latent Variables	Cronbach's Alpha	Reliability	AVE
EU	0.795	0.805	0.580
PU	0.846	0.862	0.615
AU	0.795	0.918	0.839
IU	0.818	0.816	0.596
C	0.781	0.776	0.536
I	0.766	0.788	0.566
E	0.819	0.841	0.728

Table 7. Fit Indices for the TAM Model with External Variables

Chi-Square	Degrees of Freedom	Probability	NFI	IFI	CFI	TLI	RMSEA
375.736	156	0.000	0.870	0.920	0.918	0.889	0.079

Table 8. Capability of Prediction for the Basic TAM Model Versus the TAM Model with External Variables

Latent Variables	Ease of Use	Perceived Usefulness	Attitude towards Using	Intention to Use
R^2 for the TAM Model with the three external variables	0.876	0.564	0.727	0.821
R^2 for the basic TAM Model without external variables	-	0.495	0.691	0.763

Table 9. Standardized Regression Weights with Standard Errors. Student T and Probability for the TAM Model

			Estimate	S.E.	C.R.	p
Ease of Use	<---	Control	.786	.104	7.587	***
Ease of Use	<---	Enjoy	.214	.060	2.781	.005
Perceived Usefulness	<---	Ease of Use	.751	.062	8.928	***
Attitude towards use	<---	Perceived Usefulness	.543	.131	6.884	***
Attitude towards use	<---	Control	.156	.105	1.813	.070
Attitude towards use	<---	Enjoy	.273	.065	4.059	***
Intention to use	<---	Attitude towards use	.297	.105	2.664	.008
Intention to use	<---	Control	-.142	.111	-1.476	.140
Intention to use	<---	Perceived Usefulness	.466	.169	4.323	***
Intention to use	<---	Enjoy	.342	.075	4.079	***
Intention to use	<---	Innovation	.118	.044	2.164	.030
Q45_SBI_permet_économiser_temps	<---	Perceived Usefulness	.787			
Q46_Je_trouve_SBI_utiles	<---	Perceived Usefulness	.897	.094	14.615	***
Q47_SBI_permet_gérer_finances_personnelles_efficacement	<---	Perceived Usefulness	.768	.126	12.158	***
Q6_Attitude_positive_sur_SBI	<---	Attitude towards use	.932			
Q5_SBI_bonne_idée	<---	Attitude towards use	.903	.045	20.223	***
Q31_Si_avais_accès_aux_SBI_je_les_utiliserais	<---	Intention to use	.898			
Q32_Veux_utiliser_SBI_plutôt_que_comptoir	<---	Intention to use	.747	.095	11.102	***
Q33_Intention_augmenter_usage_SBI	<---	Intention to use	.771	.094	11.325	***
Q26_Usage_facile	<---	Ease of Use	.785	.094	10.021	***
Q25_SBI_clairs_compréhensibles	<---	Ease of Use	.708	.091	11.106	***
Q24_Usage_SBI_fait_ce_que_je_veux_pour_moi	<---	Ease of Use	.783			
Q16_Ai_connaissances_financières_pour_SBI	<---	Control	.730	.105	10.505	***
Q15_Ai_connaissances_informatiques_pour_SBI	<---	Control	.735	.089	10.292	***
Q14_Bon_contrôle_des_opérations_SBI	<---	Control	.721			
Q42_Suis_source_information_conseil_pour_Internet	<---	Innovation	.758			
Q43_Amis_me_demandent_conseil_pour_Internet	<---	Innovation	.865	.108	9.624	***
Q44_J_aime_essayer_nouveaux_produits	<---	Innovation	.845	.075	6.779	***
Q23_Usage_SBI_agréable	<---	Enjoy	.951			
Q22_Usage_SBI_amusant	<---	Enjoy	.744	.078	11.660	***
Q48_Plupart_opérations_bancaires_SBI_disponibles	<---	Perceived Usefulness	.659	.111	10.102	***

Table 10. Hypothesis Tested and Acceptation

H1	Ease of Use → Perceived Usefulness	075	accepted
H2	Perceived Usefulness → Attitude towards Using	0.54	accepted
H3	Perceived Usefulness →Intention to Use	0.47	accepted
H4	Attitude towards Using → Intention to Use	0.30	accepted
H5	Control → Ease of Use	0.79	accepted
H6	Control → Attitude towards Using	0.16	accepted
H7	Control → Intention to Use	-0.14	rejected
H8	Enjoy → Ease of Use	0.21	accepted
H9	Innovation → Intention to Use	0.12	accepted
H10	Enjoy → Attitude towards Using	0.28	accepted
H11	Enjoy → Intention to Use	0.34	accepted

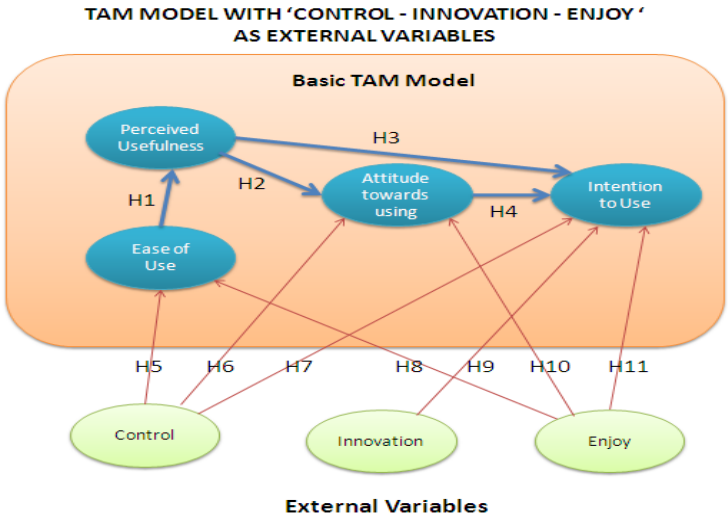

Figure 1. TAM Model and External Variables Hypotheses

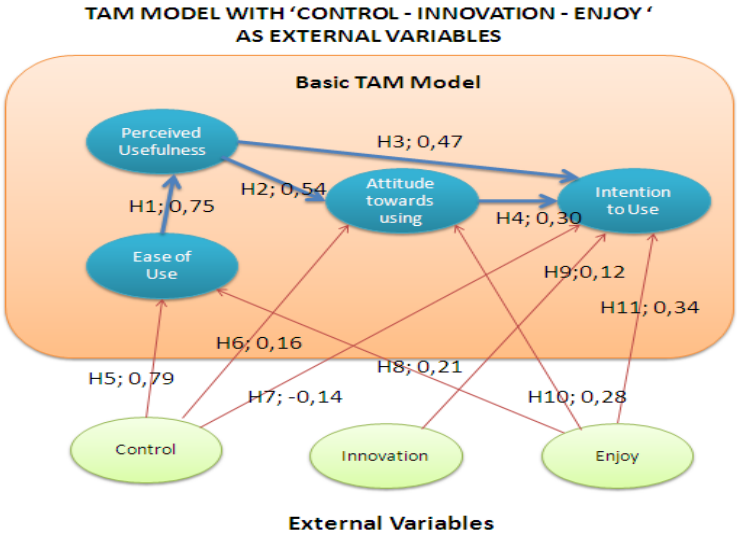

Figure 2. TAM Model and External Variables Hypotheses Tested

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Strategic Groups Structure, Positioning of the Firm and Performance: A Review of Literature

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Abstract

A central theme of the literature on strategic groups is that group membership affects performance. The basic premise of strategic groups and their main interest is in fact that performance can be attributed to strategic groups and not only to the idiosyncratic character of the individual firm. The aim of this paper is therefore to characterize and synthesize studies that examined the relationship between strategic groups, considered from the economic or cognitive perspectives, and performance. We notice that these studies have often yielded conflicting results. We will focus specifically on the relationship between the positioning of the firm, the strategic group and performance, a link that has hitherto been little studied in the literature. In other words, is there for the firm an optimal positioning in relation to strategic groups in its industry? The few empirical studies focusing on this relationship, emphasizing a cognitive approach, were able to show that firms moderately differentiated with respect to their belonging strategic group are more successful.

Keywords: Strategic groups, Performance, Competitive positioning, Legitimacy, Differentiation

A central theme of the literature on strategic groups is that group membership has an impact on performance (Cool & Schendel, 1987; Hodgkinson, 1997a). The basic premise of strategic groups and their main interest are in fact that performance can be attributed to strategic groups and not only to the idiosyncratic character of the individual firm.

There is no formal definition of the concept of strategic group unanimously accepted (Thomas & Venkatraman, 1988: 538). Hunt (1972), who was the first to formulate this concept, observed significant differences in the strategies followed by firms in the U.S. home appliance industry, even though many of them were pursuing similar strategies. Business combinations can therefore, according to this author, facilitate the identification of different types of generic strategies followed. Hunt therefore defined a strategic group as a group of companies within a sector, which are very similar in terms of cost structure, degree of product diversification, formal organization, control systems and perceptions and preferences of individuals.

Subsequently, many other definitions of strategic groups have been proposed. According to Porter (1979: 215): "An industry [...] can be considered as composed of groups of firms, each group consisting of firms pursuing similar strategies regarding key decision variables". The definition of Porter (1980: 129) is certainly the most commonly used: "A strategic group is a group of firms in an industry following a similar or identical strategy regarding relevant

dimensions. An industry may have a single strategic group if all firms follow essentially the same strategy. At another extreme, each firm could be a different strategic group. However, there are usually a small number of strategic groups, summarizing the essential strategic differences among firms in an industry."

Thus, in general, the concept of strategic group is defined in terms of a group of companies pursuing similar strategies with similar resources (Yami & Benavent, 2000: 3).

The aim of this paper is therefore to compile a literature review on the relationship between performance and strategic groups, showing that different works sometimes led to conflicting results. We will also try to identify new perspectives in this area of research, especially by focusing on the theory of strategic balance formulated by Deephouse (1999). This review of the literature should therefore allow us to propose an empirical test and could deepen the theory proposed by Deephouse.

Two research streams studied largely independently the strategic group concept, the first being derived specifically from the industrial economy and the second from the cognitive approach to strategy. We will see in the first section that these two approaches could be reconciled in order to achieve more conclusive results regarding the link between strategic group and performance. In a second part, we will focus on strategic groups' performance, by describing the factors that explain performance differences between groups and within groups. In the third part, we will analyze the research about the different positions of the firm relative to strategic groups. Finally, in a fourth part we will discuss the theory of strategic balance, which applied to strategic groups helps explain the link between the positioning of the firm relative to the strategic group and performance.

1. Strategic Groups and Performance: The Interest of Reconciling the Economic and Cognitive Perspectives

Research on strategic groups has not yet succeeded in proving the existence of a genuine link between strategic group membership and performance. While the "objective" approach has produced conflicting results, the cognitive approach insufficiently explored this question. Nowadays, as both economic and cognitive factors are likely to affect performance, a third perspective that integrates these two approaches seems likely to clarify this issue.

1.1 "Objective" Strategic Groups and Performance

Numerous studies have focused on strategic groups since the 1970s, some authors having proposed a synthesis of these studies (e.g. Ketchen et al., 2004). A wave of criticism on the "objective" approach to strategic groups is the lack of results demonstrating real performance variations between groups (Mehra & Floyd, 1998: 512; Yami & Benavent, 2000: 2). It was indeed assumed in theory that performance was relatively homogeneous within groups, the greater heterogeneity of performance being found between the various strategic groups (Thomas & Pollock, 1999: 131). Going against this proposal, it was found that firms belonging to the same strategic group could hold very significant performance differences (Fiegenbaum & Thomas, 1990 Thomas & Venkatraman, 1988). The performance of the firm would not thereby be explained by its strategic group membership (Barney & Hoskisson, 1990: 187). In addition, performance is generally considered in the studies on strategic groups in the narrow terms of profitability, thus opposing a broader view including financial and operational measures (Peteraf & Shanley, 1997).

1.2 Cognitive Strategic Groups and Performance

Very few studies have attempted to link, at the theoretical or empirical levels, cognitive strategic groups with performance. Peteraf and Shanley (1997), however, by proposing an identity theory of cognitive strategic groups, suggested that the homogeneity of perceptions within the same strategic group could have negative and positive effects on intermediate performance variables such as reactivity or strategic cooperation. They argue that such contradictory effects may explain the absence of significant performance differences between cognitive strategic groups.

Reger and Huff (1993) for their part, studying the relation between cognitive strategic groups and performance, have found consistency in performance within groups and heterogeneity in performance between groups in the case of U.S. regional banks. Performance was measured by the fact that a bank has remained or not independent five years after the collection of perceptual data for the identification of strategic groups. Reger and Huff (1993: 114) point out, however, that the small size of their sample did not allow them to truly demonstrate the existence of a causal link between strategic group membership and performance.

1.3 Strategic Groups and Performance: a Double Lighting

Many authors, recognizing the potential complementarity of the "objective" and cognitive approaches to strategic groups, have therefore recommended to use them simultaneously to link strategic groups with other strategic variables. Bogner and colleagues (1994: 301) estimate that the two approaches to strategic groups lead to the same question for strategy makers: what are the implications of these groups on their members? It would be therefore

preferable to avoid this theoretical «dead end" to develop a third model incorporating both paradigms a priori "incompatible" to produce a more comprehensive and relevant model (Bogner & Thomas, 1993). Scott (1981: 173) in a similar perspective suggests that "perception measures are necessary if one wants to predict the choices or behaviors of members of the organization, but they are not sufficient if one wants to predict the result of those choices». This author believes that these two visions of the environment make valid contributions, but on different points, so a complete model should include these two views.

As pointed out by Porac and colleagues (1989), using the theory of "enactment" (Weick, 1979), industry structure determines managerial perceptions and at the same time emerges from them. So there are interactions and feedbacks between economic and cognitive factors. Hanson and Wernerfelt (1989) simultaneously measured the impact of economic and behavioral factors on performance. In their research, a model based on the industrial economy, including the size of the firm and its market share and a model derived from the behavioral theory were integrated, and a significant contribution of each of these two sources on firm performance as a whole was observed.

As numerous studies that focused on “objective” strategic groups have not provided satisfactory results regarding their link to performance, while studies positioned on the cognitive approach have insufficiently explored this question, it therefore seems legitimate to investigate the link between strategic groups and performance considering simultaneously the arguments from both approaches. We nevertheless consider the case where top managers’ representations of strategic groups are similar. In such a case, these cognitive strategic groups are close to the “objective” ones.

2. Strategic Groups Performance

As we noted earlier, many studies, mostly based on "objective" approach to competition, have focused on the link between strategic groups and performance including seeking the concepts of barriers to mobility and competition. However, the results were often contradictory: performance varies or does not vary both within strategic groups and between strategic groups.

2.1 Explaining Factors of Performance Differences between Strategic Groups

As the economic or “objective” approach to strategic groups further studied their relation to performance than the cognitive one, we mainly present the arguments and empirical studies of the authors positioned on the first approach. According to them, two interrelated key concepts explain the homogeneity of performance within a strategic group and the heterogeneity of performance among different strategic groups: barriers to mobility and competition.

2.1.1 The Mobility Barriers Concept

The concept of barriers to mobility is an extension of the concept of "barriers to entry" of an industry formulated by Bain (1956). Caves and Porter (1977), and later Porter (1980), have indeed applied this concept to strategic groups, suggesting that just as it exists in an industry barriers to entry, barriers to mobility between groups within an industry also exist. Leask (2004) defines strategic groups as stable structures in an industry separated by barriers to mobility and pursuing different strategies impacting performance. These barriers protect each strategic group from the competition of players located outside the group and thus lead to differences in performance (Short et al. 2007; Tywoniak et al., 2007). This concept implies that a company in a given sector makes decisions that cannot be imitated by other firms outside its strategic group unless they agree on an "increase of their costs, a loss of time and an uncertainty about the outcome of these decisions "(McGee, 1985). The height of barriers to mobility therefore depends on the cost of entering into a strategic group, that is to say non-recoverable investments that any newcomer must make to adopt the strategy applied in the group (Bidault, 1988). Such barriers may result from the actions of individual firms or the collusion between strategic group members (Dranove & Peteraf, 1998).

Investments in both tangible (e.g. plant and equipment) and intangible (e.g.name and reputation) assets and uncertainty about the ability of firms to copy successful competitors (Lippman & Rumelt, 1982) contribute to the construction of these barriers to mobility. The distribution system has been identified as constituting a major barrier in pharmacy and insurance industries (Cool & Schendel, 1987). The establishment of standard operating procedures, bureaucracy and organizational culture are also likely to inhibit the ability of a firm to enter a strategic group.

2.1.2 Intra and Inter Strategic Group Rivalry

Behind the concept of mobility barriers implicitly lies the idea that the level of rivalry within and between different strategic groups differs (Cool & Dierickx, 1993; Peteraf, 1993; Porter, 1979).The concept of mobility barriers associated with the one of collusion implies that the rivalry within strategic groups would be low. The theory of oligopoly (e.g. Stigler, 1964) suggests that there exists in industries coordination mechanisms based on group consensus reducing the rivalry within the group. The intra-group rivalry is low when firms recognize their mutual dependence and cooperate or tacitly collude (Caves & Porter, 1977; Peteraf, 1993; Porter, 1979). In addition, many

authors have defined strategic groups based on strategic alliances or inter-firm networks (e.g. Ketchen et al. 1993; Thomas & Carroll, 1994). Duysters and Hagedoorn (1995), in particular, believe that firms with similar resources are likely to have the same suppliers and customers, which facilitates communication and coordination within the strategic group. Lawless and Anderson (1996) concluded that competition was less intense among the most productive firms in a similar ecological niche. Lying on a cognitive approach, Peteraf and Shanley (1997) suggested that, when firms see themselves as belonging to the same strategic group, they benefit from the positive effects of coordination, efficiency and reputation. Yami and Benavent (2000), for their part, believe that strategic groups could be defined not by a principle of resemblance but by a principle of complementarity.

Jayachandran and colleagues (1999: 50), however, believe that collusion between firms may be challenged by a major innovation: "companies may be inclined to see the mutual dependence as a preferable alternative to a frenzied rivalry, but they would not reject the possibility to dominate the market with a major innovation." As pointed out by McNamara and colleagues (2003: 167), research using "hard" data or perceptual one showed that rivalry was stronger within strategic groups than between strategic groups. For some authors, competition is actually greater among firms that are similar to each other on key strategic and structural dimensions (Dess & Davis, 1984; McGee & Thomas, 1986; Thomas and Pollock, 1999).

According to Porter (1979), the degree of rivalry within a group depends on its structure. Thus, large groups whose members differ significantly in terms of size and preference for risk have probably a greater internal rivalry than smaller groups. Members of a group may target the same consumers and quickly copy the competitive move of a rival (McGee et al. 1995: 258). According to the resource-based view, a firm that has chosen to differentiate its resources will be less exposed to the effects of competition (Barney, 1991, Hatten & Hatten, 1987, Nelson, 1991; Rumelt, 1984; Wernerfelt, 1984). Gimeno and Woo (1996) found that the similarity in the strategies of airlines was related to greater competition. Cool and Dierickx (1993) have also found a significant intra-group rivalry in the pharmaceutical industry by using historical data over a period of 20 years.

From a cognitive perspective, Fiegenbaum and Thomas (1995) suggest that firms are likely to focus on their competitive position within their group and be more attentive and responsive to the actions of members of their own group than to those of members of other groups. Other authors have shown that managers perceive a greater rivalry within their belonging strategic group (e.g. Hodgkinson & Johnson, 1994; Porac et al., 1995).

The results of Denglos (2002) on the computer industry confirm the explanatory power of strategic groups vis-à-vis competitive behavior. The author stresses that "the number of actions and reactions, the number of actions initiated, the frequency of price decreases and the rapidity of response to competition depends on the strategic group in question" (2002: 155). In all cases, the results do not confirm an attenuation of rivalry within groups, even if the nature of this rivalry differs according to groups.

Dranove and colleagues (1998) noted that competition between firms in different groups may be less vigorous than competition between firms within the same group. Hagedoorn (1993), for his part, believes that market and technology complementarity is a major cause of inter-firm partnerships. Complementarity thus suggests that firms in the same strategic group are not necessarily the most appropriate partners for partnerships, this suggesting a lower rivalry between strategic groups.

However, according to Porter (1980), a strong rivalry between groups occurs when the differences between groups involve heterogeneous resources and varied patterns of competitive behavior, as it makes it difficult to predict and coordinate actions with firms located in other groups. An increase in strategic distance should therefore, all things being equal, lead to more competition between groups than within strategic groups (Porter, 1979). In addition, as membership in certain groups may appear as more desirable because of their high level of performance or their lack of internal competitive rivalry, we can therefore expect greater competition between these groups and smaller groups performance (McGee et al. 1995: 258). Empirically, Peteraf (1993), in the airline industry, has shown that the rivalry between strategic groups was higher than the rivalry within strategic groups. In the case of the pharmaceutical industry over 20 years, Cool and Dierickx (1993) showed that intra-or inter group rivalry was alternately dominant.

Denglos (2002) therefore concludes that the supposed superiority of the rivalry between groups with respect to the intra-group rivalry is subject to contradictory results. No theoretical perspective can properly adjudicate this issue very clouded by empirical results (Denglos, 2002: 137). He argues that this lack of convergent results could be primarily attributed to the paradox of the strategic groups theory: competition between groups is assumed higher than the intra-group rivalry, while the groups are formed from mobility barriers reducing competition between groups. He therefore suggested to mitigate the bilateral effect hypothesis of mobility barriers so that a group can be a

strong rival for another without the opposite being true. This author also explains the different nature of the findings on inter-and intra-group rivalry by the diversity of the competition measures that have been used.

As theories and results are contradictory regarding the effect of barriers to mobility on rivalry within and between strategic groups, it is therefore somewhat not surprising, as we shall see that the results on the relation between strategic groups and performance have been conflicting.

2.2 Inter and Intra Strategic Group Performance

Whereas most research focused on performance differences between strategic groups, few studies have examined the performance differences between firms within the same group. Some studies, simultaneously considering these two questions, sought to determine whether differences in performance in an industry were more important between strategic groups or within strategic groups.

2.2.1 Performance Differences between Strategic Groups

The degree of rivalry is an intermediate variable of the effect of strategic groups on performance (Cool & Dierickx, 1993; Mehra & Floyd, 1998: 521). Barriers to mobility, as they create monopoly rents and promote cooperative practices within the group, allow member firms to achieve a sustainable superior performance (Caves & Porter, 1977; Mascarenhas & Aaker, 1989; Porter, 1980). It is therefore expected that the highest barriers protect the most profitable groups, their members having a higher capacity to prevent imitation by firms outside the group (McGee et al. 1995: 258). In addition, firms in different groups operate in heterogeneous competitive environments with varying munificence and profit potential (McNamara et al. 2003: 165). McGee and Thomas (1986) thus suggest that variations in industry performance can be explained by the homogeneity of firms' performance within groups and the heterogeneity of firm's performance between groups. Denglos (2002: 136) states that achieving higher profits within a group will be dependent upon the fact that this group includes a small number of firms, or six at most, and the existence of barriers to mobility. Mehra and Floyd (1998), meanwhile, believe that significant performance differences between strategic groups only occur in industries characterized by high product-market heterogeneity and inimitable resource configurations, including intangible ones (Wernerfelft, 1989), this situation forming barriers to mobility.

Numerous empirical studies found significant performance differences between strategic groups (e.g. Cool & Schendel, 1987, Dess & Davis, 1984; Dikmen et al., 2009; Hatten, 1974; Kale & Arditi, 2003; Mascarenhas & Aaker, 1989; Nair and Kotha, 2001; Oster, 1982; Schreyögg & Von Reitzenstein). Denglos (2002) found significant performance differences between strategic groups in the computer industry, as companies diversifying or specializing had a statistically different performance. He stressed that the structure of strategic groups has no significant influence on the results of firms: group size is equivalent when profits are significantly different. He therefore concludes that obtaining superior results to the ones obtained in a pure competitive situation is dependent on the existence of barriers to mobility but is independent of the number of firms (Denglos, 2002: 151).

Other authors, however, tended to demonstrate, both theoretically and empirically, that performance differences between strategic groups could not occur. Mehra and Floyd (1998: 513) argue in particular that it is perfectly conceivable that different competitive strategies, implemented in munificent environments, can achieve comparable results. Barney and Hoskisson (1990: 194-195) point out that when the number of firms in each strategic group is high enough to cause a pure and perfect competition, the observation of differences in performance between groups is compromised.

Empirically, many authors have thus failed to establish statistically significant financial performance differences between strategic groups (e.g. Claver et al. 2003; Claver et al. 2006; Lewis & Thomas, 1990; Porter 1979). Ketchen and colleagues (1997) conducted a meta-analysis of 33 studies comprising 40 independent samples. These studies were comparing performance differences between strategic groups. They concluded that there were significant differences in performance between groups, but group membership explained only 8% of these differences. Overall, there is indeed an effect of the strategic group on performance, but it may be small (McNamara et al. 2003: 167).

2.2.2 Variations in Performance within Strategic Groups

As pointed out by McNamara and colleagues (2003: 168), although the possibility of performance differences among groups was demonstrated by Cool and Schendel (1988) and Lawless and colleagues (1989), the theoretical foundations of these performance differences were not examined in depth. Many authors positioning themselves on the perspective of the industrial economy have indeed suggested that performance within strategic groups is homogeneous (McGee & Thomas, 1986).

However, the resource-based view (Hatten & Hatten, 1987; Rumelt, 1984) and the contestable markets theory (Baumol et al. 1982; Cool & Dierickx, 1993, Hatten & Hatten, 1987) suggest that some firms in a group can develop

strategic positions based on a unique product-market configuration or unique resources. Some resources may indeed be specific to the firm, while others are shared by all members of the strategic group (Mehra & Floyd, 1998: 517). Rumelt (1984), for his part, suggested that there exist isolation mechanisms limiting the equalization of profits within strategic groups.

Some empirical studies following the resource-based view have noted differences in performance between firms within the same group (e.g. Cool & Schendel, 1987, 1988, Lawless et al., 1989). Nair and Kotha (2001), for example, found that the variables located at both the firm and group levels have significant effects on performance. Claver and colleagues (2006) found differences in performance between hotels in Alicante following the same strategy. McNamara and colleagues (2003), for their part, have found little evidence of consistency of performance within cognitive strategic groups.

2.2.3 The Superiority of Performance Gaps within and between Groups

Some authors have studied simultaneously the performance gaps within and between strategic groups. According to Denglos (2002: 138), the existence of performance differences within strategic groups in particular can explain why some authors have noted the absence of significant performance differences between strategic groups, the differences in resources within groups may be indeed more important than those between groups. Denglos(2002: 153), on the basis of his results, points out that "without questioning the existence of mechanisms limiting ex post the equality of profits within groups, which enlightens the role of asymmetric resources, performance variance between groups is greater than the one within groups". Mehra and Floyd (1998: 525), meanwhile, speculate that in industries characterized by low heterogeneity of products and markets and imitable resource configurations, differences in economic performance of firms will be higher within the groups that between them.

In all cases, as pointed Denglos (2002: 138), "the relationship between group membership and performance is still an open question. No consensus emerged, both at the theoretical or empirical levels." However, it seems that literature, focusing primarily on performance differences between strategic groups since assuming homogeneity of performance within groups, is looking more and more to any performance differences within groups.

Literature, thus tending to take more into account any performance differences within strategic groups, is analyzing therefore the positioning of firms in relation to strategic groups. In other words, firms within the same strategic group may have differences in resources and performance.

3. Strategic Groups and Positioning of the Firm

Before deciding what type of positioning of the firm in respect to strategic group is associated with optimal performance, it is necessary to consider the different types of articulation that may exist between the positioning of the firm and strategic groups.

3.1 On the Existence of an Inter and Intra Strategic Groups Heterogeneity

Many researchers from different theoretical perspectives have suggested that strategic groups were not homogeneous in terms of both the number of companies composing them and the degree of similarity of their members.

Thus, for example, Fiegenbaum and Thomas (1993) have identified six strategic groups in the insurance industry over the period 1983-84. The largest group consisted of 19 members while the other two groups included only 6 and 3 members. They also identified three solitary firms occupying unique strategic positions. Similarly, Mascarenhas (1989) identified a multiple groups structure in the refining industry: a group contained 80% of firms in the industry whereas a firm had a unique strategic position. Cool and Schendel (1987) and Reger and Huff (1993) also identified strategic groups consisting of a single firm.

Regarding the internal structure of strategic groups, some authors from both the economic and cognitive perspectives suggested that there were core and peripheral firms in a strategic group (Caves & Porter, 1977; Claver-Cortes, 2006; Desarbo & Grewal, 2007; Dharwadkar & Grewal, 2002; Ketchen et al. 1993; Peteraf & Shanley, 1997). Porac and Thomas (1990), for example, believe that industries are fuzzy sets of firms that differ in their degree of correspondence to the "ideal" of their belonging categories. Managers in the study by Reger and Huff (1993) on U.S. banks have identified a significant number of firms following the basic strategy of their strategic group, while a smaller number were following this strategy to a lesser degree, although being considered members of the group. According to Reger and Huff (1993: 114), a cognitive strategic group will tend to be composed of core members and a less distinct periphery. Firms located on the periphery of the strategic group (called secondary firms), although similar on many key strategic dimensions to the ones located in the heart of strategic group (called central firms), are also taking unique strategic decisions. Strategic group membership is therefore a matter of degree (Reger & Huff, 1993: 114). These authors also state that strategic groups may cross each other, some companies belonging to two groups or more simultaneously.

3.2 Explaining Factors of the Heterogeneity of Strategic Groups Structure

As pointed out by McNamara and colleagues (2003: 165), researchers on strategic groups have used at least three theoretical perspectives to explain internal differences in a group: the cognitive perspective (e.g. Reger & Huff, 1993), the resource-based view (e.g. Wernerfelt, 1984) and the isolation mechanisms perspective (e.g. Rumelt, 1984). As the resource-based and isolation mechanisms views have already been mentioned when presenting the studies on the relation between strategic groups and performance, we focus specifically on the cognitive perspective and the arguments developed by Reger and Huff (1993):

- The properties of cognitive categorization: a firm sharing many common points with its group will probably be frequently seen as a good example of this category (Porac & Thomas, 1990) and thus be considered a core firm of its strategic group.

- The degree of cognitive identification with the strategic group: Peteraf and Shanley (1997), using the concept of organizational identity (Albert & Whetten, 1985) argued that members of a strategic group might differ in their degree of identification with their strategic group.

- The industry realignment: in the case of an industry being in a transitional phase calling into question the key strategic dimensions, some observers may emphasize the positions of firms prior to this transition, while others may anticipate their future positions (Reger & Huff, 1993).

- Obscure strategies: as firms may have an interest in concealing their intentions to gain a competitive advantage derived from the effect of strategic surprise (Porter, 1980), the strategies of some companies, intentionally or not, are difficult to interpret and may be characterized in different ways by observers (Reger & Huff, 1993).

- Firms changing strategy: even during the most stable periods of an industry evolution, the strategies of some firms may be in a situation of flux, the observers then focusing on the longstanding, current or anticipated position of the firm.

- Firms with inconsistent strategies: some firms may not follow clear-cut and stable strategies over time, such firms being described as "stuck in the middle" (Porter, 1980) or "reactive" (Miles & Snow, 1978).

- Firms with new strategies: such firms have a consistent strategy but do not fit into the cognitive map that generally describes all the other competitors in the industry.

3.3 The Different Types of Positioning of Firms Regarding Their Strategic Group

Following mostly the arguments of Reger and Huff (1993: 117), it is therefore possible to distinguish different cases depending on the position of firms in relation to strategic groups:

- “Solitary” firms: they are the only members of a strategic group, this group being defined according to the dimensions normally used to define strategic groups within the industry.

- Firms central to their strategic group: they are closely related to their strategic group and define its core strategy.

- Firms in the periphery of their strategic group: also called secondary firms, they have a strategy that is not exactly similar to the one of central firms.

- "Defector firms: they are undergoing a transition from a strategic position to another one along dimensions that are common to other firms in the industry.

- “Inconsistent” firms: they have no clear strategy over a long period of time and frequently change their strategy according to circumstances.

- “Idiosyncratic” firms: they have a strategy that can be described as new because they cannot be characterized based on the dimensions used to explain the strategies of most other firms in the industry.

- Firms belonging to several strategic groups: they share certain characteristics with a strategic group and others with another group.

Having shown that strategic groups are characterized by internal heterogeneity in terms of performance, the number of firms composing them and the positioning of their member firms, it is therefore necessary to examine the performance of the firm based on its position in its strategic group.

4. Firm Positioning Regarding Strategic Groups and Performance

Authors are mainly interested in three of the cases previously presented to characterize firm performance based on its position in relation to strategic groups: core firms, secondary firms and “solitary” firms. The issue of performance has therefore been addressed in terms of similarity or difference in relation to other firms in the industry, some authors, using conflicting theoretical perspectives, stressing that performance comes from being

similar (case of core firms that very similar to other firms in their strategic group) or from being different (case of "solitary" firms that are different from other firms in the industry as being the only ones to pursue a certain strategy). A perspective integrating difference and similarity, called theory of strategic balance and mostly developed by Deephouse (1999), stresses that secondary firms (or moderately similar or moderately different) would be the most successful ones in an industry.

4.1 Performance Related to the Fact of Being Different

Many theoretical perspectives highlight the benefits associated with having a unique strategic positioning. Thus, the theory of contestable markets (Baumol et al., 1982) applied to strategic groups (e.g. Cool & Dierickx, 1993, Hatten & Hatten, 1987) highlights the value of being strategically different, highly similar firms facing more rivalry.

According to the resource-based view, a firm that takes advantage from differentiating its resources will be less exposed to the effects of competition (Barney, 1991, Hannan et al. 1990; Hatten & Hatten, 1987; Henderson, 1981; Porter, 1991; Rumelt, 1984; Wernerfelt, 1984) and can then expect a higher profit level. The market is indeed supposed to have a finite level of resources at a certain point of time, these resources being then divided among the firms competing for the same strategic positions (Baum & Mezi, 1992; Baum & Singh, 1994). Solitary firms would seek resource configurations associated with unique and inimitable niche-market products to achieve a sustainable competitive advantage and benefit from local monopolies (Barney, 1991; Peteraf, 1993; Wernerfelt, 1984).

Peteraf and Schanley (1997) note that firms located at the heart of their strategic group tend to be more resistant to change and to have a myopic vision of the industry because of their strong identification with the group. These core companies, as being more visible, should be more frequently identified as competitors by members of their strategic group and then face more rivalry (Porac and colleagues, 1995). These theoretical perspectives suggest that "solitary" firms, that is to say not belonging to a strategic group made up of several members, should be more successful than central or secondary firms to their strategic groups, secondary firms being at the same time more successful than central firms (McNamara et al. 2003: 169).

4.2 Performance Related to the Fact of Being the Same

Several arguments and theoretical perspectives, particularly institutional-theory through the concept of legitimacy, suggest that the most similar firms are the most efficient.

According to Reger and Huff (1993), the deviation from the heart of the strategic group may reflect the inability of a firm to implement the strategy of the strategic group. Peteraf and Shanley (1997), for their part, have proposed that firms who identify strongly with their strategic group will be more effective to exchange information, transfer resources and work collectively for their mutual benefit. Oligopoly theory applied to strategic groups suggests that firms that identify strongly with the group recognize their interdependence and act together more effectively to create competitive barriers (Caves & Porter, 1977; Reger & Huff, 1993). McNamara and colleagues (2003: 169), meanwhile, noted that solitary firms are vulnerable to competitive actions taken against them by strategic groups composed of several members.

The main benefit for the firm from being similar to others that have been stressed by institutional theory or organizational isomorphism is related to legitimacy (Chen & Hambrick, 1995, DiMaggio & Powell, 1983; Hybels, 1995; Meyer & Rowan, 1977). This greater legitimacy allows firms to acquire resources on preferential terms from suppliers and customers for at least three reasons (Pfeffer & Salancik, 1978; Suchman, 1995). First, potential exchange partners are more willing to interact with firms whose strategies are easily understood or seen as rational (McNamara et al., 2003). Second, exchange partners are likely to offer more favorable terms and higher quality products to legitimate firms, the legitimacy of a business partner being reinforced by the fact of contracting with a legitimate firm (Deephouse, 1999; Peffer & Salancik, 1978; Wood, 1991). Third, exchange partners may require additional risk premiums from less legitimate firms because of their greater likelihood of failure (Baum & Oliver, 1991, DiMaggio & Powell, 1983; Singh et al., 1986). An organization that does not pay attention to its legitimacy could therefore disappear faster than its competitors that have gained outside support necessary for their survival (Singh et al., 1986). Empirical research has thus indirectly supported the proposition that conformity strategy leads to higher performance thanks to a strong legitimacy (Abrahamson & Hegeman, 1994, Chen & Hambrick, 1995; Deephouse, 1999, Miller & Chen, 1995).

Some authors have applied institutional theory and especially the concept of legitimacy to strategic groups. Peteraf and Shanley (1997) estimate that strategic group membership promotes the legitimacy of individual firms. Firms described by Reger and Huff (1993) as "unclassifiable" and "idiosyncratic" do not benefit from gains in legitimacy due to belonging to a group: even if they begin a move towards a particular strategic group, they will not capture the

benefits of legitimacy as they will not become sufficiently similar to group members to be recognized as part of this group (Deephouse, 1999).

Taken together, these perspectives involving strategic similarity and performance imply that firms central to strategic groups should be more successful than secondary and solitary firms and secondary firms should be more successful than solitary firms (McNamara et al., 2003: 168).

4.3 The Theory of Strategic Balance

Deephouse (1999), developing the theory of strategic balance and then applying it to the case of cognitive strategic groups (McNamara et al., 2003), integrates into a single theory the conflicting perspectives outlined above, namely that the firm performance is associated with similarity or difference. In established markets whose competitive and institutional forces are high, the proposals for differentiation and similarity would both be significant according to this author. The two streams are then synthesized by Deephouse in a proposal on strategic balance, which states that moderately differentiated firms perform better than firms that are similar to other ones or that are very different. Performance would then result from the balance between similarity and difference, companies for their strategic decisions arbitrating in a perspective of intermediate differentiation between the benefits of increased legitimacy from being more similar to their rivals and the benefits of reduced competition from being different. Because members of the organizational field do not perceive or are indifferent to some degree of differentiation, firms may be different from their competitors to some degree while maintaining their legitimacy.

Deephouse (1999) has therefore emphasized in the research perspectives he identified that the validity of the theory of strategic balance can measured regarding strategic groups. A firm belonging to a strategic group should according to him try to distinguish itself from other firms in this group to reduce the intensity of competition it faces. However a firm, to maintain its legitimacy, should not adopt a strategy that deviates from the range of strategies acceptable to its group. McNamara and colleagues (2003), following the research perspectives identified by Deephouse (1999), have therefore studied the performance of core, secondary and solitary firms in the case of U.S. banks located in the same urban area. These authors found results consistent with the theory of strategic balance. Indeed, secondary banks had superior financial performance compared with solitary or central banks, the central banks belonging to the same group as the secondary firm or belonging to a separate group. These authors also showed that the strategic intentions of the firms have maintained or increased over time the strategic differences between core and secondary firms. Thus, it appears that secondary firms expect to maintain their unique position whereas core firms have no intention of imitating them. This may then result in stable differences in performance levels between them.

Many authors have suggested that the strategic group has an effect on performance, mostly through the effect of mobility barriers and competition. However, if this issue was mainly addressed by the authors positioned on the "objective" approach to strategic groups, without leading to conflicting results, the results obtained by researchers clearly positioned on the cognitive approach (Reger & Huff, 1993), or seeking to integrate the two approaches (McNamara et al., 2003) seem to lead to concluding results. The results of the first studies on the relationship between the positioning of firms, strategic groups and performance, in particular, seem promising. Consistent with the theory of strategic balance, they tend to show that the most successful firms are those located on the outskirts of strategic groups as they simultaneously receive the benefits of legitimacy and differentiation. Nevertheless, the performance of some firms identified by Reger and Huff (1993), for example, as firms belonging simultaneously to several strategic groups, has not yet been studied empirically. As highlighted by Deephouse (1999), these firms could benefit from the legitimacy of several groups while facing less competition from their members.

5. Conclusions and Future Research Directions

To conclude, the performance of firms based on their position in relation to strategic groups should be tested in different contexts. In the case of the banking sector, for example, the institutional environment is strong (Scott, 1995) which may explain the need for a minimum of legitimacy to be successful (McNamara et al. 2003: 178). However, the methodology for identifying strategic groups, whether based on the economic paradigm, the cognitive paradigm or a synthesis of both, is likely to have a very strong influence on the research results. It may therefore seem questionable to compare the results of studies that used different methodologies to identify strategic groups. It would therefore be desirable in future work to use, in one study, several different methods for constructing groups, which is rarely done.

In addition, performance is generally treated in the studies on strategic groups in the narrow terms of profitability, thus opposing a broader view including financial and operational measures (McGee et al. 1995; Peteraf & Shanley, 1997). It therefore seems important that multiple measures of performance are incorporated in the analysis of strategic groups.

In all cases, we believe that research on the relation between strategic groups and performance, although it led to contradictory results, should not be abandoned but rather focus on models that incorporate cognitive and economic perspectives. Empirical studies taking into account the model of Bogner and Thomas (1993), in particular, have not yet been conducted. It would also be necessary to identify more precisely in what conditions an industry tends to favor a certain type of relation between strategic groups and performance.

Other studies examining the performance of firms based on their position regarding strategic groups, for instance by considering the different cases identified by Reger and Huff (1993), should also be conducted in different contexts of industries. We propose, in continuation of the study of McNamara and colleagues (2003), to conduct an empirical study measuring the performance of firms with distinct positions in relation to strategic groups. Such a study would allow us at first to generalize the results found by MacNamara and colleagues (2003), namely that the most successful firms are the ones located at the periphery of their strategic group. Second, this study could allow us to characterize the performance of firms that are not taken into account by these authors, namely "defector", inconsistent and idiosyncratic firms, and the ones belonging to several strategic groups. This will require therefore to incorporate a dynamic perspective to the theory of strategic balance of Deephouse, performance being also considered regarding the evolution of the position of firms regarding their strategic groups. Theoretical developments should also enable us to make assumptions about the type of positioning of the firm in respect to strategic group and performance. We also believe that taking into account specific strategic groups (number of firms within the group, size, degree of rivalry, etc.) should allow us to improve the theory of Deephouse, allowing us to distinguish differences in performance between firms that share a similar positioning in the strategic group. Such a study would also require to complete and to improve the tools used by McNamara and colleagues (2003) to measure the distance from the heart of a strategic group. It is quite possible indeed that the results obtained by McNamara and colleagues (2003) depend heavily on the way the distance between firms was measured in this study.

References

Abrahamson, E., & Hegeman, R. (1994). Strategic conformity: an institutional theory explanation, Paper presented at the annual meeting of the Academy of Management, Dallas.

Albert, S., & Whetten, D. A. (1985). Organizational Identity. *Research in Organizational Behavior*, 7, 263-296.

Bain, J. S. (1956). *Barriers to new competition*, Harvard University Press.

Barney, J. B., & Hoskisson, R. E. (1990). Strategic Groups: Untested assertions & research proposals. *Managerial & Decision Economics*, 11(3), 187-198. http://dx.doi.org/10.1002/mde.4090110306

Baum, J. A. C., & Oliver, C. (1991). Institutional linkages & organizational mortality. *Administrative Science Quarterly*, 36(2), 187-218. http://www.jstor.org/stable/2393353

Baum, J. A. C., & Singh J. V. (1994). Organizational niches & the dynamics of organizational founding. *Organization Science*, 5(4), 483-501. http://www.jstor.org/stable/2635178

Baumol, W. J., Panzar, J. C., & Willig, R. D. (1982). *Contestable markets & the theory of industry structure*, Harcourt Brace Jovanovich.

Bidault, F. (1988). *Le champ stratégique de l'entreprise*, Economica.

Bogner, W. C., Pandian, J. R., & Thomas, H. (1994). Firm specific forces underlying strategic groups dynamic, *in* Daems, H., & Thomas, H. (Eds.), *Strategic Groups, Strategic Moves & Performance*, Oxford: Pergamon Press, 299-329.

Bogner, W. C., & Thomas, H. (1993). The role of competitive groups in strategy formulation: a dynamic integration of two competing models. *Journal of Management Studies*, 30(1), 51-67. http://dx.doi.org/10.1111/j.1467-6486.1993.tb00295.x

Caves, R., & Porter, M. E.. (1977). From entry barriers to mobility barriers. *Quarterly Journal of Economics*, 91(2), 241-261. http://dx.doi.org/10.2307/1885416

Chen, M. J., & Hambrick, D. C.. (1995). Speed, Stealth & Selective Attack: How small firms differ from large firms in competitive behavior. *Academy of Management Journal*, 38(2), 453-482. http://dx.doi.org/10.2307/256688

Claver-Cortés, E., Molina-Azorin, J. F., & Pereira-Moliner, J. (2006). Strategic groups in the hospitality industry: intergroup & intragroup performance differences in Alicante Spain. *Tourism Management*, 27, 1101-1116, http://dx.doi.org/10.1016/j.tourman.2005.11.006

Claver, E., Molina, J. F., &Tari, J. J. (2003). Strategic groups & firm performance: The case of Spanish house-building firms. *Construction Management & Economics*, 21(4), 369–377. http://dx.doi.org/10.1080/0144619032000111250

Cool, K., & Dierickx, I. (1993). Rivalry, Strategic groups & Profitability. *Strategic Management Journal*, 14(1), 47-59. http://dx.doi.org/10.1002/smj.4250140106

Cool, K., & Schendel, D. (1987). Strategic group formation & performance: the case of the U.S. pharmaceutical industry, 1963-1982, *Management Science*, 33(9), 1102-1124.

Deephouse, D. L. (1999). To be different, or to be the same? It's a question (& theory) of strategic balance. *Strategic Management Journal*, 20(2), 147-166. http://dx.doi.org/10.1002/(SICI)1097-0266(199902)20:2<147::AID-SMJ11>3.0.CO;2-Q

Denglos, G. (2000). Concurrence, asymétrie des ressources et compétitivité des organisations: une étude empirique appliquée aux sociétés de services et d'ingénierie informatiques. *Actes de la IXème Conférence de l'AIMS,* Montpellier.

Denglos, G. (2002). Groupes stratégiques, comportements concurrentiels et performance, dans F. Le Roy (Ed.). *La Concurrence: entre affrontement et connivence*, Vuibert, 135-156.

Desarbo, W. S., & Grewal, R. (2008). Hybrid strategic groups. *Strategic Management Journal*, 29(3), 293-317. http://dx.doi.org/10.1002/smj.658

Dess, G. G., & Davis, P. S. (1984). Porter's (1980) generic strategies as determinants of strategic group membership & organizational performance. *Academy of Management Journal*, 27(3), 467-488. http://dx.doi.org/10.2307/256040

Dikmen, I., Birgonul, T., & Budayan, C. (2009). Strategic group analysis in the construction industry. *Journal of Construction Engineering & Management*, 135, 288-297. http://dx.doi.org/10.1061/(ASCE)0733-9364(2009)135:4(288)

DiMaggio, P. J., & Powell, W. W. (1983).The iron cage revisited: institutional isomorphism & collective rationality in organizational fields. *American Sociological Review*, 48, 147-160. http://dx.doi.org/10.2307/2095101

Dooley, R. S., Fowler, D. M. & Miller. A. (1996). The benefits of strategic homogeneity & strategic heterogeneity: theoretical & empirical evidence resolving past differences. *Strategic Management Journal*, 17(4), 293-305. http://dx.doi.org/10.1002/(SICI)1097-0266(199604)17:4<293::AID-SMJ808>3.0.CO;2-N

Dranove, D., & Peteraf, M. (1998). Do strategic groups exist? An economic framework for analysis. *Strategic Management Journal*, 19(11), 1029-1044. http://dx.doi.org/10.1002/(SICI)1097-0266(1998110)19:11<1029::AID-SMJ992>3.0.CO;2-L

Duysters, G., & Hagedoorn, J. (1995). Strategic groups & inter-firms networks in international high-tech industries. *Journal of Management Studies*, 32(3), 359-381. http://dx.doi.org/10.1111/j.1467-6486.1995.tb00780.x

Fiegenbaum, A., & Thomas, H. (1993). Industry & strategic groups dynamics: competitive strategy in the insurance industry, 1970-84. *Journal of Management Studies*, 30(1), 69-105. http://dx.doi.org/10.1111/j.1467-6486.1993.tb00296.x

Fiegenbaum, A., & Thomas, H. (1995). Strategic groups as reference groups: theory, modeling & empirical examination of industry & competitive strategy. *Strategic Management Journal*, 16(6), 461-476. http://dx.doi.org/10.1002/smj.4250160605

Gimeno, J., & Woo, C. Y. (1996). Hypercompetition in a multimarket environment: the role of strategic similarity & multimarket contact in competitive desescalation. *Organization Science*, 7(3), 322-341. http://www.jstor.org/stable/2635093

Grewal, R., & Dharwadkar, R. (2002). The role of the institutional environment in marketing channels. *Journal of Marketing*, 66, 82–97. http://dx.doi.org/10.1509/jmkg.66.3.82.18504

Hagedoorn, J. (1993). Understanding the rationale of strategic technology partnering: interorganizational modes of cooperation & sectoral differences. *Strategic Management Journal*, 14(5), 371-385. http://dx.doi.org/10.1002/smj.4250140505

Hannan, M. T., Ranger-Moore, J., & Banaszak-Holl, J. (1990). Competition & the evolution of organizational size distributions, *in* J. V. Singh (Ed.), *Organizational Evolution: New Directions*, Sage, Newbury Park, CA, 246-268.

Hansen, G., & Wernerfelt, B. (1989). Determinants of firm performance: the relative importance of economic & organizational factors. *Strategic Management Journal*, 10(5), 399-411. http://dx.doi.org/10.1002/smj.4250100502

Hatten, K. J., & Hatten, M. L. (1987). Strategic groups, Asymmetrical Barriers & Contestability, *Strategic Management Journal*, 8(4), 329-342. http://dx.doi.org/10.1002/smj.4250080404

Hatten, K. J. (1974). Strategic models in the brewing industries, Unpublished doctoral dissertation, Purdue University.

Henderson, B. D. (1981). *The Concept of Strategy*, Boston Consulting Group, Boston, MA.

Hodgkinson, G. P., & Johnson, G. (1994). Exploring the Mental Models of Competitive Strategists: The case for a processual approach. *Journal of Management Studies*, 31(4), 525-551. http://dx.doi.org/10.1111/j.1467-6486.1994.tb00629.x

Hodgkinson, G. P. (1997a). The Cognitive Analysis of Competitive Structure: A Review & Critique. *Human Relations*, 50(6), 625-654.

Hybels, R. C. (1995). On legitimacy, legitimation, & organizations: a critical review & integrative theoretical model, *in* D. P. Moore (Ed.). *Academy of Management Best Papers Proceedings*, 241-245.

Jayachandran, S., Gimeno, J., & Varadarajan, P. R. (1999).The theory of multimarket competition: a synthesis & implications for marketing strategy. *Journal of Marketing*, 63(3), 49-66.

Lamoureux, S. (1997). Organizational configurations & performance: a meta-analysis. *Academy of Management Journal*, 40(1), 223-240.

Kale, S. & Arditi, D. (2003). Differentiation, conformity, & construction firm performance. *Journal of Management & Engineering*, 19:2, 52–59.

Ketchen, D. J., Snow, C. C. & Hoover, V. L. (2004). Research on Competitive Dynamics: Recent Accomplishments & Future Challenges. *Journal of Management*, *30*, 779–804.

Ketchen, D. J., Thomas, J. B., & Snow, C.C. (1993). Organizational configurations & performance: a comparison of theoretical approaches. *Academy of Management Journal*, 36(6), 1278-1313.

Lant, T. K., & Phelps, C. (1999). Strategic groups: a situated learning perspective, *in* A. Miner & P. Haunschild (Eds.). *Advances in Strategic Management*, 16, 171-194.

Lawless, M. W., & Anderson, P. (1996). Generational technological change: effects of innovation & local rivalry on performance. *Academy of Management Journal*, 39(5), 1185-1217. http://dx.doi.org/10.2307/256996

Lawless, M. W., & Tegarden, L. F. (1991). A test of performance similarity among strategic group members in conforming & non-conforming industry structures. *Journal of Management Studies*, 28(6), 645-664. http://dx.doi.org/10.1111/J.1467-6486.1991.TB00984.X

Lawless, M. W., Bergh, D. D., & Wilsted, W. D. (1989). Performance variations among strategic group members: an examination of individual firm capability. *Journal of Management*, 15(4), 649-661. http://dx.doi.org/10.1177/014920638901500412

Leask, G. (2004). Strategic groups & the resource based view: Natural complements enhancing our understanding of the competitive process. *Working paper*, Ashton Univ., Birmingham, U.K.

Lewis, P., & Thomas, H. (1990). The linkage between Strategy, Strategic Groups, & Performance in the U.K. Retail Grocery Industry. *Strategic Management Journal*, 11(5), 385-397. http://dx.doi.org/10.1002/smj.4250110505

Lippman, S. A., & Rumelt., R. P. (1982). Uncertain imitability: an analysis of interfirm differences in efficiency under competition. *Bell Journal of Economics*, 13(2), 418-438. http://dx.doi.org/10.2307/3003464

Mascarenhas, B., & Aaker, D. A. (1989). Mobility barriers & strategic groups. *Strategic Management Journal*, 10(5), 475-485. http://dx.doi.org/10.1002/smj.4250100506

Mascarenhas, B. (1989). Strategic group dynamics. *Academy of Management Journal*, 32(2), 333-352. http://dx.doi.org/10.2307/256365

Mbengue, A. (1992). *Les Groupes Stratégiques réexaminés: Une approche perceptuelle*, Thèse de doctorat de Sciences de Gestion, Université Paris Dauphine.

McGee, J., & Segal-Horn, S. (1990). Strategic space & industry dynamics: the implications for international marketing strategy. *Journal of Marketing Management*, 6(3), 175-193.

McGee, J., & Thomas, H. (1986). Strategic Groups: theory, research, & taxonomy. *Strategic Management Journal*, 7(2), 141-160. http://dx.doi.org/10.1002/smj.4250070204

McGee, J., Thomas, H., & Pruett, M. (1995). Strategic groups & the analysis of market structure & industry dynamics. *British Journal of Management*, 6(4), 257-270. http://dx.doi.org/10.1111/j.1467-8551.1995.tb00099.x

McNamara, G. M., & Vaaler, P. (2000). The influence of competitive positioning & rivalry in emerging market risk assessment. *Journal of International Business Studies*, 31(2), 337-347. http://dx.doi.org/10.1057/palgrave.jibs.8490910

McNamara, G. M., Deephouse, D. L., & Luce, R. A. (2003). Competitive positioning within & across a strategic group structure: the performance of core, secondary & solitary firms. *Strategic Management Journal*, 24(2), 161-181. http://dx.doi.org/10.1002/smj.289

Mehra, A., & Floyd, S. W. (1998). Product market heterogeneity, resource imitability & strategic group formation. *Journal of Management*, 24(4), 511-531. http://dx.doi.org/10.1016/S0149-2063(99)80071-3

Meyer, J. W., & Rowan, B. (1977). Institutional organizations: formal structure as myth & ceremony. *American Journal of Sociology*, 83, 340-363. http://dx.doi.org/10.1086/226550

Miles, R. E., & Snow, C. C. (1978).*Organizational strategy, structure & process*, McGraw Hill: N-Y.

Miller, D., & Chen, M. (1995). Nonconformity in competitive repertories, *in* D. Moore (Ed.). *Academy of Management Best Papers Proceedings*, 256-260.

Miller, G. A. (1994).What happens after success: The perils of excellence. *Journal of Management Studies*, 31(3), 325-358. http://dx.doi.org/10.1111/j.1467-6486.1994.tb00621.x

Nair, A., & Kotha , S. (2001). Does group membership matter? Evidence from the Japanese steel industry. *Strategic Management Journal*, 22(3), 221-235. http://dx.doi.org/10.1002/smj.154

Nath, D., & Gruca, T. S. (1997). Convergence across alternative methods for forming strategic groups. *Strategic Management Journal*, 18(9), 745-760. http://dx.doi.org/10.1002/(SICI)1097-0266(199710)18:9<745::AID-SMJ925>3.0.CO;2-U

Nelson, R. R. (1991). Why do firms differ, and how does it matter?. *Strategic Management Journal*, 12(S2), 61-74. http://dx.doi.org/10.1002/smj.4250121006

Oliver, C. (1997). Sustainable competitive advantage: combining institutional & resource-based views. *Strategic Management Journal*, 18(9), 697-713. http://dx.doi.org/10.1002/(SICI)1097-0266(199710)18:9<697::AID-SMJ909>3.0.CO;2-C

Oster, S. (1982). Intraindustry structure & the ease of strategic change. *Review of economics & Statistics*, 64(3), 376-83. http://dx.doi.org/10.2307/1925935

Peteraf, M., & Shanley, M. (1997). Getting to know you: a theory of strategic group identity. *Strategic Management Journal*, 18(S1), 165-186. http://dx.doi.org/10.1002/(SICI)1097-0266(199707)18:1+<165::AID-SMJ914>3.0.CO;2-#

Peteraf, M. A. (1993). Intra-industry structure & the response towards rivals. *Managerial & Decision Economics*, 14(6), 519-528. http://dx.doi.org/10.1002/mde.4090140605

Pfeffer, J., & Salancik, G. (1978). *External control of organizations: a resource dependent perspective*, Harper & Row.

Porac, J. F., Thomas, H., & Baden-Fuller. C. (1989). Competitive groups as cognitive communities: the case of Scottish knitwear manufacturers. *Journal of Management Studies*, 26(4), 397-416. http://dx.doi.org/10.1111/j.1467-6486.1989.tb00736.x

Porac, J. F., & Thomas, H. (1990). Taxonomic Mental Models in Competitor Definition. *Academy of Management Review*, 15(2), 224-240.

Porac, J. F., Thomas, H., Wilson, F., Paton, D., & Kanfer, A. (1995). Rivalry in the industry model of Scottish Knitwear producers. *Administrative Science Quarterly*, 40(2), 203-227. http://www.jstor.org/stable/2393636

Porter, M. E (1979). The structure within industries & companies' performance. *Review of Economics & Statistics*, 61(2), 214-227. http://dx.doi.org/10.2307/1924589

Porter, M. E. (1980). *Competitive Strategy: techniques for analyzing industries & competitors*, Free Press: N-Y.

Porter, M. E. (1991).Towards a dynamic theory of strategy. *Strategic Management Journal*, 12(8), 95-112. http://dx.doi.org/10.1002/smj.4250121008

Reger, R. K., & Huff, A. S. (1993). Strategic Groups: A cognitive perspective. *Strategic Management Journal*, 14(2), 103-124. http://dx.doi.org/10.1002/smj.4250140203

Reger R. K. (1990). Managerial thought structures & competitive positioning, *in* A. S. Huff (Ed.). *Mapping strategic thought*, Chichester: John Wiley & Sons, 71-88.

Rumelt, R. (1984). Toward a strategic theory of the firm, *in* R. Lamb (Ed.). *Competitive Strategic Management*, Prentice Hall, Englewood Cliffs, NJ, 556-570.

Scherer, F. M., & Ross, D. (1990). *Industrial market structure & economic performance*, Houghton Mifflin.

Scott, W. R. (1981). *Organizations: Rational, Natural & Open Systems*, Englewood Cliffs, NJ: Prentice-Hall.

Scott, W. R. (1995). *Institutions & Organizations*, Sage Publications.

Schreyogg, J., & Von Reitzenstein, C. (2008). Strategic groups & performance differences among academic medical centers. *Health Care Management Review*, 33(3), 225-233.

Short, J. C., Ketchen, D. J., Palmer, B. T., & Hult, T. M. (2007). Firm, strategic group, & industry influences on performance. *Strategic Management Journal*, 28(2), 147–167, http://dx.doi.org/10.1002/smj.574

Singh, J. V., Tucker, D. J., & House, R. J. (1986). Organizational legitimacy & the liability of newness. *Administrative Science Quarterly*, 31(2), 171-193 http://www.jstor.org/stable/2392787

Spender, J. C. (1989).*Industry Recipes: An Enquiry into the Nature & Sources of Managerial Judgement*, Blackwell, Oxford.

Stigler, G. J. (1964). A theory of oligopoly. *Journal of Political Economy*, 72, 44-61. http://dx.doi.org/10.1086/258853

Suchman, M. C. (1995). Managing legitimacy: strategic & institutional approaches. *Academy of Management Review*, 20(3), 571-610.

Thomas, H., & Carroll, C. (1994).Theoretical & empirical links between strategic groups, cognitive communities, & networks of interacting firms, *in* H. Daems & H. Thomas (Eds.). *Strategic Groups, Strategic Moves, & Performance*, Oxford: Pergamon Press, 7-31.

Thomas, H., & Pollock, T. (1999). From I-O Economics' S-C-P Paradigm Through Strategic groups to Competence-Based competition: reflections on the puzzle of competitive strategy. *British Management Journal*, 10(2), 127-140. http://dx.doi.org/10.1111/1467-8551.00115

Thomas, H., & Venkatraman, N. (1988). Research on strategic groups: progress & prognosis. *Journal of Management Studies*, 25(6), 537-555. http://dx.doi.org/10.1111/j.1467-6486.1988.tb00046.x

Tywoniak, S., Galvin, P., & Davies, J. (2007). New institutional economics' contribution to strategic groups analysis. *Managerial & Decision Economics*, 28(3), 213–228. http://dx.doi.org/10.1002/mde.1323

Weick, K. E. (1979). *The Social Psychology of Organizing*, Reading MA: Addison Wesley.

Wernerfelt, B. (1984). A resource based view of the firm. *Strategic Management Journal*, 5(2), 171-180. http://dx.doi.org/10.1002/smj.4250050207

Wood, D. J. (1991).Corporate social performance revisited. *Academy of Management Review*, 16(4), 691-718.

Yami, S., & Benavent, C. (2000). Rivalité et groupes stratégiques: une revue de la littérature et un cadre d'analyse. *Communication à la IXème Conférence Internationale de Management Stratégique,* Montpellier.

The Emergent Medical Tourism: Advantages and Disadvantages of the Medical Treatments Abroad

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Abstract

Nowadays, Medical Tourism (MT) greatly develops, has received public reputation and becomes a new Tourist niche. Nevertheless, MT is still a badly known and not sufficiently studied phenomenon. MT represents 2 % of the world Tourism and 4 % of the hospital admissions in the world: it generates a 100 billion € fallout engendered by 20 million of medical tourists (Mt). The MT is appealed to develop considering the growing life expectation and the technological and medical surgical progress. It is other globalization effect and come within the framework of Social Security (SS) deficits and of reorganization of the public and private health systems in many countries. The challenge will be how to improve the quality (of the care)/price (reduced) ratio without falling in the drift of a two-speed SS medicine. We discuss the advantages and drawbacks of the MT concerning the patients, the country suppliers and the receiving countries.

Keywords: Medical tourism, Health tourism, Tourism, Plastic surgery, Medical treatment abroad, Organ transplants

1. Introduction

During the XIXth and the first half of XXth centuries, the thermal tourism had a remarkable development and became accessible to the well-to-do social classes. In the second half of XXth s, this tourism of health develops and allows the middle classes to reach it. At the same time, the other forms of tourism related with the health appear, as the "anti-aging" medicine, the "Medical Spa" and the Medical Tourism (MT) allowing the access to new treatments, fruits of the remarkable scientific and technological development in the medical domain. This profusion of medical practices entailed confusion of genres. In this work we shall analyze the advantages and the disadvantages of the Medical Tourism, which is a still a badly known and little studied phenomenon.

We distinguish here the Health Tourism (HT), which takes care of the "well-being" (thermal baths, thalassotherapy and balneotherapy; INSEE, 2005), of the Medical Tourism (MT) where the "medical tourist" (Mt) plans alone or with his regular doctor, the medical or surgical protocol the most adapted to make abroad. Therefore, the MT concerns more health than tourism.

In spite of a lack of statistical data, we estimate that it represents about 2 % of the world Tourism (OMT/UNWTO 2009, 2011) and also, about 4 % of the hospital admissions in the world: it is marginal without being unimportant. With 100 billion € fallout engendered by 20 million of Mt in the world, the medical tourist activities will increase in the future, considering the growing of life expectation and of technological and medical surgical progress. The MT constitutes a dynamical economic factor for foreign countries influencing the local creation of employments related both to the tourism and to health services.

The MT is an additional effect of globalization and it places in the current context of the Social Security (SS) deficits and of the reorganization of the public and private health systems in many countries. It constitutes a challenge: how to improve the "quality of the care"/"reduced prices" without falling in the drift of a medicine and SS with a two-speed health system and how to avoid the derived ethical and legal problems?

The HT and the MT share the same general characteristics (short-term stay abroad) of the Tourism (Spörel &Täube, 2008) because tourists make a trip and a stay of duration going from an overnight stay to one year (Antczaket & Le Garrec, 2008), without considering their usual movements. In French Tourism statistics, general health is considered as one of tourist motivations: holidays, business, official missions, congresses and health. The MT is absent in this classification, but it must be recognized its specificity because the main motivation is medical and not touristic, as it is also the case of the business tourism for which the main motivation is business.

2. Definitions of HT and MT

In the HT (thermal baths, thalassotherapy and balneotherapy) we include all the noninvasive (external) treatments allowing an improvement of the health or the mind of the patient and/or the person having hydrotherapy. Most of the activities connected with this tourism concern the well-being of the patients, which contributes obviously to their good state of general health. Some of these activities have a role rather medical, as it is the case of the specific treatments for the asthmatics and the thalassotherapy to relieve the rheumatism.

On the other hand, in the MT we include all the invasive (Note 1) treatments necessary for the cure of heavy diseases as well as all the surgical operations independently of the searched objectives (curative, palliative or aesthetic care).

Nevertheless, we consider that all which concerns with a heavy pathology, where generally the vital prognosis of the patient is engaged, should be placed under the medical and surgical responsibility of the country of origin of the patient and not of foreign health services. For example: the mammary reconstructions (not aesthetic plastic surgery) made after a complete ablation of the breast due to a cancer, the reconstruction of the nose or a part of the face after an accident, a grave traumatism or a serious illness, should cannot concern from the domain of the MT.

On the contrary, the aesthetic plastic surgery and some supplementary post surgical stages, such as sessions of chemotherapy or of radiotherapy of some cancers or the heavy, long-term medical protocols or treatments demanding the presence of a team of experienced specialists, will be able to be realized abroad, in a MT frame.

Therefore, we propose the following operational definition of MT (Anido Freire, 2010a):

Medical Tourism is the one who links two very different objectives: from one side, to benefit of medical interventions performed in foreign countries and from the other, and if possible, tourist visits of these foreign countries.

The MT not only concerns the Western patients, as could be deduced from the announcements of the agencies (Note 2) of MT on Internet, but also, numerous patients around the world who move towards developed or underdeveloped countries, practising MT.

In some European studies, the MT is rather presented as a "mobility of patients" in the same way as the "mobility of workers" established inside the EU and as far as we consider that most of the foreign patients are coming from a country of the European Union (De Greef & Thomaes, 2006).

Otherwise, the MT is also presented "as a business of medical services" whose volume of transactions is counted in the balance of payments (CNUCED/UNCTAD, 1997b) of some countries, into the section "health-related travel". The United Nations (2002) defines the "health-related expenditure" as "total expenditure by those travelling for medical reasons".

Generally, these statistics do not take into account:

- medical spending of people travelling for other motives and which suddenly needs medical care during their stay abroad,

- spending of paramedical acts such as analyses and clinical examinations,

- telemedicine services,

- services brought occasionally by doctors during a journey abroad (OCDE/OECD, 2009, 2011).

The exports (Note 3) of a country concerning the "journeys for medical motives" (health-related transactions), result from payments made for local medical services, returned by not resident foreigners arrived at this country with the obvious intention to be treated. While the imports, result from spending of the nationals abroad when they go to other countries with these same intentions (OCDE/OECD, 2009, 2011).

The double label of "tourism" and "medical" implies that the MT should be studied at the same time from the statistics of the tourism and those of the health, to be able to cross check the available data. At present, the only available data are the ones established by private agencies of consultants entrusted, among others, to establish reports on the current socioeconomic problematic, and the beneficiaries of which can be other companies or governmental agencies which try to establish diagnoses or forecasts, or to make predictions according to their own interests.

On the other hand, the HT is statistically better defined because its activities are made, generally in well-identified establishments (thermal baths, thalassotherapy, etc.) and connected for a long time to the Ministry of the Tourism of every country. But at the moment, this type of activities becomes difficult to quantify because of the Spa installed in many establishments (hotels, leisure centres, etc.), not necessarily specialized in the health field, where either it is

relegated to the role of secondary or supplementary activity or to diversify and complete their principal activities (hotel business, leisure activities).

The importance of the MT is given by the number of patients going abroad for medical care: De Greef & Thomaes (2006) estimate this number in 19 millions a year. If we compare this number with the total number of tourists (908 millions) in the world (OMT/UNWTO, 2009, 2011), the MT would represent 2 % in number and 4 % of tourist spending.

The English statistics consider that the total number of medical tourists who enter the United Kingdom is equivalent to that of English people going out, even if their medical objectives are certainly different. In France the EVE Survey on the Foreign Visitors led at the airports of Paris (EVE 2009, Ile-de-France) establishes that 2 % of the foreign tourists have for motivation, reasons of health and medical care. If only 10 % of this last category of tourists come to France in the framework of the MT, the number of foreign Mt in France (receiving country) can be then estimated between 70 000 and 210 000 Mt or 0.1 % and 0.3 % of the total number of tourists (Antczaket & Le Garrec, 2008).

Because of the free circulation inside the EU, nobody control either the origin or the motivation of the European nationals on the frontiers. Furthermore, the medical data are not suitably centralized for allowing to know the number of foreigners admitted in hospital centres, within the framework of a MT or within the framework of agreements with, for example, the health services of the ancient colonies or within the framework of the legal and clandestine (Note 4) immigration. We know even less, the number of foreign patients being looked after in private hospitals or by private doctors. But generally, some studies neglect the volume of these activities in front of those of the public service.

We shall approach now the advantages and the disadvantages of the MT, at first for the medical tourists (Mt), then for the country supplier of these Mt and finally, for the receiving country of Mt.

3. Advantages of the MT for the Mt

The Mt invokes different reasons and advantages to be treated abroad (Anido Freire, 2010a, 2010b).

(a) The cost proposed by the offer of the care abroad, plus those of the trip and the stay, is lower (Table 1) than the cost of only the care realized in the country of origin, taking into account the possible refunds of the health insurance.

(b) When the required treatment is not available, or not taken care, or is not partially covered by the health insurance of the country of origin, it is better to be treated abroad.

(c) The quality/price ratio is more favourable abroad (CNUCED/UNCTAD, 1997a): many foreign hospitals and foreign private clinics employ doctors trained and qualified in the western countries.

(d) The possibility of associating "body care" and "tourism" but also "to join the useful and unpleasant, with the pleasant" and allowing "to swallow the pill" more easily, because of the foreign exoticism which will allow the Mt to integrate the unpleasant memories with the pleasant ones.

(e) A change of scenery (change of place and maybe country, change of climate and culture) and the leisure activities associated with tourism, or a convalescence in a luxury hotel, would allow him to surmount more easily its sufferings before and after the application of the care, by compensating a thing with other one.

(f) Be able to "mask" an intervention, for example of plastic surgery, under a tourist journey, because the treatment concerns the domain of the intimacy; it thus allows to keep the "secret" of that intervention.

Insert Table 1 Here

According to the nationality of the medical tourist or the type of envisaged medical treatment, other additional benefits are possible:

- to reach quickly the care and not be forced to stay on a waiting list during some months in the country of origin,

- to do not frequent private hospitals or national hospitals having an important rate of light or serious infectious contagions (hospital-borne diseases),

- to be looked by the most famous doctors,

- to be able to follow the fashion of canons of beauty: plastic surgery (bosoms, face, belly, buttocks, etc.),

- to have the opportunity to reach these cares,

- to be proud to have managed to be looked abroad,

- to have the possibility to choose freely the most convenient moment to leave home to be treated abroad because it is not forced by a precise period of the year such as that of the holidays, related to the calendars of every country. Any temporary touristic migration is similar to that of the potential emigrant who is going to take freely the decision to emigrate (Anido, 1976; Anido & Freire, 1977).

If the journey takes place inside the Schengen area, there is a European legal frame that allows to benefit (UE/EU, 2008, 2011) from quality care in another European country (free circulation of European citizens), by choosing freely the clinic and the doctors to be looked. It specifies the rights of the patients and the duties (responsibilities) of the suppliers of health care, in a general frame of medical ethics. The European legislation established the equality of access, of treatment and care, of safety and appeal of the national and foreign patients having undergone damages. This legislation completes the national one of every country of the EU and suggests a greater surveillance of all the public and private actors in health fields.

These rights are framed by procedures (UE/EU, 2008, 2011) where are involved the Social Securities of both countries; the European patient has to respect them if he will claim to benefit from reimbursements (Note 5) of medical expenses as if he had stayed in his country of origin.

The generalization of the use of the European card (Note 6) of health insurance (in replacement of the form E112) and the establishment of a coordinated care, aim to simplify the access of the citizens of the 27 states member of the EU, Iceland, Liechtenstein, Norway and Switzerland to the health care services during their temporary visit abroad. Furthermore, the EU approved (Note 7) a legislative package, which established in May 2010 a modernized coordination of the national systems of Social Security to help the tourists, the mobile workers, the researchers of employment and the pensioners.

4. Disadvantages of the MT for the Mt

The attractive MT option that offers simultaneously tourism and health care, can nevertheless bring some health disadvantages (Anido Freire, 2010a, 2010b).

(a) Generally, "sun, sea and sand tourism" is not recommended after a surgery, but the Mt can make tourism before the planned intervention, especially when is accompanied by a relative.

(b) Any medical intervention is risked: the possible post-operative complications can increase the invoice if it is necessary to remain abroad to treat them. Complications can appear at the time of return to the country of origin, due to, among others, a traumatism or a secondary infection during the journey. Therefore, the care abroad can then turn out less profitable (Cohen, 2009) than a care made in the country of origin.

(c) The accompaniment of local paramedical activities (clinical analysis laboratories, centres of radiology, medical imaging and interpretation) can have a lower quality than that of local doctors. The problem is that it is only during the stay that the Mt can judge it.

(d) The medical follow-up cannot be maintained abroad by the medical team, which practiced the interventions, unless coming again. It is the case of the false teeth requiring at least five or six fittings to make sure of a correct result.

(e) The medical follow-up after the intervention has to continue in the country of origin, at his expenses or in a public institution that agrees to take care of him.

(f) It is not certain that the foreign doctor makes a commitment to repair the damages of his surgical act (Dawson & Pollard, 2007). Thus, the MT is interested in taking out an additional insurances, even though that will increase the final invoice, to make sure of the good progress during his hospital and touristic stay: any legal action against the private hospital will have to be made according to the legal codes of the foreign country.

(g) There is a possibility of contracting a hospital-borne disease due to the lack of asepsis or of hygiene in private and foreigners hospitals, or of contracting an endemic or seasonal disease (chikungunya, malaria, SRAS) in the foreign country and absent in the country of origin. Certainly, these are individual cases revealed by the written and oral media (Note 8).

5. Advantages for the Country Supplier of Mt.

(a) The development of the MT allowed the medical industry of developed countries to export their products and their know-how (installations, organization and pharmaceutical industry) towards the emergent countries that hope to develop MT, so contributing to the exports and to improve their balance of payments.

(b) The inter-European MT is going to grow and poles of speciality (dental, aesthetic or cardiac surgeries, cancer research, etc.) are being developed in some countries.

(c) The MT allows the health organizations to dispose of financial sources besides the public financing, especially when a foreign fortunate clientele is concerned.

(d) The western countries and in particular the EU will be confronted with the financial consequences of the ageing of the population. Perhaps, older patients will be faced either to accept a reduction of the medical services or to decide be looked abroad (out of the EU), to reduce their expenses and to relieve at the same time the national budget of the health.

(e) But it is as well possible that they lead to a development policy of the services of Geriatrics to satisfy, not only the needs of health of European patients but also of foreign seniors which in this way, can bring a complement to financing (Note 9) the health sector.

In this last case, we can even envisage general economic fallout, such as a global improvement of the labour market and more particularly of that of the health workers. De Greef & Thomaes (2006) estimate that Belgium would be able to create in the short-term, up to 6.000 jobs for the health workers and 380.000 jobs in related branches, in the case of a voluntary policy to develop the MT.

(f) In addition, the new technologies applied to the medical care (De Greef & Thomaes, 2006), in particular those centred on telemedicine (CNUCED/UNCTAD, 1997a), can constitute an important factor in the growth of MT, because they allow European doctors to follow remotely an already looked Mt, and they contribute to the good realization of surgeries abroad by doctors who will can, in case of emergency or complications, appeal the best specialists of the developed countries.

These new methods of work will be possible thanks to:

- the use of remote automated and remote-controlled medical equipments,

- the consultations and the surgical operations by videoconferencing,

- the remotely interpretation of medical analyses or radiological examinations (e.g. scanners),

- the TV-monitoring (permanent remote control of the health of the patient stayed at home).

6. Disadvantages for the Country Supplier of Mt.

(a) Developed countries have financial losses because of the development of the MT and the HT out of borders. At the moment it is not the case of France where the financial losses are unimportant. For the European countries, as far as the MT and the HT take place inside the European Union, they contribute to redistribute a certain wealth among the various European partners.

(b) The MT and the HT towards the rich countries also developed what confirms the global aspect of these flows (Note 10) of Mt. At present, the financial contribution of the foreign patients does not compensate the financial losses of the nationals that leave abroad, because their number is much lower. Their growth is also less important as that of the nationals which leave towards the foreign countries.

(c) The growth of the MT towards foreign countries benefits from the image of the country as a pleasant touristic zone and brings an additional dimension to the classic tourism. Thus, the Tourism and the MT interact in a dynamic way by leaning the one on the other one to develop.

(d) Certainly there will be an increase of the international mobility (CNUCED/UNCTAD, 1997a, 1997b; Dumont & Zurn, 2007; Martin, 2007) of the medical and paramedical staff towards places where they can exercise their profession in good conditions (recognition of their abilities and profit of a good salary).

(e) The MT is going to reinforce the tendency to privilege very elaborated and hyper specialized hospital infrastructures, which already met the expectations of a minority of rich patients. The increase of the number of specialists in detriment of general practitioners (OMS/WHO 2008), risks to become more marked.

(f) The MT contributes to pandemics. The movement of persons and goods for commercial or touristic reasons caused in the world an acceleration of the transmission of diseases (SRAS, H1N1) and the hospital-borne infections (Walker et al., 2009). The development of the MT contributes to spread diseases but, the most redoubtable is the emergence of hospital-borne diseases (Note 11) and imported by Mt pursuing a treatment after a stay abroad, as has already noticed in some European hospital centres (EARSS, 2009).

(g) The MT and the HT towards the rich countries can stagnate, even decrease, if foreign Mt turns away towards other competitive foreign medical destinations having built their reputation over the years.

(h) In many OCDE/OECD countries the number of doctors for one thousand inhabitants decreased during these last years (CNUCED/UNCTAD 1997a; OCDE/OECD, 2008a, 2008b). The OCDE/OECD average of the number of doctors by one thousand inhabitants is 2.9 and in France this number decreased (3.4 in 2007; 3.2 in 2008) and will reach a plateau of 2.9 around the year 2030 (DRESS, 2002, 2009). To mitigate this situation, there has been to appeal to foreign doctors (Dumont & Zurn, 2007).

(i) There is a risk of the increase of prices of the medical acts as well as a decrease of their refund, what can lead to the appearance of a two-speed (Note 12) health: those who succeed in paying a journey abroad to be looked cheaper and quickly, and those who have no means to pay these care, neither where they live nor abroad, and that have to wait for a long time to reach health care.

(j) The MT reveals the incongruities and the injustices emanating from the legislation or the current practices of our health services. Some treatments or interventions are only accessible abroad because of the too constraining or traditionalist legislations of our developed countries. The very existence of the MT constitutes an alarm cry to not only make evolve the customs, but also to change laws in our countries. The official refusals undergone by the patients for some treatments are felt as an infringement on their freedom to be able to dispose freely of their body and to decide on the way of managing their intimacy and their life.

The most sensitive subjects, and which still raise legal problems, revolve around those concerning death (euthanasia), sex or that have a sexual connotation:

- abortion,
- artificial insemination,
- surrogate mothers,
- mammary implants,
- surgery of the penis,
- change of sex.

7. Advantages for the Receiving Country of Mt

(a) The recent development of the MT led to that of the medical structures of the emergent countries, not only regarding infrastructures, medical equipments and instrumentation but also professional (setting up of numerous doctors, nurses, ambulance drivers and other paramedical jobs); quality of services, better salaries, improvement of the education and the local medical research. This allows to fix the medical staff on their country, by avoiding that doctors emigrate to exercise their job more suitably (CNUCED/UNCTAD, 1997a) and, at the same time, to facilitate the return of those who had left abroad. Additionally, MT can help to decrease the "brain drain" (Martin, 2007), at least in the medical domain. This is an additional asset to develop (Note 13) the MT.

(b) On the other hand, other countries will take advantage to improve and develop their health system with the financial godsend brought by the Mt, what will allow them to increase the number of the beneficiaries (CNUCED/UNCTAD, 1997a) of the health care of the country.

(c) Some countries will develop (Pitti, 2009) more specific medical activities (Martin, 2006) to become the best in these domains and, in this way, thwart the competition (CNUCED/UNCTAD, 1997c) of the other countries which will then be obliged to specialize in other medical sectors.

(d) They can benefit from the increase of the international mobility (Dumont & Zurn, 2007; Martin, 2007) of the medical and paramedical staff towards countries where they can exercise their profession in good conditions (recognition of their skills and profit of a good salary).

(e) Many emergent countries are betting on MT to boost regional and national tourism to increase the economic fallouts and ameliorate their labour market (hospitality, restaurants, transports, services, infrastructures, etc.).

8. Disadvantages for the Receiving Country of Mt

(a) Numerous doctors of developing countries leave (CNUCED/UNCTAD, 1997a) the public hospitals to set up themselves privately or join a team of a private clinic, to earn better their living and have a better professional recognition.

Thus, the economic indicator "number of doctors or medical staff per capita" will not have any sense because its increase will not measure any more an improvement of the living conditions in the country, because these doctors will dedicate themselves to a foreign clientele and not to a local one.

(b) Risk of contribution to the traffic of organs. Poor people in under developed countries are tempted to sell their own organs in exchange of money to ameliorate their life.

(c) Risk to facilitate the forgery of medicines. The search for the reduction of the expenses of the interventions abroad could facilitate the demand, the production and the distribution of the forgery of medicines. The foreign patients could be tempted to buy them abroad, outside the official circuits (laboratories, pharmacies) to bring them in their country of origin.

(d) Risk of facilitating the marketing of equipments and lower-quality prostheses or of forgeries. To guarantee a lesser cost for the Mt, some foreign hospital centres could use this type of products.

9. Conclusions

Most people see in the MT only advantages (saving of time and money, excellence of the quality of the services of the professionals of health, the possibility of benefiting from a few hours or days of secondary touristic activities). Thus, they often forget that the MT can also have a lot of inconveniences. The first thing, which it is advisable to remind, is that the zero risk does not exist in General Medicine and even less in surgery, independently of the country where the intervention is realized.

The MT is rather a consequence of an inadequacy between the supply and demand of health care in a country, what leaves an opened door to offers resulting from the foreign countries and in this manner, joining the context established by globalization. Since MT is a personal and individual decision of the medical tourist, the MT can currently be considered neither as Exporting nor as outsourcing. Indeed, in this emerging niche of tourism there are no subcontracting or outsourcing/externalization, or bilateral agreements or contracts with health companies.

For countries suppliers and for the receiving countries of Mt, the MT can bring financial advantages and improvements of the National Health Service, allows market the sophisticated medical equipments and contributes to develop touristic industries. But it can also bring financial disadvantages (lesser spending of health in the country of origin) or risks of contribution to the traffic of organs or facilitate the forgery of medicines (receiving countries).

The MT is thus a complex phenomenon, at the moment difficult to delimit completely. The lack of reliable data and official statistics resulting from Ministries of Health and of Tourism, does not allow to estimate globally the importance of the MT.

The estimations of some analysts let think that the MT will develop more in the short term, while remaining marginal as well, regarding the global volume of the Tourism (2 %) and the volume of care administered in hospital centres (4 %).

We consider that the EU should quickly react in front of this specific "migratory" phenomenon, develop a better coordination of the policies of care management and welcome of the patients and then, take advantage of this financial godsend to strengthen the excellence of some European hospital centres.

References

Anido, N. (1976). *L'émigration portugaise: 1950-1974*, Thèse de Doctorat, Université de Paris III, Sorbonne, Paris.

Anido, N., & Freire, R. (1977). *L'émigration portugaise. Présent et avenir*, pp. 197, Paris, PUF.

Anido Freire, N. (2010a). L'essor du Tourisme Médical: joindre l'utile à l'agréable ?, *CRISC* n 26, pp. 10-62, March 2010, Paris.

Anido Freire, N. (2010b). *Medical treatments abroad: the emergent Medical Tourism,* oral communication, 13th Biennal Congress ESHMS, Ghent, Belgium, 26-28/8/2010.

Antczaket M., & Le Garrec, M.-A. (2008). Les visiteurs étrangers en France in *Le tourisme en France, Édition 2008*, INSEE, pp. 41-51. [Online] Available: http://www.insee.fr/fr/themes/document.asp?reg_id=0&ref_id=fratour08d; http://statistiques-tourisme.gouv.fr.

CNUCED/UNCTAD (1997a). *Le commerce international des services de santé: difficultés et possibilités qui se présentent aux pays en développement***,** Note d'information du secrétariat de la CNUCED, sur la *Réunion d'experts sur le renforcement des capacités et l'accroissement des exportations des pays en développement dans le secteur des services: services de santé* du 16-18 juin 1997, Genève, pp. 29, 7 avril 1997. TD/B/COM.1/EM.1/2 [Online] Available: http://www.unctad.org/Templates/Search.asp?intItemID=2068&lang=2&frmSearchStr=services+de+sant%E9&frmCategory=all&section=whole, clem1d2.fr.

CNUCED/UNCTAD. (1997b). *Rapport de la réunion d'experts sur le renforcement des capacités et l'accroissement des exportations des pays en développement dans le secteur des services: services de santé***,** Genève, 16 au 18 juin

1997, 16 p., 1er juillet 1997, Genève [Online] Available: http://www.unctad.org/Templates/Search.asp?intItemID=2068&lang=2&frmSearchStr=services+de+sant%E9&frmCategory=all&section=whole, clem1d3.fr.

CNUCED/UNCTAD. (1997c). *Mondialisation, Concurrence, Compétitivité et Développement***,** Conseil du Commerce et du Développement, quarante-quatrième session, Genève, 14 octobre 1997, pp. 14, TD/B/44/15 [Online] Available: http://www.unctad.org/Templates/Search.asp?intItemID=2068&lang=2&frmSearchStr=mondialisation%2C+concurrence&frmCategory=all&section=whole, tb44b15.fr.

Cohen, T. (2009). Medical Treatment Abroad: Is it a false economy?, *The Telegraph*, UK [Online] Available:

http://www.telegraph.co.uk/health/6030188/Medical-Treatment-Abroad-Is-it-a-false-economy.

Dawson, S., & Pollard, K. (2007). *Guide to medical tourism*, Intuition Communication Ltd. (www.treatmentabroad.net), pp. 17, UK.

De Greef, S., & Thomaes, R. (2006). *Dare & Care (Audace et Soins), Internationalisation du secteur médical belge*, pp. 68, FEB (Fédération des Entreprises Belges).

DRESS (Direction de la recherche, des études, de l'évaluation et des statistiques) (2002). La démographie médicale à l'horizon 2020: de nouvelles projections nationales et régionales, *Etudes et résultats*, n 57, pp. 8, Paris.

DRESS (Direction de la recherche, des études, de l'évaluation et des statistiques) (2009). La démographie médicale à l'horizon 2030: de nouvelles projections nationales et régionales, *Etudes et résultats*, n 679, pp. 8, Paris.

Dumont, J.-C., & Zurn, P. (2007). Les personnels de santé immigrés dans les pays de l'OCDE dans le contexte général des migrations de travailleurs hautement qualifiés, Partie III, pp. 74, in *Perspectives des Migrations Internationales,* SOPEMI, OCDE.

EARSS (European Antimicrobial Resistance Surveillance System). (2009). *Annual Repport 2008*, pp. 180, The Netherlands.

EVE. (2009). *Enquête auprès des visiteurs étrangers aux aéroports ... Santé, soins médicaux. Bilan de l'année touristique 2008***,** Le nouveau Paris, Ile-de-France, Dispositif permanent d'enquête aux aéroports, pp. 52. [Online] Available: www.nouveau-paris-ile-de-france.fr/fichiers/.../Dispositif_ADP_2009.pdf

INSEE. (2005). *Fiches thématiques, Le tourisme en France,* pp. 122, Paris. [Online] Available: www.insee.fr/fr/ppp/sommaire/FRATOUR05.PDF

Martin, D. R. (2006). Challenges and Opportunities in the Care of International Patients: Clinical and Health Services Issues for Academic Medical Centers, *Academic Medicine*, 81(2), 189-192. [Online] Available: http://journals.lww.com/academicmedicine/pages/articleviewer.aspx?year=2006&issue=02000&article=00016&type=fulltext

Martin, J. P. (2007). Fuite des cerveaux dans le secteur de la santé: mythes et réalités, Editorial (4 p.) in *Perspectives des Migrations Internationales*, SOPEMI, OCDE.

OCDE/OECD. (2008a). Les personnels de santé dans les pays de l'OCDE: comment répondre à la crise imminente?, *Etudes de l'OCDE sur les politiques de santé*, pp. 11. [Online] Available: http://www.oecd.org/dataoecd/25/11/41511074.pdf

OCDE/OECD. (2008b). Les personnels de santé dans les pays de l'OCDE: comment répondre au risque imminent ?, 14 pp. [Online] Available: http://www.oecd.org/dataoecd/25/10/41511259.pdf

OCDE/OECD. (2009). *Panorama de la santé 2009***,** Chapitre 7. Dépenses de santé et financement, 7.7 Commerce international des services de santé (tourisme médical), pp. 200. [Online] Available: http://www.oecd.org/sante/panoramadelasante

OCDE/OECD. (2011). *Panorama de la santé 2011***,** Chapitre 7. Dépenses de santé et financement, 7.6 Commerce international des services de santé (tourisme médical), pp. 200. [Online] Available: http://www.oecd.org/sante/panoramadelasante

OMS/WHO. (2008). *Rapport sur la santé dans le monde 2008: Les soins de santé primaires: maintenant plus que jamais*, pp. 148. [Online] Available: http://www.who.int/whr/2008/fr/index.html

OMT/UNWTO (2009). *Faits saillants du Tourisme,* pp. 12. [Online] Available: UNWTO_Highlights09_fr_LR.pdf

OMT/UNWTO. (2011). *Faits saillants du Tourisme,* pp. 12. [Online] Available: unwtohighlights11frlr_1.pdf

Pitti, F. (2009). Chine et Inde: vers une stratégie de marque, *En Temps Réel*, 38, April 2009, pp. 34. [Online] Available: http://entempsreel.com/2009/05/05/chine-et-inde-vers-une-stratégie-de-marque

Spörel, U., & Täube, V. (2008). *Tendances du tourisme en Europe et dans les Pays Partenaires Méditerranéens, 2000-2006*, EUROSTAT, pp. 8. [Online] Available: http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-08-095/FR/KS-SF-08-095-FR.PDF; http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/publication?p_product_code=KS-SF-08-095

UE/EU. (2008). Un cadre communautaire relatif à l'application des droits des patients en matière de soins de santé transfrontaliers, communication of the European Commission, 2 July 2008 (COM2008415_fr.pdf), pp. 12.

UE/EU. (2011). Directive 2011/24/UE du Parlement Européen et du Conseil du 9 mars 2011 relative à l'applic.ation des droits des patients en matière de soins de santé transfrontaliers, pp. 21.

United Nations. (2002). *Manual on Statistics of International Trade and Services*, pp. 190. (ST/ESA/STAT/SER.M/86).

Walker, H., Brooker, T., & Gelman, W. (2009). Abdominal wall reconstruction following removal of a chronically infected mid-urethral tape, *International Urogynecology Journal,* 20(10), 1273-1275. http://dx.doi.org/10.1007/s00192-009-0852-7

Woodman, J. (2008). *Patient Beyond Border*, 2nd ed., pp. 408, Healthy Travel Media, NC, USA.

Notes

Note 1. The "invasive" qualifier is used here in the sense of the introduction of an external agent in the body to carry out a care impossible to be realized with external treatments ("not invasive").

Note 2. http://agences-voyages.blogspot.com/2007/01/le-tourisme-médical-un-phénomène.html, 03/01/2007.

Note 3. "The experts recognized that the movement of consumers was, for developing countries, a mode of delivery offering considerable possibilities to the export" (ii. *Questions relatives au traitement de patients étrangers*, CNUCED/UNCTAD, 1997b).

Note 4. The number of patients, being clandestine immigrants and that benefit of the AME (Medical care of the State) and being treated in French hospitals, are estimated to be 200 000. These patients cannot reach the CMU ("Couverture Médicale Universelle", Free universal health care).

Note 5. "Prise en charge des soins reçus hors de France: Mon institution d'assurance maladie prend-elle en charge les dépenses correspondant à mes soins de santé dans un autre État européen ?", Coverage of the care received outside France: does my institution of health insurance take care the spending corresponding to my health care in another European State? (http://www.securite-sociale.fr/textes/maladie/etranger/rembetranger_ue.htm).

Note 6. European Commission, "Emploi, affaires sociales et égalité des chances"

(http://ec.europa.eu/social/main.jsp?catId=559&langId=fr).

Note 7. "Soins programmés" (http://ec.europa.eu/social/main.jsp?catld=569&langld=fr) 30/07/2009 (m09_353_fr.pdf).

Note 8. Le tourisme médical: patient ou client ? (Medical Tourism: patient or customer ?) Un film inquiétant sur les dérives de la médecine business (http://www.vodeo.tv/19-35-3587-le-tourisme-medical-patient-ou-client--.html), France 5 TV, Mondialisation et santé: Le tourisme médical (http://www.telleestmatele.com/article-29877805.htm).

Note 9. Supposing that the average spending of Tm is of the order of 7.000 € (Deloitte report), the French health services could receive a minimum of 10 000 Tm with a 70 million € budget. Other countries have already developed official agencies to attract Tm (CNUCED/UNCTAD, 1997a).

Note 10. A well-known phenomenon in Human Migrations where all the countries behave as suppliers and receiving of migrants (Anido & Freire, 1977).

Note 11. Such as those provoked by: Staphylococcus aureus, Klebsiella pneumoniae, Escherichia coli, Enterococcus faecium, Enterococcus faecalis, Streptococcus pneumoniae et Pseudomonas aeruginosa, germs that become resistant to certain antibiotics.

Note 12. "Un patient britannique nécessitant un pontage coronarien avait deux options: attendre son tour pendant six mois ou débourser 35.000 U$ afin d'être opéré immédiatement." ("A British patient requiring a coronary bypass had two options: wait for his turn during six months or pay out $35.000 U to be operated at once.") *Tourisme cardiaque, Agence Science-Presse*, 11/02/2005 (http://www.sciencepresse.qc.ca/archives/2005/cap0702057.html);

"la perspective d'une médecine à deux vitesses aurait de fortes chances de se concrétiser", ("The prospect of a two-speed medicine would have strong chances to become a reality") *Suisse: Le tourisme médical est lancé*, 28 April 2006, *Journal du Jura*, http://www.veille.ma/+Suisse-Le-tourisme-medical-est+.html.

Note 13. Portugal deve apostar no turismo médico (Portugal must focus on medical tourism), 30 Oct. 2009, *Jornal de Notícias*, Lisbon (http://www.portugalvivo.com/spip.php?article4593).

Table 1. Selective Destinations of the MT for US Medical Tourists and Possible Savings (%) due to the Care Made Abroad (2007/2008 prices with a 30 % relative dispersion)

Type of surgical interventions	Cost in US (USD)	Savings abroad (%)	Medical Tourism Destinations	Source
Dental treatments	1 000 to 5 000	75	Costa Rica, Mexico, India, Hungary, Tunisia, Thailand	a
Correction of myopia		70	Istanbul (Turkey)	b
Bypass heart Replacement cardiac valve Vertebral fusion	130 000 160 000 62 000	90	India, Thailand, Malaysia	c
		85	Singapore	
Angioplasty	57 000	75 - 80	India, Malaysia, Singapore, Thailand	
Operations of the hip Operations of the knee	43 000 40 000	80	India, Malaysia	
		70	Singapore, Thailand	
Hysterectomy	20 000	85	India, Malaysia	
		75	Singapore, Thailand	
Transplant of marrow	250 000	90	India	d
Prostatectomy	4 600 £ UK	50	Tunisia	e

a: http://tourisme-dentaire-info.com

b: http://www.novacorpus.fr/fr_fr/clinique-ophtalmologique-vision-laser-yeux-operation-lasik-vue-turquie.html?Itemid=251

c: Woodman (2008) and *ABILITY Magazine* (http://www.abilitymagazine.com/pbb.html).

d: Pitti (2009).

e: http://www.telegraph.co.uk/health/6030188/Medical-Treatment-Abroad-Is-it-a-f...

(Medical Treatment Abroad: Is it a false economy? by Tammy Cohen).

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Integrating ERP into the Organization: Organizational Changes and Side-Effects

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Abstract

Faced with increasingly strong and varied forms of competition, firms are seeking more efficient organizational models. At the same time, the widespread application of information and communication technologies (ICT) is transforming the manner in which the information required for coordinating the units within an organization is collected, exchanged, and stored. The question then arises of how the installation of an Enterprise Resource Planning (ERP) program may affect these coordination mechanisms. The subordination of technological change to organizational change appears to underestimate the scope of the transformations that ERP can bring about within an organization. Theoretical and empirical arguments lean towards attributing direct effects to ERP, believing it to possess intrinsic organizational virtues. Because of the difficulty of making an ad hoc inventory of organizations employing ERP software, earlier statistical studies have largely ignored the integration of ERP into the organization.

Keywords: ERP, Organizational change, Coordination, Learning

1. Introduction

To clarify the issues surrounding the integration of ERP and organizational change, a simple, robust analytical framework was constructed, designed to enable the discussion and validation of various basic speculations.

We first present the foundations of the approach we have adopted, and then define the concepts of ERP and organization that we intend to apply. This approach is based on a dynamic relationship between technology and organization formulated in terms of coordination, the organization being by turns that which controls the integration of ERP software, and that which is transformed by it. The next section is devoted to the organizational changes connected to the incorporation of ERP, and then to its effects on the mechanisms for coordination between the organization's units. Lastly, we discuss the nature and role of the resulting learning effects within the organization.

1.1 The Integration of ERP into an Organization

In recent years corporate managements have faced a technological tipping point: integrated management (ERP) software packages are becoming the central component for collecting and applying management information (Grandlund and Malmi, 2002; Kocoglu and Moatty, 2010). In the fifteen years from the emergence of ERP to the widespread use of this tool, the majority of major companies have adopted or attempted to adopt its software. At both the practical and technical levels, this represents a substantial innovation which requires a comprehensive integration of the information process. One of the main benefits of integrating ERP into the organization is the ability to manage large quantities of data within a single, shared system. Over and above this significant technical advance, the installation of an ERP system presents a real opportunity for improving the firm's organization. In this regard the adoption of ERP constitutes a significant incursion into the firm's organizational life, and as such it is viewed as a real agent and actor for organizational change (Hanseth and Braa, 1999; Geffroy-Maronnat, 2010).

When we discuss ERP, the question at issue is whether it is the ERP system that (re)structures the organization, or whether it is the organization that determines the possibility of integrating ERP. In practice, the ERP system and the organizations determine the matter mutually, depending on the degree of advancement of the processes developed by the organization to order its activities.

1.2 ERP and Organizations

The dialectics of the relationships between ERP and organizations are particularly intense, since ERP systems represent technologies that act directly on the mechanisms that coordinate the organizations' components. The relationships between these technologies and the organizations are therefore intimate ones. The organizations' characteristics thus appear as constraints on the introduction of ERP. These characteristics are often determined by the nature of the firm's activity and environment. Organizations are not structured so as to introduce technologies - technologies are introduced to improve the organizations' efficiency.

Once they have been incorporated, ERPs contribute to changing the relative efficiency of organizational mechanisms (Spathis and Constantinides, 2003; Rowe & al., 2011). For example, if it is shown that ERP acts to increase the efficiency of a hierarchical decision-making system, by short-circuiting some of the intermediate levels of data-collection or the transmission of instructions, the potential reduction in hierarchic levels will lead to significant changes in the organization's structure and management.

We will begin by setting out the analytic components required for an investigation of the relationships between ERP systems and organizations.

1.3 Organization and Coordination

The neo-institutional theory (Coase, 1937, Williamson, 1985 and 1995) provides a convenient framework for analyzing the relationships between ERP and organizations, if we look at the organization as a set of coordinating mechanisms mainly intended to process and solve information problems (asymmetries of information, transaction costs arising from the need to collect and process information, etc.) and based on behavioral theories (bounded rationality, opportunism, etc.) which are also grounded in the connection between agents and the processing of information.

If we agree with Mintzberg (1979) in defining coordination as "the glue in the structure, the basic element which holds the parts of the organization together" and consequently see the organization as a set of mechanisms intended to solve the problems of coordination, we may then describe the organization as an assemblage combining two kinds of coordination mechanisms. One kind, related to the decision-making system and the division of labor between units, defines the structural features of the organization: its organizational mechanisms. The other kind clarifies the choices which, within these mechanisms, describe how agents resolve problems of the consistency of actions and of meeting commitments, i.e., the rules.

This instrumental approach is useful in analyzing the organizational determinants of integrating ERP and, conversely, the impact of ERP on an organization. It will be supplemented by a more dynamic concept of the firm, taking into account some of the related effects on the organization over the longer term.

Any organization can be broken down according to two elementary coordination principles: the hierarchization of its units, and their interdependence. The combination of these principles allows us to define various types of organizational architecture. Reflecting their architectures, the information flows generated by the hierarchic principle and by interdependence among units will have different information densities, and must conform to a standardization which will be more or less comprehensive.

Hierarchization is the coordination principle which refers to the manner in which authority is distributed among the various components of the organization. This distribution of authority may be centralized, decentralized, or hybrid. A hybrid form is considered desirable, to allow for the reality on the ground. This hybrid form is located on a continuum, where the traditional forms represent the extremities. When one unit centralizes all the authority, stipulating to the other units the way in which they should behave, the information flows between the various hierarchic levels are large, frequent, and usually follow procedures defined in advance.

Interdependence refers to the way in which the work process is divided up within the company. It is characterized by the amount of autonomy that the units have in carrying out their tasks. The division of labor may be specialized, or alternatively may be based on a high degree of integration of the tasks. In the case of specialization the units are responsible for clearly-defined operations, whose execution assumes frequent, complementary interactions. In contrast, integration amounts to entrusting each unit with the coordination of a variety of tasks. In this case the units are less interdependent. In architectures based on specialization, the interdependencies between units are more significant and more frequent than in architectures based on integration. It follows that the needs for interactions and

thus for exchanges of information are more intensive in organizations whose architectures are based on specialization.

1.4 Nature of the Information Flows

The integration of ERP remains dependent on other variables such as the nature of the activities and the environment. In fact, it will depend on the activities, the more or less voluminous and more or less regular information flows between the units, the more or less easy-to-codify relationships, and so on. All these characteristics influence the relative significance of integrating an ERP system.

ERP systems provide automatic processing, transmission, restitution, and storage of information. The basic problem is that of the relationships between ERP and the coordination mechanisms (Grandlund and Malmi, 2002; Kocoglu and Moatty, 2010). Coordination mechanisms are based on the transmission of information flows between units. We may distinguish two main categories, based on the greater or smaller informational intensity of the coordination mechanisms, and the more or less standardized nature of the procedures for coordinating and processing information.

The informational intensity of a coordination mechanism is measured by the volume, frequency, and regularity of the information flows exchanged between the units. Low-volume exchanges, overly rare occurrences, or irregular relationships between the units do not require the installation - and do not always allow the profitability - of technologies which provide automatic transmission of information flows. As with any technology, ERP involves investments that are subject to criteria of utility and profitability.

The requirement for standardization affects the procedures for exchanging and processing information (Bernier, Bareil, and Rondeau, 2003; El Amrani & al., 2006). Firstly, it may be difficult or even undesirable to formalize the information exchanges which occur in the process of coordination. This is the case for the exchanges known as mutual adjustments, which do not follow procedures defined in advance but take place in the framework of uncodified interactions between units. It is often risky to make them automatic, because the units would lose the flexibility conferred by informal interactions, especially in situations of uncertainty. The use of ERP systems in coordination is thus closely linked to the nature, formal or informal, of the procedures which govern the inter-unit relationships.

Lastly, the information-processing procedures must be sufficiently uniform (Grandlund and Malmi, 2002; Sangster, A., Leech S.A., Grabski, S., 2009). Heterogeneous procedures are almost immediately expressed in high costs for the formalization of information. Information-processing procedures may be heterogeneous for a number of reasons. The lists used to codify the information may differ from one unit to another, similarly for the layouts of documents, the kinds of software, and the equipment employed. The existence of differing procedures for processing information thus constitutes a severe practical obstacle to the automation by ERP systems of the flows of information between organizational components.

The combination of the aspects identified (hierarchy and interdependence) and their various modalities enable the construction of a practical framework for analysis:

Insert Table 1 Here

The combination of two systems of coordination - hierarchization and interdependence - defines five types of organizational architecture. Each of these architectures is in principle characterized by a more or less intensive need for coordination and by whether or not it meets the requirement for standardization. They indicate the potential difficulties of integrating an ERP system and thus the organizational changes that must be implemented.

❶,❷ ERP is primarily employed in centralized architectures, because its information flows are numerous, follow formalized procedures, and are conveyed by homogeneous languages. Moreover when the architecture is specialized, ERP systems also see intensive use in the horizontal coordination between units.

❸,❹ On the other hand, their use runs into difficulties in decentralized architectures, where coordination relies on other tools in which there is a substantial amount of mutual adjustment. In addition, the insignificant information flows in vertical coordination, and the difficulty of meeting the requirement for standardization, are further obstacles to the installation of ERP. When the architecture is decentralized and specialized, there is likely to be a considerable need for horizontal coordination, but since decisions are decentralized the horizontal coordination tends to take place via mutual adjustments carried out as the need arises, which do not lend themselves to automation.

❺ In hybrid architectures, intermediate between the centralized and decentralized forms, the difficulty of integrating an ERP system is intrinsically linked to the nature of the hybrid architecture. These structures, found in almost all organizations (and often run by a manager whose decision-making power is poorly defined and who consequently

has difficulty in making decisions), favor the development of resistance to change and of difficulties in formalizing hitherto non-existent procedures.

To sum up, in organizations whose architectures are centralized and specialized, the integration of an ERP system is easier. Moreover the information-processing procedures tend to be standardized and assigned to a single authority. All the factors thus combine to make it easy to integrate ERP into the coordination of units along the line of authority. In certain cases the constraints of this adaptation will be costly, and may create significant organizational discords.

2. Effect on the Systems of Coordination

Implementing an ERP system to improve coordination between units has consequences for the organization. The analytic framework set out in Table 1 indicates that ERP systems may encourage the adoption of centralized and specialized architectures, since they strengthen relative efficiency. Nevertheless, it remains true that the role played by ERP in the organization's architecture is dictated by much more decisive factors, such as the need to adapt to the conditions of the market. For this reason the impact of ERP on organizations is seen more in their operating systems than in their architectures. We now discuss this type of impact.

2.1 ERP and Operating Systems

If ERP systems have an effect on an organization's operating systems, it is because they alter the relative efficiency of the various kinds of system. In general, the adoption of new systems results from a need created by external pressure, e.g., new standards. ERP can make it easier to adopt them, but it is a consequence, not a cause. It is nevertheless true that ERP can play a major role in the selection of operating systems. Although the general nature of a system of behavior is to represent a knowledge-based and therefore an information-based economy (Favereau, 1989), some systems require more information than others and/or a more complex processing and a shorter reaction time from the units. The more information the system uses, and the more complex and time-limited its processing, the more the use of ERP will improve the relative efficiency of the system (Brousseau and Rallet, 1997).

2.2 Sets of Mechanisms

The limited rationality of agents, and the presence of asymmetries of information, situations of uncertainty, and problems of opportunistic behaviors by agents, makes it necessary to have coordination mechanisms based on operating systems. We will attach to their basic features any real coordination mechanism that is a combination of these features (Brousseau, 1995). We will restrict ourselves to systems likely to be affected by the use of ERP, because ERP is closely linked to information-management processes. More specifically, we will describe all of the operating systems in terms of the two major types of problems that they must address: to ensure the compatibility of the agents' actions, and to force them to meet their commitments (Brousseau, 1996).

Compatibility of actions requires that systems be set up that dictate to the agents the behavior that they must adopt during the coordination process. The mechanisms that ensure this compatibility are of two kinds: rules, and the principle of authority, depending on whether the behaviors are defined ex ante at the time of establishing the contract, or ex post when it is carried out.

Rules consist of defining ex ante all of the possible behaviors, in a contingent fashion according to the various world states envisaged. Authority systems (Williamson, 1985, Ménard, 1990) describe the agency which, designated as the authority, will define ex post the behaviors which the agents must follow (delegation of authority). In a situation of uncertainty and over relatively long periods, none of the alternatives is optimal, and any organization will appear as a mix of rules and authority systems. The issue is to know whether ERP systems can alter the proportions of these mechanisms. The meeting of commitments made by the agents in order to comply with the rules or with the decisions of the authority requires the establishment of special mechanisms. Without these mechanisms the agents would tend not to meet the obligations they make, which would at once remove all efficiency (individualism). A traditional response is represented by reprisal mechanisms and incentive mechanisms. Reprisal mechanisms are based on the idea that if the costs of breaking a commitment are high, agents will tend to meet them, because in that case opportunistic behaviors turn out not to be beneficial (Williamson, 1985). Mechanisms which consist of encouraging agents to meet commitments by playing on their remuneration represent an alternative to reprisals. This is the aim of incentive mechanisms, which are based on the payment of bonuses (or on penalties) according to observed deviations from the norm of commitment. No solution is optimal: reprisals require a simple monitoring mechanism but the contract termination that may result from imposing them might prove to be costly for the parties involved. On the other hand, incentive arrangements involve the establishment of costly monitoring systems to accurately determine agents' behaviors and their contributions to the collective result.

Organizations usually combine incentives and reprisals according to the cost/benefit ratio of the monitoring associated with each mechanism; we wish to know whether ERP systems favor one of these types of mechanism.

2.3 ERP, Authority, and Incentives

ERP systems affect the relative efficiency of methods inasmuch as they alter their costs, sometimes in a major way. Because of their more information-intensive nature, authority and incentives represent approaches whose efficiency should, in principle, be improved by ERP systems. Since they correspond to expected behaviors, rules require little in terms of the exchange and processing of information when making decisions. Agents interpret the situation in which they find themselves and select the rule provided.

In contrast, in the case of a decision procedure based on authority - the type of decision adopted in situations of high uncertainty because it allows for greater flexibility – the authority-based decision involves the intensive management of information, The unit responsible for the decision must quickly assemble, select, and process many pieces of information and then rapidly transmit its decision. By facilitating the selection of information, by increasing the agents' computing power, and by accelerating the transmission of decisions, ERP systems lower the cost and improve the efficiency of making decisions based on authority as compared with rules. Such an impact is even more likely when uncertainty is high and demands more flexible decision-making systems.

As we noted, incentive mechanisms involve an intensive manipulation of information arising from the checks that have to be performed in order to calculate them. The effect of ERP systems is thus more conspicuous for incentive mechanisms than for reprisal mechanisms. The efficiency of reprisals is linked to their deterrent effect, designed to avoid serious derelictions whose consequences are by their nature easily observable. By lowering the costs of handling information, ERP systems are likely to alter the balance between methods whose purpose is to ensure that commitments are met. They therefore favor the incentive method. The instability of the environment in which organizations operate reinforces this tendency, because the ability to adapt which it demands of its agents depends in part on the possibility of managing their actions by means of an incentive system that is both discriminating and constantly updated (Batazzi and Alexis, 2006). The organizational impact of ERP systems is likely to be expressed by a tendency to favor the authority method for making actions compatible, and the incentive method for ensuring that commitments are met. This division will be even sharper when the organization's environment is unstable, or perceived as such by its executives.

2.4 Learning Effects and the Organization's Trajectory

The learning effects which underlie technological trajectories enable modifications and changes in the company's strategy. Ultimately, the initial conditions for incorporating ERP systems, the impact of contingent events, the inherent inertia of organizational phenomena, and learning effects offer a great variety of possible organizational trajectories.

The integration and use of ERP systems is the source of three kinds of learning, which progressively alter the organization of activities:

- In the first place, the introduction of ERPs necessitates a systematic study of the information flows which underpin the coordination mechanisms. Organizations are thereby led to model their actual operating procedures. The integration of ERP then becomes the occasion for the organization to develop a more detailed knowledge of its own functioning. The members of the organization are forced to (re)examine existing organizational solutions and to identify the inconsistencies and redundancies which characterize their information circuits. This initiates a discussion of the organization and implementation of necessary changes. The organizational changes then carried out constitute a form of organizational learning, for which ERP serves as both pretext and support (Besson and Rowe, 2001; Kocoglu and Moatty 2010).

- The second learning mechanism results from the broadening of the field of operations of information processing and of automated coordination procedures. ERP systems generate a stock of information whose use, whether local or in a network, creates tensions (access to information, validation and decision-making power, new connections between units, for example). The resolution of these tensions leads to organizational changes. The identification of local dysfunctions by applying tools for analyzing and assessing performance leads to reorganizations. The organization will evolve more or less quickly, depending on the way in which the integration of ERP is orchestrated (El Amrani, Rowe, Bidan, Geffroy, and Marciniak, 2006).

- The third mechanism is the learning of technologies by their users (Von Hippel, 1988). It constitutes another learning effect which creates organizational change. Users do not understand all of ERP's potentialities ex ante: they learn by doing. Learning does not only address the improvement and optimization of procedures, but also the mechanisms of coordination. This learning varies according to the ownership of usages by the users and according

to the difficulty of changing the existing coordination mechanisms. Organizations which begin by implementing ERP systems to improve the efficiency of existing coordination processes progressively discover the most suitable forms of organization for using the technologies which they are simultaneously learning to apply.

The interactions of the determinants of change which we have discussed constitute a basis for examining future organizational trajectories. Other variables need to be included in the analysis in order to make it more dynamic: barriers to exit, resistance to change, and the occurrence of contingent events.

The barriers to exit seen in the area of technical change (David, 1986; Cowan, 1990; Foray, 1991) also exist in the area of organizational change. The technical solutions adopted to resolve organizational problems involve both the physical systems, and the procedural formalizations which act to strengthen the coordination mechanisms to which these solutions are applied. They therefore commit the organizations to specific development trajectories. Assuming that ERP systems allow the promotion of incentive systems, it will be more difficult to go back to reprisals, even if the seeming efficiency of these systems leads the organization to develop a costly system of monitoring. The fact that incentives are favored will argue in favor of integrating ERP systems, which support this type of coordination. The dependence of technical/organizational change on past choices is a prime factor in explaining the variety of trajectories followed: similar external conditions (type of activity, of market, etc.) will not lead to a convergence of technical/organizational choices among different entities if their previous choices have put them onto different trajectories.

Resistance to organizational change constitutes another source of variety in development trajectories (Scapens and Jazayeri, 2003; Greenan, N., and Walkowiak, E., 2010). The organizational changes caused by ERP systems may give rise to conflicts, inasmuch as they lead to changes in the division of labor and/or needs for different skills. Such conflicts may delay or prevent change, or restrict such change to the original organization. Resistance to change may also be explained by the difficulty of predicting its long-term consequences. Mistrusting radical reorganizations, agents display a preference for localized changes or for deferred change. Such resistance, which offers substantial inertia, tends to perpetuate existing organizations, or at least forces them to develop slowly. In addition, the actors sometimes tend to use resistance to change, unconsciously at times, as an implicit tool in salary negotiations.

Once it has been completed, the integration of ERP commits the organization to a trajectory which limits its future technological options (adaptation costs, successive versions of the ERP system, exit costs) and consolidates the initial choice via learning effects. Because of this, contingent events are especially influential at the start of the trajectory, as long as a few degrees of freedom remain for making procedural choices and, if need be, to direct the learning process. There is a risk for the organization of becoming locked into a technological trajectory, assimilating contingent events as they appear until a point is reached where it is no longer possible to react to sudden changes in the environment, owing to the accumulated inertia. Such a rigid technological trajectory may sometimes expose the firm to exit and mobility costs that are unsupportable.

3. Conclusion

In this paper we have attempted to construct an analytical framework for the process of integrating ERP into organizations, based on a small number of variables which express the principal features of organizations (organizational architectures and methods of coordination). The issue selected arises from an organizational determinism tempered by a consideration of the organizational impact of an ERP system, and of learning effects. The initial conditions of ERP's integration (the various types of organizational architecture) play a determining role because they define its use and delimit the scope of its organizational impact. This impact acts mainly on the methods for ensuring the compatibility of actions and ensuring that commitments, once made, are met. ERP forces organizations to favor information-intensive coordination methods such as authority and incentives, inasmuch as changes in their environment push them in the same direction. Learning effects relay these changes over time via the knowledge which the organizations acquire about themselves and about the potential of ERP. What matters is that the technology-organization pairing should work coherently together. The development of both aspects can be achieved only through technological and organizational learning. The analytical framework proposed here cannot provide answers to all the questions raised by the organizational trajectories when looked at from a dynamic viewpoint. The choice of an ERP system actually tends to support previous choices, given that the results of radical changes are risky and unpredictable. Situations in which organizations are forced to change their operating models are situations of open crisis, where the organization's survival is threatened and it has no other choice.

References

Aoki, M. (1990). Toward an Economic Model of the Japonese Firm. *Journal of Economic Literature*, 28, 1-27.

Batazzi, C., & Alexis, H. (2006). Une approche des TIC dans l'organisation par la notion de confiance. *In Actes du Colloque Pratiques et usages organisationnels des sciences et technologies de l'information et de la communication*, Cersic Erellif, Rennes.

Bernier, C., Bareil, C., & Rondeau, A. (2003). Transformer l'organisation par la mise en œuvre d'un ERP. *Gestion*, *27*(4), 24-33. http://dx.doi.org/10.3917/riges.274.0024

Besson, P., & Rowe, F. (2001). ERP project dynamics and enacted dialogue: perceived understanding, perceived leeway, and the nature of task-related conflicts. *Database for Advances in Information Systems*, *32*(4), 47-66.

Brousseau, E. (1995). Contracts as Modular Mechanisms: Some Propositions for the Study of Hybrid Forms. *International Journal of the Economic Business, 2*(3), 409-439. http://dx.doi.org/10.1080/758538014

Brousseau, E. (1996). Technologies de l'information et de la communication, gains de productivité et transformations des dispositifs de coordination. In M.C. Monnoyer (Eds), *L'entreprise et l'outil informationnel*, Paris: L'Harmattan.

Brousseau, E., & Rallet, A. (1993). Développement des systèmes télématiques et évolution des relations interentreprises dans la construction. *Rapport de recherches au Plan Contruction et au PIRTTEM*, pp. 105.

Brousseau, E., & Rallet, A. (1997). Le rôle des technologies de l'information et de la communication dans le changement organisationnel. In: Guilhon, B., et al. (Eds.), *Économie de la connaissance et des organisations.* L'Harmattan, pp. 286–309.

Coase, R. H. (1937). The nature of the firm. *Economica*, 386-405. http://dx.doi.org/10.1111/j.1468-0335.1937.tb00002.x

Cowan, R. (1990). Nuclear power reactors: a study in technological lock-in. *The Journal of Economic History*, *50*(3), 541-567. http://dx.doi.org/10.1017/S0022050700037153

David, P. (1986). Understanding the Economics of QWERTY: the Necessity of History. In Parker (ed.), *Economic History of the Modern Economist*, Basil Blackwell.

El Amrani, R., Rowe, F., Bidan, M., Geffroy, B., & Marciniak, M. (2006). Effets de la stratégie de deploiement des PGI sur la vision transversale de l'entreprise. *Revue française de gestion*, 32(168/169), 267-285.

Favereau, O. (1989). Marchés internes, marchés externes. *Revue Economique*, 40(2), 273-328. http://dx.doi.org/10.2307/3502116

Foray, D. (1991). Dynamique économique et nouvelles exigences de l'investigation historique: learning to love multiple equilibria. *Revue Economique*, 2, 301-314. http://dx.doi.org/10.3406/reco.1991.409279

Geffroy-Maronnat, B. (2010). ERP et dynamique sociale de l'intégration, *Management & Avenir* 9(39), 233-249.

Gollac, M., Mangematin, V., Moatty, F., & et de Saint-Laurent, A. F. (1995). *A quoi sert l'informatique? Revue d'études de cas.* Miméo CEE/INRA.

Grandlund, M, & Malmi, T. (2002). Moderate impact of ERPs on management accounting: a lag or permanent outcome? *Management Accounting Research,* 13(3), 299-321. http://dx.doi.org/10.1108/02635570310506098

Greenan, N., & Walkowiak, E. (2010). La dynamique des changements à long, *Réseaux*, 4 (162), 231-273.

Hanseth, O., & Braa, K., (1999). SAP as Emergent Infrastructure in a Global Organization. *Systèmes d'Information et Management*, 4(4). 53-70.

Kocoglu, Y., & Moatty, F. (2010). Diffusion et combinaison des TIC, *Réseaux*, 4 (162), 33-71. 33

Mintzberg, H. (1979). *Structure et dynamique des organisations*. Paris/ Montréal: Éd. d'Organisation/Éd. Agence d'Arc.

Rowe, F., Marciniak, R., & Clergeau, C. (2011). The contribution of information technology to call center productivity: An organizational design analysis. *Information Technology & People*, 24(4), 336-361. http://dx.doi.org/10.1108/09593841111182278

Sangster, A., Leech, S. A., & Grabski, S. (2009). ERP implementations and their impact upon management accountants. *Journal of Information Systems and Technology Management,* 6(2), 125-142.

Spathis, C., & Constantinides, S. (2003). The usefulness of ERP systems for effective management. *Industrial Management and Data Systems,* 103(8/9), 677-685. http://dx.doi.org/10.1108/02635570310506098

Scapens, R., & Jazayeri, M. (2003). ERP systems and management accounting change: opportunities or impacts? *European Accounting Review,* 12(1), 201-233. http://dx.doi.org/10.1080/0963818031000087907

Von Hippel, E. (1988). *The sources of innovation*, New York, Oxford: Oxford University Press, pp. 218.

Williamson, O. E. (1985). The Economic Institutions of Capitalism. *Firms, Markets, Relational Contracting*. New York: The Free Press.

Williamson, O. E. (1995). Hierarchies, Markets and Power in the Economy: An Economic Perspective. *Industrial and Corporate Change*, 4(1), 21-49. http://dx.doi.org/10.1093/icc/4.1.21

Table 1. Integration of ERP Software in Organizations (Based on Rallet and Brousseau, 1997)

<table>
<tr><td colspan="2" rowspan="2"></td><td colspan="3">Hierarchization (vertical coordination)</td></tr>
<tr><td>centralized</td><td>hybrid</td><td>decentralized</td></tr>
<tr><td rowspan="2">Interdependence (horizontal coordination)</td><td>Specialized</td><td>❶ Strong vertical and horizontal coordination. High informational intensity</td><td rowspan="2">❺Imperfect horizontal and vertical coordination Mutual adjustments. Poorly-defined decision-making power.</td><td>❸ Weak vertical and significant horizontal coordination. Informational intensity and mutual adjustments.</td></tr>
<tr><td>Integrated</td><td>❷ Strong vertical and weak horizontal coordination</td><td>❹ Little need for coordination.</td></tr>
</table>

An Integration Model of the Impact of IT Investment Announcements on Firm Market Value

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Abstract

Large amounts of resources have been, and will continue to be, invested in information technology (IT).The current paper establishes an integrative model of the impact of IT investment announcements on firm market valueby reviewing and analyzing several papers of empirical research. The impact factors are divided into four parts:IT investment characteristics, firm characteristics, competitive environment (including industry characteristics and partner characteristics), and country characteristics. In addition, the current article applies the integrative model to guide future research by proposingcorresponding hypotheses. The objective of the paper is to help scholars further understand the status and limitations of relative studies to facilitate further research. The proposed hypotheses providefirms with scenarios that can get the most benefit out of IT investment, thus guiding scholars on empirical research as well as strategic decision makers in organizations.

Key words: IT investment announcements, IT investment value, Firm market value, Impact factors

1. Introduction

Thus far, substantial resources have been invested in information technology (IT) (Teo, Wong, &Chia, 2000). However, IT impact on firms is still inconclusive.Many studies have attempted to establish the relationship between IT investment and enterprise performance (Aral& Weill, 2007); however, the conclusions obtained from empirical studiesare inconsistent. Some results indicate a positive correlation between IT investment and firmperformance (Brynjolfsson&Hitt, 1996, Harris & Katz, 1991), but other studies have found no significant relationship between the two (Berndt & Morrison, 1994, Loveman, 1994). Recent researches indicate that when IT investment with specific attention enters at the proper opportunity, and acquires better management and proper mutually complementary investment, more business values will be produced (Barua&Mukhopadhyay, 2000). Many research methods can be used for relevant research; the event study method (Richardson &Zmud, 2002) is one of them. Event study method has been widely used in the accounting and financial fields to calculate the impact of a specific event on an enterprise market value (Ball & Brown, 1968, Brown & Warner, 1985). In the information system (IS) research field, an event refers to IT investment announcements (Richardson &Zmud, 2002). These IT payoff studies

focus on two problems: (1) Does IT payoff?and(2)In which conditions can IT investment obtain the maximum return (Richardson &Zmud, 2002, Dehning, Richardson, &Zmud, 2003, Oh, Kim, & Richardson, 2006)? In literature, firm market valueis used as the measure ofan IT investment payoff. For the first research problem, the conclusions obtained from previous studies areinconsistent. The second research problem tried to explain the source of the inconsistent impact of IT investment and to determine when an IT investment is efficient.

For the two issues mentioned above, the current article has three targets: (1) review the literature for empirical studiesand summarize the limitations of previous research on the impact factors of IT investment values, (2) propose an integration model of the impact of IT investment announcements on firm market value based on relevant theory and existing studies on the impact of IT investments on firmmarket value, and (3) propose relevant hypotheses to guide future research.

In collecting literature, the authors used "Information Technology" or "Information Systems," "e-commerce" or "e-business," and "announcement" as keywordsto search in all ISI Web databases. The authorsobtained 24 related articles from a total of 206 articles by finding and reading the papers one by one. The citation databases of SCI-Expanded and SSCI in the ISI Web of Knowledge started their collection from 1994 to 1998.For the literature before1998, the authors mainly filteredthese using the references of existing literature. The authorsobtained 25 related literaturesfrom the period 1993–2007.

First, the article systematicallyreviewsempirical studiesin the literature to look into the factors of theseempirical studies andthen summarize their limitations. Second, an integration model is proposed based on the related theory and existing empirical studies. This article also proposesrelevant hypotheses to guidefuture research based on the integration model. Finally, the contribution and limitations of this articleare presented.

2. Review of Empirical Research

2.1 Literature Review

The author divided the literature into six categories based on the research objects to more clearly understand and compare the literature before reviewing the empirical studies. The articleconducts the following statistics based on the research objects and published journals (Table 1).

The first category is investment announcements related to IT. Researchers get the announcements by using information technology (IT) and information system (IS) as the keywords to search. However, the research conclusions are not consistent in these announcements. Dos Santos, Peffers, &Mauer(1993)Im, Dow, & Grover(2001)and Richardson and Zmud (2002)find no significant relationship between IT investment and firm market value.Chatterjee,Pacini, &Sambamurthy(2002),Dehning,Richardson, &Zmud (2003),Dardan, Stylianou, & Kumar (2006), Oh, Kim, & Richardson(2006),and Meng and Lee (2007)indicatethat IT investment can bring excess profits for the firm. In addition, some of the literaturealso studythe impact of IT investment characteristics, firm characteristics, and industry characteristics on the changes in firm market value.Dos Santos et al.find that the market has a higher evaluation for innovative IT investment compared to the following IT investment (Dos Santos et al, 1993). Imet al. (2001) examine the impact of industry, firm size, and announcement time on stockprices. Richardson and Zmud (2002) find the strategic role of IT investment announcements has a significant effect on abnormal returns. Dehning et al.(2003) findthat when companies have strategic transformation in the role of IT investments, they can often get significant excess returns. Oh et al.(2006)find that business growth opportunities, uncertainty, the strategic role of IT, the disclosing party, the interactionrelationship betweenuncertainty and strategic role of IT investments, and that between uncertainty and asset specificity have a significant impact on the abnormal return offirms. Meng and Lee (2007) examine the industry, firm size, and business type, and find that these three factors may affect the value of IT investment.

The second category is e-business announcements. This category of announcements is about firms developing e-commerce activities or expressing the intention to develop e-commerce activities.Subramani and Walden (2001), Lee, Cho, & Lee (2002), Dehning,Richardson, &Urbaczewski(2004), Ferguson, Finnb, & Hall (2005) and Lin, Jang, & Chen(2007)show that e-commerce announcementshave a positive effect on firm market value. Dewan and Ren (2007) find that when the changes in risk are controlled, the impact of e-commerce announcements on the stock price is not significant. The literatureconducts research onthe impact of the type of e-commerce, innovation, firm size, market size, and other attributes of corporate experience on firm market value.

The third category is enterprise system announcements. These announcements refer to enterprise resource planning (ERP) systems, customer relationship management (CRM) systems, supply chain management (SCM) systems, and decision support systems. Hayes, Hunton, & Reck(2001)studythe market reaction to ERP systems and find that investors give a positive evaluation on ERP implementation announcements. They also conducted a research on the

market reaction to theinteraction of firms' health degree and firm size.Aside from the ERP characteristics, theyalso introduce supplier factors. The research results indicate that a smallhealthy firm will gain higher returns, and choosing well-knownsuppliers enhances the firm's benefits. Ranganathan and Brown (2006) employ 116 ERP investment announcements during the period of 1997–2001.They find significantly positive abnormal returns in the events window. They also use regression models to examine the number of ERP module implements, the implementation of the range, and the impact of the supplier on abnormal returns. The regression modelsindicatethat the first two variables are positively correlated with abnormal return.

The fourth category isannouncements related to knowledge management. This type contains the announcements about knowledge sharing and knowledge management system. Sabherwaland Sabherwal (2005) conduct a research on knowledge management announcements based on IT. They find thatthe abnormal returns of firms have a significant relationship withfirm size, Return on sales (ROS), synergy of firm effectiveness and knowledge management, firm stability, and diversification. Based on103 knowledge management announcements from 1995 to 2002, Sabherwal and Sabherwal (2007) find that firmsize, knowledge management strategy, and synergy of knowledge management strategy have a significant relationship withabnormal returns, whereas there is no significant correlation with the knowledge management process, source, andusers.

The fifth category is IT outsourcing announcements. This category mainly refers to outsourcing activities about IT, IS, and e-commerce. The researchers explain the advantages and disadvantages of outsourcing on firmsby learning the impact of IT outsourcing announcementson firm market value. Hayes, Hunton, &Reck (2000) and Peak, Windsor, & Conover (2002)indicate thatIT outsourcing cannot bring excess profits. However, Oh and Gallivan (2004), Oh, Gallivan, & Kim (2006), and Agrawal, Kishore, &Rao (2006) point out that there is a significant relationship between IT outsourcing andfirm market value. These studies also find that industry, scale of outsourcing contracts, specificity of IT resources, difficulty of supervision, firm size, and supplier size have significant impacts on abnormal return.

The sixth category is IT staff announcements. This typecontains announcements about IT workers, management staff, CIO, and so on. Existing studies only focus on the level of CIO appointments because information is limited to CIO appointments. Chatterjee, Richardson, & Zmud (2007) examine themarket reaction to the announcements thatfirmshave created CIO positions. The creation of CIO positions significantly enhancesthe market returnof firms. Khallaf and Skantz (2007) employ 461 CIO appointment announcements from 1987 to 2002, and find no significant difference between created and appointed CIO and appointed CIO alone. They also find thatthe market will punish firmsthatdo not access the advantage of the CIO potential strategy in a timely manner. The market reaction to the quality of CIO appointmentsis also examined.

2.2 Limitations of Existing Research

Althoughexisting studies have examined the impact of IT investments on firm market value from various dimensions, there are some limitations. First, the time interval of the sample used in literature is too short, thus further validation of these research results is necessary to determine whether they could be applied in present IT investments. Second, certain limitations still exist in the following aspects in existing research.

Most studies belong to the general research on IT investments or e-business investments, and few studies on concrete IT investment projects are available. When the concrete projects are not limited, their special attribute is difficult to concretize to measure their influences on IT investment values. Therefore, various IT investment projects should be concretized, and the character factors and weights influencing the enterprise market value should be tested, aiming at various concrete investment projects (Dos Santos et al., 1993, Im et al., 2001, Hayes et al., 2001). For example, ERP systems provide a unified information platform that improves the internal efficiency offirms, saves costs, and providesopportunities for future application.CRM systems achieve a better understanding of customer preferences to gain higher customer satisfaction and,ultimately, improve business performance. The strategic goals, scale of implementation, time needed to implement, technology during the implementation, and process of producing value between the two systems are different. The impact of theinfluencing factorson IT producing business value is also not the same. Thus,the specific characteristics of ERP and CRM should be discussed. Based on a certain theory, the attributes that may affect the business value will be found.

In the aspect of firm characteristics, firm attributes play a vital role during IT investment producing value, although empirical studies employingfirm characteristics are available. The kind of firm characteristics that has great impact on IT investments is difficult to identifybecause IT investments are broad. Thus, for specific IT investments, the kind of firm characteristics that will systematically influence IT investment value can be analyzed based on theory and previous studies (Dos Santos et al., 1993, Hayes et al., 2000). For instance, the purchase of IT hardware has little connection with the health degree offirms. However, the implementation of large enterprise systems such as

ERP may greatly exceed the budget because of some uncontrolled factors. This situation may lead to a capital chain break if the health degree of firms is too low. Eventually the project will fail. Other studies also point out that IT authority, IT management ability, IT experience, and investments of complementary resources could influence IT investment value. For example, the innovative IT investment of Wal-mart and K-mart may have a different impact on market value (Oh et al., 2006).

All firmactivities carried out in a certain external environment. Thus, the influence of the external environment should be considered. In previous studies, the industry is always taken as the control variable; however, it is coarsely classified, and few researchers study how the industrial character adjusts with the IT investment value. First, firms in highlycompetitive industries which adopt IT investment aiming to save costs cannot achieve a sustainable competitive advantage. The burden for this part is often taken by the consumers for the sake of competition. Therefore, it is necessary to define the industry more precisely in order to study what kind of IT investment can bring more effective returns (Dos Santos et al., 1993, Im et al., 2001). Second, with the increasing relationship between firms, partners play an important role in the process of IS implementation. However, little research is available in this area. Only some paperson ERP and IT outsourcing consider suppliers as a factor which adjusts abnormal return. Apart from the two factors above, the country's culture, infrastructure, and other features are likely to impact IT investment value. However, there is only one article of research on this aspect (Meng and Lee, 2007). The article compares the difference of IT investment value between China and the United States, and choosesonly one country as a representative. The general conclusions are questionable.

From the discussion, the studieson the aspect of IT investment characteristics, firmcharacteristics, and external environment are shown to be insufficient. Studies that simultaneously consider all aspects are almost nonexistent. Thus, there are two research directions for future studies. One is further study that focuses on IT investment characteristics, firm characteristics, or external environment. The impact of an IT investment from one dimension can be measured based on the controlling variables in the other two dimensions. Another direction is to simultaneously consider the impact of IT investment characteristics, firm characteristics, andexternal environment, although the interaction between the three aspects cannot be neglected (Oh et al., 2006).

Thus, the current article proposes an integration model of the impact of IT investment announcements on firm market value based on the summary of existing literature and limitation analysis.

3. Integration Model

The different IT investment announcements will have different impactson firm market value according to the discussion above. In addition, the unique characteristics of an individual firm can influence the IT producing value. As mentioned above, the external environment also plays an important role in determining the business value produced by IT. Thus, the external environment is divided into competitive environment and country characteristics. The competitive environment contains industry characteristics andpartner characteristics. Based on the related theory and empirical studies, the current article proposesan integrated modelthat explains the impact of IT investment characteristics,firm characteristics, industry characteristics, partner characteristics, and country characteristics on firm market value (Figure 1).The impacts of these five characteristics onfirm market value will be discussed later.

3.1 IT Investment Characteristics

The differences in IT investment characteristics may bring different reactions (Oh et al., 2006). The factthatsome IT projects will not succeed is indisputable (Lucas, 1999). Most IT project actually have various risks, such as financial risk, technical risk, political risk (Clemons, Thatcher, & Ro, 1995), and agent risk (Gurbaxani and Whang, 1991). These risks may cause the IT project to fail, and the risk of project failure will reduce the comprehensive evaluation of the IT projects. Existing empirical studies classify IT investment from multiple dimensions. Based on the literature theory and empirical study, IT investment is divided aspresented below.This article also proposes some hypotheses.

The first dimension is based onthe first-mover theory andprevious studies (Mascarenhas, 1992). In this caseIT investment is divided into innovative and non-innovative investments. An innovative investment will be defined as the investment represented the first use of a technology among firms competing in that industry, or the investment would result in a new product or service based on information technology, or the investment would result in the development of new information technology for the industry (Dos Santos et al., 1993). In economics, one of the ways firmscan obtain higher income is to seize an opportunity earlier than other firms (Schumpeter, 1950). This means that the adoption of the new IT application will gain economic rents. Therefore,the innovative IT investments will bring higher returnsforinvestors.Technology leaders can gain first-mover advantage, such as the reputation of technical leadership and favorable market position, better access to scarce resources, and strengths in the learning

curve, which can give firms a competitive advantage (Porter, 1985). The researchers find that only innovative IT investments can produce a competitive advantage in the case study (Keen, 1988, Porter and Millar, 1985).Dos Santos et al.(1993)also find that only innovative IT investment can increase firm value. Dehning et al.(2003) also find that the strategic role of IT investment in implementationsthat are ahead of the competitorswill get higher return. Thus, innovative IT investment can increase firm market value.

Hypothesis 1a: Innovative IT investment announcements will increase firm market value more.

The second dimension is based on the resource-based view (RBV). According to the concept of Schein and Zuboff (Zuboff, 1988, Schein, 1992), IT investment strategic role can be divided into four categories: automate, informate-up, informate-down, and transformation. Automate is defined as replacing human labor in automating business processes. Informate-up is defined as providing information about business activities to senior management; Informate-down is defined as providing information about business activities to employees across the firm. Transform is defined as fundamentally redefining business and industry processes and relationships.According to RBV, resources which can generatea sustainable competitive advantage must have four properties: value, rare, inimitable, and non-substitutable (Melville, Kraemer, &Gurbaxani, 2004). These resource attributes build the level of competitive advantage. If the resources are valuable and scarce, firmsthat own the resources can obtain benefits. The resources then provide firms short-term competitive advantage. If the resources areinimitable and non-substitutable, firms can keep competitorsfrom imitating and copying the resources. This advantage is then sustainable (Wade and Hulland, 2004). An automate IT investment is easy to imitate; thus, a competitive advantage is difficult to maintain.When the IT investment occupies the main part in the industry, investors will tend to regard it as eligible elements of competition. Thus, automate IT investment often cannot bring substantial increase in income or value. Information-up and information-down IT investmentshave the potential to improve competitive advantage, but these are easy to imitate and can only, therefore, improve business performance in the short-term. IT investments that play the role of IT strategic transformation to redefine business processes and relationshipsare are difficult to imitate. Thus, they can maintain and sustain competitive advantages. Richardson and Zmud (2002)findthatthe abnormal return of firms is positively related to the strategicrole of IT investment. The results of Dehninget al. (2004) and Ohet al.(2006) support this conclusion. Therefore, transformation IT investment can bring greater value for investors.

Hypothesis 1b: Transformation IT investment announcements will lead to higher excess return.

The thirddimension isasset specificity based on the transaction cost theory. This dimension classifies IT investment according tothe investment's asset specificity. An asset is considered to have asset specificity if it is not easily used in another situation. Asset specificity is one of the important dimensions of IT assets. The transaction cost theory points outthat transactionswith high asset specificities will lead to very strong dependence, which can produce high transaction costs. High specific IT assets will bring trading difficulties and agent risks, which will eventually lead to project failure. They also bring additional cost of supervision. Oh et al. (2006)also find thatasset specificity of outsourcing have a negative relationship with investor response. In summary, investors show a negative attitude on IT investment withstrong asset specificity.

Hypothesis 1c:IT investment announcements with high asset specificity have a negative correlation with firm market value.

The fourthdimension is based on competition agility, organizational integration, and the option value theory. This dimension distinguishes IT investment from the breadth and depth of implementation. The breadth refers to the number of sites that project envelops, defined here in terms of business divisions and geographies. The depth refers to the types of IT modules a firm chooses to purchase. The greater the breadth and depth of the platform IT provides, the more connectivity there will be. These electronic connections can provide a platform where we can share ideas, collect rare resources, and facilitate business processes (Chatterjee et al., 2002). Through collaboration and knowledge sharing, companies can establish and maintain their competitive responsiveness, diversity, and innovation competition. From the organizational integration perspective, the firmthat tries to integrate business processes and data often implements IT in multiple business units or areas. Thus, this firm can get more profit from organizational integration compared with other firms which implement IT in a single department or location. In addition, an IT investment of greater breadth and depth hasmore option gains. The investment in building IT platforms through the integration of functional units, branch offices, activities, and information flow of external partners expands the scope oforganizations (Sambamurthy and Bharadwaj, 2003). Chatterjeeet al.(2002)find that IT infrastructure investments can provide a higher abnormal return compared with IT application investment. Ranganathan and Brown (2006) find that the number of functional modelsfor ERP implementation has a positive correlation withfirm market value. They also indicatethat ERP implementation in a larger scale can bring significant

abnormal returns, whereas a smaller scale cannot produce abnormal return.Based on these theories and the conclusion of the empirical study, the depth and breadth of IT investment has a positive impact on the valuethat the IT investment brings.

Hypothesis 1d: The breadth and depth of IT investment has a positive correlation with the abnormal return which IT investment announcements bring.

3.2 Firm Characteristics

IT investment payoff of firms shows greater difference (Aral and Weill, 2007). Statistical conclusions show that most IT investment payoffscan be explained by firm characteristics (Brynjolfsson and Hitt, 1995). These studies conclude that differences in the quality or nature of firms may also cause differences between IT investment values. Research in the field of accounting and finance has already treated it as one of the important factors (Fama and French, 1992). Some researchers introduce firm characteristics as an independent variable to study its effect on the value of IT investments based on research in other fields combined with the properties of IT investments. Based on existing research and relevant theory, firm characteristics are divided as presented below, and the corresponding hypotheses are proposed.

The first dimensionis based on the information transmission theory, which classifiesfirms according to its scale. Based onthis theory and previous research in other fields, the financial information of small firms is more valuable than those of large firms because of the asymmetry of information. Large firms are the focus of media and analysts. Thus, more information related to large firmsis available even before the release of financial information. However, small firms have less public information. Therefore, the market will have a more obviousresponse toinformation that a small firm releases. Some studies point outthat small firms can get opportunities from IT investments, and this opportunity can maintain long-term competitiveness (Hayes et al., 2000). Hayes et al.(2000)also find that the market has a significant positive response to IT outsourcing announcements from small firms, but has no response tothose of large firms. Im et al. (2001) and Richardson and Zmud (2002)reach a similar conclusion.

Hypothesis 2a: Firm scale has a negative correlation with the abnormal return which IT investment announcements bring.

The second dimension is based on the growth opportunity offirms. A number of financial and accounting research show that a firm's growth rate will affect the reaction to announcements. Firm market value depends on the growth of existing assets and future space. Thus, the growth opportunity of firms is the key determinant of the market reaction(Chatterjee et al., 2002, Fama and French, 1992, Dewan and Min, 1998). A high growth rate means that investors believe the company has great growth potential. In contrast,a low growth rate means that investors are not hopeful about the firm's growth. High-growth companies tend to reinvest their income in positive NPV projects. The market considers high-growth firms to have a better ability to manage investments (Smith and Watts, 1992). Although the empirical conclusions are not inconsistent, Chatterjeeet al. (2002)point out that the growth rate of firms has a negative correlation with the abnormal return[0]. However, Oh et al. (2006) find that the growth rate of firms has a positive correlation with the abnormal return. Based on the above discussion, the growth rate of corporations is believed to have a positive correlation with the impacts of IT investment announcements.

Hypothesis 2b: Firm growth rate has a positive correlation with the impact of the firm market value from IT investment announcements.

The third dimension is based onfirm risk. Firm risk can be measured as the variance of stock return, ROE, ROA et al. IT investment plays a crucial role in reducing firm uncertainty from the perspective of information processing. IT can help firms respond more proactively and in a timely manner to external and internal risks (Galbraith, 1977, Gurbaxani and Whang, 1991). From the information transmission perspective, firm uncertainty is actuallythe investors' lack of confidence in the firm. IT investment announcements send signals to investors of the willingness of managers to increase profitability and generate cash flow. Oh et al. (2002) point out that the response to IT investment announcements has a positive correlation with firm uncertainty. Thus, IT investment announcements by high-risk firms will bring greater benefits.

Hypothesis 2c: IT investment announcementsby high-risk firms will bring greater benefits.

The fourth dimension is based on thetop management's commitment to IT investments. Generally speaking, the senior leadershipthat is able to promote, support, and guide IT investment can improvethe IT investment value (Ross, Beath, & Goodhue, 1996, Armstrong and Sambamurthy, 1999). Neo(1988)indicatesthat the use of strategic ITsupported by top management will give firms a competitive advantage.The impact of IT investments on firm performance or competitive position can weaken when supportis lacking, even if a large amount is invested. In contrast, a strong top management commitment forIT investment can improve firm performance. Therefore, the top

management's commitment to IT investment has a positive correlation with the market value.

Hypothesis 2d: Firms with strong top management commitment to IT investment will get more excess return.

3.3 Competitive Environment

Firms are always run in a commercial environment, which is calledthe competitive environment. It contains industry characteristics and partner characteristics. Industry characteristics include competitive, regulatory, technological change, product replacement cycle, and other factors which limitIT investment value (Kettinger, Grover, Guha, &Segars, 1994, Kraemer, Dedrick, &Yamashiro, 2000, Hill and Scudder, 2002, Devaraj and Kohli, 2003, Jorgenson, Ho, &Stiroh, 2003). When IT investment crosses organizational boundaries, the business process, IT resources, and non-IT resourcesof trading partners account for a place during the production of IT investment value(Chatfield and Yetton, 2000, Williams and Frolick, 2001, Mukhopadhyay and Kekre, 2002). Therefore, industry characteristics and partner characteristics are contained in a competitive environment. This will be described in detail in the following section.

3.3.1 Industry Characteristics

The relationship between IT investment and firm performance is not only influenced by internal factors, such as the firm's growth rate and the degree of support for IT investments, but also by environmental factors (Wade and Hulland, 2004). Industry characteristics limit the acquisition and successfulapplication of IT (Melville et al., 2004). Thus, research on industry characteristics will clarify the conditions under which IT investment can produce maximum benefits. Based on existing literature and relevant theories, industry characteristics are divided as presented below; Corresponding hypotheses arealso proposed.

The first dimension is in accordance with the competitive degree of the industry, which can be measured as Herfindahl-Hirschman Index, CR4. In a highly competitive market, firms may applyIT more effectively. However, the profit margins may decline. The value they get from the use of IT may be lost because of competition. In contrast, in a mild competitive environment, firms may improve profit marginswithout increasing productivity. Combined with existing empirical evidence, Melville et al.considerthat the higher the level of industry competition, the lower the margin obtained from IT (Melville et al., 2004). Thus, when the degree of industry competition is low, IT investment announcements offirms will lead to greater gains.

Hypothesis 3a: IT investment announcementsby firms in a low-degree competition industry will lead to excess gain.

The second dimension isin accordance with the rolesthat IT occupies. The strategic roles of IT in the industry are classified into four types: automate, information-up, information-down, and strategic transformation. Researchsuggests that the value chain's organizational structure will change whenstrategic transformation becomesmainstream in the industry (Dehning et al., 2003). The market will divide the industry members into strategic groups, with each group representing a unique competitive strategy and having a different level of profitability. More importantly, the entire industry produces more profit. Announcing IT investment in an IT-enabled transformation industry sends a signal thatthe firm is a member of the strategy team who has better profitability. Therefore, the firmsthat announce IT investment in the IT-enabled strategic transformation industry will get higher excess return.

Hypothesis 3b: Firms that announce IT investment in the IT-enabled strategic transformation industry will get higher excess gain.

3.3.2 Partner Characteristics

IT blurs organizational boundaries. Many firms are linked through electronic networks and software applications, as well as the merger of their business processes (Hammer, 2001, Straub and Watson, 2001, Mukhopadhyay and Kekre, 2002, Basu and Blanning, 2003). Thus, trading partners have an impact on the production of IT investment value (Clemons and Row, 1993, Bakos and Nault, 1997, Chatfield and Yetton, 2000). For example, the inefficient business processes of trading partners and obsolete technology limit the acquisition of business values of cross-organizational IT systems. In some cases, this will encourage firms to cooperate with partners for them to improve together (Williams and Frolick, 2001). Based on existing research and related theories, the partner characteristics are divided as presented below, and the corresponding hypotheses are proposed.

The first dimension is in accordance with the partners' degree of support forIT implementation. Partner resources, including IT and non-IT resources, and business processes are important factors that can drive firmsto implement IT successfully (Riggins andMukhopadhyay, 1994). The successful implementation of SCM and other firm systems largely depend on the level of IT ofthe partners andthe senior leadership's support. Thus, the higher the support of

the partners, the higher the likelihood of successful implementation and thegreater the benefits gained fromit. This will lead to a higher increase in firm market value.

Hypothesis 4a: The partners' degree of support for IT investment has a positive correlation with the abnormal return which IT investment announcements bring.

The second dimension isin accordance with the power of firms. Although there are many concepts of power, in the context of partnership, it is explained as market power that controlsresources and information (Melville et al., 2004). One example of an extreme case is the implementation of IT investment in a monopoly position. The firm has significant market power which controlsresources and information, and its partners cannot share the benefits of the investment. Thus, the monopoly will get all the benefits. As Horton describes, power is essential for strategy and information systems (Horton, 2003). According to Jasperson, Carte, Saunders, Butler, Croes, &Zheng (2002), "IT innovation and the introduction can be seen as a process during which the stakeholder groups use their power purposefully to influence the nature of system." IT strengthens and consolidatesthe differentiationin power (Jarvenpaa and Leidner, 1998). Therefore,IT investment announcementsby firms with great power will get a higher excess return.

Hypothesis 4b: IT investment announcementsby firms with great power will get a higher excess gain.

3.4 Country Characteristics

The last characteristics are country characteristics. They are expressed as the specific factors which limit IT investment valuein a country or between countries. They include government promotion, technology development, the information industry, IT talent, information infrastructure, and mainstream IT culture. For example,firms in developing countriesfaceIT limitation applied in education, personnel, infrastructure, and culture[0]. Based on existing research and related theories, country characteristics are divided as presented below and corresponding hypotheses are proposed.

The countries are divided into developed and developing countries. Based on the catching-up theory, the technology development in developing countries lags behind those of developed countries. This situation provides the firms of developing countries a good opportunity to identify the most effective technology and the optimal time of adoption. Thus, failure risk will be significantly reduced. On the other hand, even if the technologies are not the most advanced, they are very innovative in the local markets of developing countries. Based on this theory, IT investment in developing countries will gain higher returns. Meng and Lee (2007) indicate thatthe abnormal return IT investment announcements bring in China is significantly positive. However, abnormal return in the United States is not significant. Thus, IT investment in developing countries can achieve higher abnormal return.

Hypothesis 5: IT investment announcements by firms in developing countries can achieve higher abnormal return.

4. Methodology

An event study is a statistical method to assess the impact of an event on the value of a firm, such as its mergers, acquisitions, earnings announcements, refinancing behavior, etc. The impact could be reflected in the following indicators: mean price effect, the change of variance of market return (reflecting the change in stock price volatility), stock volume change, business (accounting) performance changes. The event study method has been widely used in economics, finance and accounting. For example, in the field of accounting, effects of earnings announcement on stock price have been closely watched. In the legal and economic fields, the event study method has been used to test the regulatory effect, and to assess the liability losses and so on.

The event study method includes two time windows, one is the event window, the other is the estimation window. The event window is a period used to test whether there is stock price's abnormal reflection when the events happen. The estimation window is a period used to estimate expected normal return or estimate the parameters of models. The event study method can use many models to estimate the expected normal return, such as constant mean return model, market model, and Arbitrage Pricing Theory (APT) model. Since the application of market model is much easier than APT model and the effectiveness of market model is better than constant mean return model and as good as APT model, majority of studies have employed market model in the event study method (Brownand Weinstein 1985). Thus, we also use market model in our study.

Market model is a statistical model which associates a stock return with market return, which is shown as follows:

$$R_{it} = \alpha_i + \beta_i \bullet R_{mt} + \xi_{it} \quad (3)$$

α_i and β_i are estimated market model parameters. β_i means sensitivity of stock i to market return, while

α_i depends on the characteristics of stock i. Here, t represents any days in the estimation window. R_{it} and R_{mt} are stock i 's return and market return respectively on the t day in the estimation window.

Using α_i and β_i obtained from formula 3, we can predict the expected normal return R^*_{iT} of stock i on the T day in the event window with formula 4.

$$R^*_{iT} = \alpha_i + \beta_i \bullet R_{mT} \tag{4}$$

Here, T represents any days in the event window; R_{mT} represents market return on the T day; R^*_{iT} represents the expected normal return on the T day.

Further, we calculate the abnormal return (AR_{iT}) of stock i on the T day in the event window:

$$AR_{iT} = R_{iT} - R^*_{iT} \tag{5}$$

Here, R_{iT} is the real return of stock i on the T day in the event window.

According to the definition of Judge et al (1988), we calculate the variance of the abnormal return of stock i on the T day in the event window as follows:

$$VAR(AR_{iT}) = \left(\sigma_I^2 \left[1 + \frac{1}{L_1} + \frac{\left(R_{mT} - \overline{R_m}\right)^2}{\sum_{t=T_0+1}^{T_1} \left(R_{mt} - \overline{R_m}\right)^2} \right] \right) \tag{6}$$

σ_I is the standard variance of stock i's return in the estimation window. L_1 is the length of the estimation window, R_{mT} is market return on the T day in the event window, $\overline{R_m}$ is the mean of R_{mt} in the estimation window.

Cumulative abnormal return (CAR) is the all days'accumulation of the average of all stocks' abnormal return in the event window, which is calculated as follows:

$$AR_T = \frac{1}{N}\sum_{i=1}^{N} AR_{iT}, \ N \text{ is the number of stocks} \tag{7}$$

$$Var(AR_T) = \frac{1}{N^2}\sum_{i=1}^{N} Var(AR_{iT}) \tag{8}$$

$$CAR = \sum_T AR_T \tag{9}$$

$$VAR(CAR) = \sum_T Var(AR_T) \tag{10}$$

Here, AR_T is the average of all stocks' abnormal return on the T day. $Var(AR_T)$ is the variance of AR_T , $VAR(CAR)$ is the variance of CAR.

Null hypothesis usually is that the mean of CAR is zero,while alternative hypothesis is that the mean of CAR is not zero. We use the following t test (Subramani and Walden 2001):

$$J_1 = \frac{CAR}{\{Var[CAR]\}^{\frac{1}{2}}} \sim t(N-1) \tag{11}$$

5. Contribution and Limitations

The current paper reviewsempirical studies onthe impact of IT investment announcements on firm market value over the years. Through the analysis of existing literature and related theories, an integration model ofthe impact of IT investment announcements onfirm market value is proposed. The current article classifies the factors that affectIT investment value into IT investment characteristics, firm characteristics, competitive environment (including industry characteristics andpartner characteristics), and country characteristics. Each characteristic is elaborated and corresponding hypotheses are proposed. The model gives aclear understanding of the research situation and acomprehensive view of the factors that influence IT investment. This knowledge is helpful for future research. The hypotheses proposed according to the characteristics answer the question of which situation IT investment can get the maximum return. The findings in this paper provide guidance for future empirical research and for the

decisionmakers of firms.

However, this article also has some limitations. Recent studies indicate that interaction effects are very important for IS (Chin, Marcolin, &Newsted, 2003). The previous inconsistent results in the empirical researchmay be caused by the lack of consideration of the interactions (Cavaye, 1995, Chin, Marcolin, &Newsted, 2003). The traditional asset evaluation theory points out that the firms' share prices are adjusted according to IT characteristics, firm characteristics, competitive environment, and country characteristics (Fama and French, 1992)0. The impact of specific IT investments on firm value may vary depending on other characteristics. Therefore, the interaction effectcannot be ignored (Oh et al., 2006). The current article does not discuss the interaction effect in the integrated model because the interaction impact between characteristics has a relationship with the specific project of IT investments. The authors intend to analyze this interaction in the specific empirical research in the future. Although some hypotheseshave been supported by empirical studies, previous studies have rarely considered the five characteristics comprehensively, and the conclusionsare inconsistent on some of the characteristics. In addition, some other characteristics are not touched by empirical studies. Therefore, the integrated model needs further examination, which is the authors' future research direction.

Reference

Agrawal, M., Kishore, R., & Rao, H. R. (2006). Market reactions to E-business outsourcing announcements: An event study. *Information & Management*, 43(7), 861-873. http://dx.doi.org/10.1016/j.im.2006.08.002

Aral, S., & Weill, P. (2007). IT assets, organizational capabilities and firm performance: How resource allocations and organizational differences explain performance variation. *Organization Science*, 18(5), 763-780. http://dx.doi.org/10.1287/orsc.1070.0306

Armstrong, C. P., & Sambamurthy, V. (1999). Information technology assimilation in Firms: The influence of senior leadership and IT infrastructures. *Information Systems Research*, 10(4), 304-327. http://dx.doi.org/10.1287/isre.10.4.304

Bakos, J. Y., & Nault, B. R. (1997). Ownership and investment in electronic networks. *Information Systems Research*, 8(4), 321-341. http://dx.doi.org/10.1287/isre.8.4.321

Ball, R., & Brown, P. (1968). An empirical evaluation of accounting income numbers. *Journal of Accounting Research*, 6(2), 159-178. http://dx.doi.org/10.2307/2490232

Barua, A., & Mukhopadhyay, T. (2000). Information Technology and Business Performance: Past, Present and Future.In: Zumd R W (Ed), *Framing the Domains of IT Management: Projecting the Future through Past*. Pinnaflex Educational Resources, Cincinnnati, OH, 65-84.

Basu, A., & Blanning, R. W. (2003). Synthesis and decomposition of processes in organizations. *Information Systems Research*, 14(4), 337-355. http://dx.doi.org/10.1287/isre.14.4.337.24901

Berndt, E. R., & Morrison, C. J. (1994).Assessing the productivity of information technology equipment in the U.S. manufacturing industries.National Bureau of Economic, Researching Working Paper 3582.

Brown, S. J., Warner, J. B. (1985). Using daily stock returns: The case of event studies. *Journal of Financial Economics*, 14(1), 3-31. http://dx.doi.org/10.1016/0304-405X(85)90042-X

Brown S. J., & Weinstein M. I. (1985). Derived factors in event studies. *Journal of Financial Economics*, 14(3), 491-495. http://dx.doi.org/10.1016/0304-405X(85)90010-8

Brynjolfsson, E., & Hitt, L. (1995). Information technology as a factor of production: The role of difference among Firms. *Economics of Innovation and New Technology*, 3(4), 183-199. http://dx.doi.org/10.1080/10438599500000002

Brynjolfsson, E., & Hitt, L. (1996). Paradox lost? Firm-level evidence on the returns to information systems spending.*Management Science*, 42(4), 541-557. http://dx.doi.org/10.1287/mnsc.42.4.541

Cavaye, A. (1995). User participation in system development revisited. *Information and Management*, 28(5), 311–323. http://dx.doi.org/10.1016/0378-7206(94)00053-L

Chatfield, A, T., & Yetton, P. (2000). Strategic payoff from EDI as a function of EDI embeddedness. *Journal of Management Information Systems*, 16(4), 195-224.

Chatterjee, D., Pacini, C., & Sambamurthy, V. (2002). The shareholder-wealth and trading-volume effects of information-technology infrastructure investments. *Journal of Management Information Systems*, 19(2), 7-42.

Chatterjee, D., Richardson, V. J., & Zmud, R. W. (2001). Examining the shareholder wealth effects of

announcements of newly created CIO positions. *MIS Quarterly*, 25(1), 43-70. http://dx.doi.org/10.2307/3250958

Chin, W., Marcolin, B., & Newsted, P. (2003). Partial least squares latent variable modeling approach for measuring interaction effects: Results from a Monte Carlo simulation study and voice mail emotion/adoption study. *Information Systems Research*, 14(2), 189-217. http://dx.doi.org/10.1287/isre.14.2.189.16018

Clemons, E., Thatcher, M., & Row, M.(1995). Identifying sources of reengineering failures: A study of the behavior factors contributing to reengineering risks. *Journal of Management Information Systems*, 12(2), 9–36.

Clemons, E. K., & Row, M. C. (1993). Limits to interfirm coordination through information technology: Results of a field study in consumer packaged goods distribution. *Journal of Management Information Systems*, 10(1), 73-95.

Dardan, S., Stylianou, A.., & Kumar, R. (2006).The impact of custmer-related IT investment on custmer satisfaction and shareholder returns. *Journal of Computer Information Systems*, 47(2), 100-111.

Dehning, B., Richardson, V. J., Urbaczewski, A., & Wells, J. D. (2004). Reexamining the value relevance of e-commerce initiatives. *Journal of Management Information Systems*, 21(1), 55-82.

Dehning, B., Richardson, V. J., & Zmud, R. W. (2003). The value relevance of announcements of transformational information technology investments. *MIS Quarterly*, 27(4), 637-656.

Devaraj, S., & Kohli, R. (2003). Performance impacts of information technology: Is actual usage the missing link. *Management Science*, 49(3), 273-289. http://dx.doi.org/10.1287/mnsc.49.3.273.12736

Dewan, S., & Min, C. (1998). Firm characteristics and investments in information technology: Scale and scope effects. *Information Systems Research*, 9(3), 219-232. http://dx.doi.org/10.1287/isre.9.3.219

Dewan, S., & Ren, F. (2007). Risk and return of information technology initiatives: Evidence from electronic commerce announcements. Information Systems Research, 18(4), 370-394. http://dx.doi.org/10.1287/isre.1070.0120

Dos Santos, B. L., Peffers, & K., Mauer, D. C. (1993). The impact of infomation technology investment announcements on the market value of the firm. *Information Systems Research*, 4(1), 1-23. http://dx.doi.org/10.1287/isre.4.1.1

Fama, E. F., & French, K. R. (1992). The cross-section of expected stock returns. *Journal of Finance*, 47(2), 427-465. http://dx.doi.org/10.2307/2329112

Fergusona, C., Finnb, F., & Hall, J. (2005). Electronic commerce investments, the resource-based view of the firm, and firm market value. *International Journal of Accounting Information Systems*, 6(1), 5-29. http://dx.doi.org/10.1016/j.accinf.2004.08.001

Galbraith, J. R. (1977). *Organization Design*. Reading, MA: Addison-Wesley.

Gurbaxani, V., & Whang, S.(1991). The impact of information systems on organizations and markets. *Communications of the ACM*, 34(1), 59-73. http://dx.doi.org/10.1145/99977.99990

Hammer, M. (2001). The superefficient company. *Harvard Business Review*, 79(8), 82-91.

Harris, S. E., & Katz, J. L. (1991). Organizational performance and information technology investment intensity in the insurance industry.*Organization Science*, 2(3), 263-295. http://dx.doi.org/10.1287/orsc.2.3.263

Hayes, D. C., Hunton, J. E., & Reck, J. L. (2000). Information systems outsourcing announcement: Investigating the impact on the market value of contract-granting firm. *Journal of Information Systems*, 14(2), 109-125. http://dx.doi.org/10.2308/jis.2000.14.2.109

Hayes, D. C., Hunton, J. E., & Reck, J. L.(2001). Market reaction to ERP implementation announcements. *Journal of Information Systems*, 15(1), 3-18. http://dx.doi.org/10.2308/jis.2001.15.1.3

Hill, C. A., & Scudder, G. D. (2002).The use of electronic data interchanges for supply chain coordination in the food industry. *Journal of Operations Management*, 20(4), 375-387. http://dx.doi.org/10.1016/S0272-6963(02)00017-7

Horton, K. S. (2003). Strategy, practice, and the dynamics of Power. *Journal of business research*, 56(2), 121-126. http://dx.doi.org/10.1016/S0148-2963(01)00284-3

Im, K. S., Dow, K. E., & Grover, V. (2001). Research report: A reexamination of IT investment and the market value of the firm - An event study methodology. *Information Systems Research*, 12(1), 103-117. http://dx.doi.org/10.1287/isre.12.1.103.9718

Jarvenpaa, S. L., & Leidner, D. E. (1998). An information company in Mexico: Extending the resource-based view of the firm to a developing country context. *Information Systems Research*, 9(4), 342-361.

http://dx.doi.org/10.1287/isre.9.4.342

Jasperson, J., Carte, T. A., Saunders, C. S., Butler, B. S., Croes, H. J. P., & Zheng, W. (2002). Power and information technology research: A metatriangulation review. *MIS Quarterly*, 26(4), 397-459. http://dx.doi.org/10.2307/4132315

Jorgenson, D. W., Ho, M. S., & Stiroh, K. J. (2003). Growth of U.S. industries and investments in information technology and higher education. *Economic Systems Research*, 15(3), 279-325. http://dx.doi.org/10.1080/0953531032000111781

Keen, P. G. W. (1988). *Competing in time using telecommunications for competitive advantage*. Cambridge: Ballinger Publishing Company.

Kettinger, W. J., Grover, V., Guha, S., & Segars, A. (1994). Strategic information systems revisited: A study in sustainability and performance. *MIS Quarterly*,18(1), 31-58. http://dx.doi.org/10.2307/249609

Khallaf, A., & Skantz, T. R. (2007). The effects of information technology expertise on the market value of a firm. *Journal of Information Systems*, 21(1), 83-105. http://dx.doi.org/10.2308/jis.2007.21.1.83

Kraemer, K. L., Dedrick, J., & Yamashiro, S. (2000). Refining and extending the business model with information technology: Dell Computer Corporation. *The Information Society*, 16(1), 5-21. http://dx.doi.org/10.1080/019722400128293

Lee, H. G., Cho, D. H., & Lee, S. C. (2002). Impact of e-business initiatives on firm value. *Electronic Commerce Research and Applications*, 1(1), 41-56. http://dx.doi.org/10.1016/S1567-4223(02)00005-4

Lin, J. C., Jang, W. Y., & Chen, K. J. (2007). Assessing the market valuation of e-service initiatives. *International Journal of Service Industry Management*, 18(3), 224-245. http://dx.doi.org/10.1108/09564230710751460

Loveman, G. W. (1994). *An assessment of the productivity impact of information technologies*. Cambridge: Oxford University press.

Lucas, H. (1999). *Information tchnology and the poductivitypradox: The search for value*. Oxford: Oxford University Press.

Mascarenhas, B. (1992). First mover effects in multiple dynamic markets. *Strategic Management Journal*, 13(3), 237-243. http://dx.doi.org/10.1002/smj.4250130306

Melville, N., Kraemer, K., & Gurbaxani, V. (2004). Review: Information technology and organizational performance: An integrative model of IT business value. *MIS Quarterly*, 28(2), 283-313.

Meng, Z. L., & Lee, S. Y. (2007). The value of IT to Firms in a developing country in the catch-up process: An empirical comparison of China and the United States. *Decision Support Systems*, 43(3), 737-745. http://dx.doi.org/10.1016/j.dss.2006.12.007

Mukhopadhyay, T., & Kekre, S. (2002). Strategic and operational benefits of electronic integration in B2B procurement processes. *Management Science*, 48(10), 1301-1313. http://dx.doi.org/10.1287/mnsc.48.10.1301.273

Neo, B. S. (1988). Factors facilitating the use of information technology for competitive advantage: An exploratory study. *Information and Management*, 15(4), 191-201. http://dx.doi.org/10.1016/0378-7206(88)90045-6

Oh, W., & Gallivan, M. J. (2004). An empirical assessment of transaction risks of It outsourcing arrangement: An Event Study. *In: Proceedings of the 37th Hawaii International Conference on System Sciences*.

Oh, W., Gallivan, M. J., & Kim, J. W. (2006). The market's perception of the transactional risks of information technology outsourcing announcements. *Journal of Management Information Systems*, 22(4), 271-303. http://dx.doi.org/10.2753/MIS0742-1222220410

Oh, W., Kim, J. W., & Richardson, V. J. (2006). The moderating effect of context on the market reaction to IT investment. *Journal of Information Systems*, 20(1), 19-44. http://dx.doi.org/10.2308/jis.2006.20.1.19

Peak, D. A., Windsor, J. C., & Conover, J. (2002). Risks and effects of IS/IT outsourcing: A securities market assessment. *Journal of Information Technology Cases and Applications*, 4(1), 6-33.

Porter, M. E., & Millar, V. E. (1985). How information gives you competitive advantage. *Harvard Business Review*, 63(4), 149-160.

Ranganathan, C., & Brown, C. V. (2006). ERP investment and the market value of Firms: Toward an understanding of influential ERP project variables. *Information Systems Research*, 17(2), 145-161. http://dx.doi.org/10.1287/isre.1060.0084

Richardson, V. J., & Zmud, R. W.(2002). The Value Relevance of Information Technology Investments Announcements: Incorporating Industry Strategic IT Role. *In Proceedings of the 35th Hawaii International Conference on System Science*. USA, Hawaii. http://dx.doi.org/10.1109/HICSS.2002.994251

Riggins, F. J., & Mukhopadhyay, T. (1994). Interdependent benefits from interorganizational systems: Opportunities for business partner reengineering. *Journal of Management Information Systems*, 11(2), 37-57.

Ross, J. W., Beath, C. M., & Goodhue, D. L. (1996). Develop long-term competitiveness through IT assets. *Sloan Management Review*, 38(1), 31-42.

Sabherwal, R., & Sabherwal, S. (2005). Knowledge management using information technology: Determinants of short-term impact on firm value. *Decision Sciences*, 36(4), 531-567. http://dx.doi.org/10.1111/j.1540-5414.2005.00102.x

Sabherwal, R., & Sabherwal, S. (2007). How do knowledge management announcements affect firm value? A study of Firms pursuing different business strategies. *IEEE Transactions on Engineering Management*, 54(3), 409-422. http://dx.doi.org/10.1109/TEM.2007.900785

Sambamurthy, V. A., & Bharadwaj, V. G. (2003). Shaping agility through digital options: Reconceptualizing the role of information technology in contemporary Firms. *MIS Quarterly*, 27(2), 237-263.

Schein, E. H. (1992). *The role of the CEO in the management of change: The case of information technology*. Oxford: Oxford University Press.

Schumpeter, J. A. (1950). *Capitalism, socialism, and democracy*. New York: Harper.

Smith, C., & Watts, R. (1992).The investment opportunity set and corporate financing, dividend, and compensation policies. *Journal of Financial Economics*, 32(3), 263-292. http://dx.doi.org/10.1016/0304-405X(92)90029-W

Straub, D. W., & Watson, R. T. (2001). Transformational issues in researching IS and Net-enabled organizations. *Information Systems Research*, 12(4), 337-345. http://dx.doi.org/10.1287/isre.12.4.337.9706

Porter, M. E. (1985).*Competitive Advantage: Creating and Sustaining Superior Performance*. New York: Free Press.

Subramani, M., & Walden, E. (2001). The impact of e-commerce announcements on the market value of Firms. *Information Systems Research*, 12(2), 135-154. http://dx.doi.org/10.1287/isre.12.2.135.9698

Teo, T. S. H., Wong, P. K., & Chia, E. H. (2000). Information technology (IT) investment and the role of a firm: An exploratory study. *International Journal of Information Management*, 20(4), 269-286. http://dx.doi.org/10.1016/S0268-4012(00)00016-5

Wade, M., & Hulland, J. (2004). Review: The resource-based view and information systems research: Review, extension, and suggestions for future research. *MIS Quarterly*, 28(1), 107-142.

Williams, M. L., & Frolick, M. N. (2001).The evolution of EDI for competitive advantage: The FedEx case. *Information Systems Management*, 18(2), 47-53. http://dx.doi.org/10.1201/1078/43195.18.2.20010301/31277.8

Zuboff, S. (1988). *In the age of the smart machine.The future of work and power*. New York: Basic Books.

Table 1. Statistics of Research Papers

Research Objects	MISQ	ISR	JMIS	DSS	JIS	Others	Total
Investment Related IT	1	2	1	1	1	2	8
E-Business	0	2	1	0	0	3	6
Enterprise System	0	1	0	0	1	0	2
Knowledge Management	0	0	0	0	0	2	2
IT Outsourcing	0	0	1	0	1	3	5
IT Staff	1	0	0	0	1	0	2
Total	2	5	3	1	4	10	25

Others include Journal of Computer Information Systems, Hawaii International Conference on System Science, Electronic Commerce Research and Applications, International Journal of Accounting Information Systems, Decision Sciences, IEEE Transactions on Engineering Management, Journal of Information Technology Cases and Applications, Information and Management.

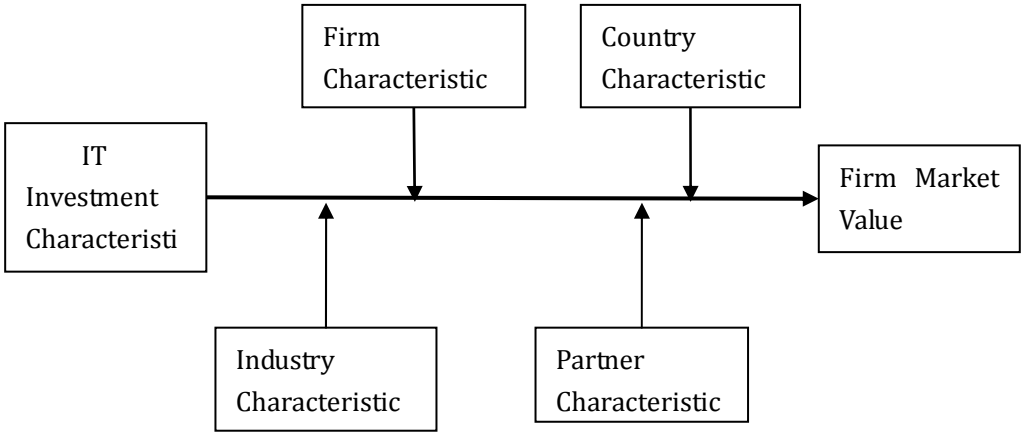

Figure 1. The Integration Model of Impact of IT Investment Announcements on the Market Value of Firms

The Export Growth and Revealed Comparative Advantage of the New Zealand Kiwifruit Industry

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Abstract

This paper investigates the growth of New Zealand's Kiwifruit production and exports between 1981 and 2011. It analyses the industry's history, current status, and its future prospects and challenges. It includes a statistical analysis of the development of the industry. Export volumes by market are reported for the relevant period. Revealed comparative advantage methodology is used to determine whether New Zealand has a comparative advantage in Kiwifruit. Econometric analysis is employed to identify the key determinants of Kiwifruit exports. The analysis shows that New Zealand Kiwifruit has been an export success during the last three decades. This success has been accompanied by fluctuations and challenges characteristic of many markets. The estimates of revealed comparative advantage demonstrate that New Zealand has very high degree of comparative advantage in Kiwifruit. Empirical analysis suggests that domestic and trading partners' incomes, market size and seasonality are key determinants of Kiwifruit exports.

Keywords: Kiwifruit, Zespri, Exports, Revealed Comparative Advantage, Horticulture

1. Introduction

In the 30 years from 1981 to 2011 the New Zealand Kiwifruit industry developed from a marginal activity to a major export industry. By the 1990s, Kiwifruit was being sold to multiple markets that included Western Europe, North America and Asia. Subsequently the growth has continued as the commercialisation of a new variety provided new opportunities.

This paper examines the evolution of New Zealand's Kiwifruit industry over time. It discusses the determinants of Kiwifruit export growth and the major challenges that confront the industry, particularly in the export market. The revealed comparative advantage methodology developed by Balassa (1965) is used to establish whether New Zealand has comparative advantage in Kiwifruit production and export. Finally, using selected hypotheses drawn from trade and international business theories, regression analysis is used to identify the key determinants of New Zealand Kiwifruit exports.

2. The Beginning of the Kiwifruit Industry in New Zealand

Kiwifruit is a high-quality fruit known for its taste and health attributes. Sliced Kiwifruit has long been used as dessert fruit. In many markets Kiwifruit is now consumed both as a breakfast fruit and a lunch fruit. It has been suggested that the fruit's health characteristics have been critical in its acceptance by consumers.

Understanding the contemporary kiwifruit industry in New Zealand requires consideration of its origins.

The New Zealand Kiwifruit industry originated from a historic import from China. The Kiwifruit is native to the Yangtze River valley of northern China and Zhejiang Province on the coast of Eastern China. The Kiwifruit seeds

were originally brought to New Zealand from China in 1904 by Isabel Fraser, a missionary and educator. Subsequently in 1925, Hayward Wright, a New Zealand horticulturalist, produced the well-known green Kiwifruit which came to be known as the Hayward variety (Zespri, 2007). Initially there was only private production and consumption. However, in the 1940s the first commercial orchard started producing Kiwifruit for the domestic market and small domestic markets emerged. This was followed by an initial exploration of the international market.

The number of exporting firms rose from four in 1964 to fourteen in 1974 (Zwart and Moore, 1990). By 1976 the exported crop exceeded local consumption for the first time. It was during this period that the name 'Kiwifruit' started being used primarily as an attempt to minimise duties in export marketing. The name change was initiated by an American importer, Norman Sondag of the Ziel Company in San Francisco. Turners and Growers, who were leading exporters of the day, had sent him the berries under the novel name 'melonettes', which for his business was even worse than calling them 'Chinese gooseberries', as both melons and berries attracted high import tariffs at the time. So at a company meeting in Sir Harvey Turner's office in June 1959, Jack Turner came up with the name 'kiwifruit' which was accepted. So, in 1959 the name Chinese gooseberry was changed becoming kiwifruit, after New Zealand's national bird, the kiwi – small, brown and furry, like the fruit (Wikipedia, 2007).

In the late 1970s, research was undertaken seeking to develop new varieties of Kiwifruit. Progress was slow but there was some success with the *Zespri® Gold* production moving from limited trials to exports commencing in 1998. The industry thus evolved from a one-fruit industry to a two-fruit industry.

Figure 1 shows that export value has increased over time, although there were fluctuations and a period of stagnation in the 1990s. Significant export growth occurred between 1981 and 1990, when the volume increased from 10 million to more than 60 million trays. Strong growth also occurred between 2003 and 2008.

Despite the importance of this industry to the New Zealand economy there has little economic analysis of it performance and success. Government and industry analysts have written numerous reports with many of them focusing on current production and market conditions and the legislation and regulations governing export of kiwifruit. Yerex and Haines, (1983) wrote a history of the industry and Kilgour et. al. (2009) presented industry and commentator perceptions of success factors underpinning the industry's growth.

3. Global Development of Kiwifruit Markets

New Zealand Kiwifruit production should be considered in its global context. Kiwifruit is consumed around the world with the majority of production consumed after export from its country of production.

The import demand for Kiwifruit remains strong in the EU with the strongest growth being registered in Italy and Spain. As incomes in many countries increased, imports (especially from new emerging markets) also increased, particularly in Asia. In Asia, growth in Kiwifruit sales has been particularly strong in South Korea, Taiwan and Hong Kong. Strong growth was also experienced in Japan, New Zealand's oldest Asian market, in the years 2004, 2005 and in 2009. However, heavy reliance on a few major markets is expected to remain, with the top ten importing countries consistently taking in almost 70 per cent of total world imports. (see Table 1). The OECD countries accounted for about 85% of world imports of Kiwifruit (World Kiwifruit Review, 2006, 2010 and 2011).

World Kiwifruit production is concentrated amongst a few countries, with the top ten producing countries contributing over 95 per cent of world production. Table 2 shows the volume and ranking of the major producing countries since 1993. Traditionally, Italy, New Zealand and Chile have been the largest exporters and have also dominated world Kiwifruit production. However, China joined these three countries as a major producer since 2005 (World Kiwifruit Review, 2011).

All countries in the top ten in 2008-2011 (with the exception of France, Japan and the United States) increased production compared to the 2003-2005 period. Portugal dropped out of the top ten despite modest increases in production, while Iran has increased production to move up to 8th in 2008-2011.

World demand for Kiwifruit increased significantly between 1984 and 2009. World imports of Kiwifruit averaged only 16 300 metric tonnes in 1982-1984, but exceeded 1.1 million metric tonnes in 2009. However, imports of three competing tropical fruits - fresh mangoes, fresh papaya and fresh pineapples - increased even more dramatically over the period. (World Kiwifruit Review, 2006, 2010, 2011). For instance US imports of pineapples have increased 6.5 times, mango and guava 2.4 times, and papaya 4.7 times, between1995 and 2010, and together they now total 1.4 million MT. In value terms the import of these three fruits increased from USD 300 million in 1995 to over USD 1.3 billion in 2010. Similarly in the EU, pineapples imports have increased 3.7 times, mangoes and guava 4.2 times and papaya 3.4 times in the same period and now total nearly 1.8 million MT. The import values increased from 353 to 1298 million Euros, (World Kiwifruit Review, 2011, pp. 20-21).

4. New Zealand Kiwifruit Exports

New Zealand's world market share in Kiwifruit sales has varied over time. With an estimated share of total world exports in 1990 of over three-quarters, New Zealand had a dominant market position. However, by 2000 this share had fallen to under a third due to rapid production growth elsewhere. In 2009, this value was approximately 31% (World Kiwifruit Review, 2006, 2011).

Kiwifruit exports earned $987 million dollars in 2009, making up over 30 percent of New Zealand's total horticultural export earnings (Statistics New Zealand 2011). This value comes from the production of 360,000 MT of (World Kiwifruit Reviw, 2011) which were supplied by 2,754 Kiwifruit growers (Zespri, 2011).

This significant growth in export value is not common for horticultural products where there is significant competition from other fruits as well as competition from alternative suppliers of the same fruit.

Table 3 reports export growth in five market destinations for New Zealand's Kiwifruit exports for the period 1984-2009. It is clear from this table that Europe and Asia has been the key to industry growth. The European market has sustained itself (although declined in relative importance). Key Asian markets, (Japan, China, Hong Kong, South Korea and Taiwan), have in aggregate grown significantly as shown in Figure 2. The United States market showed minimal annual growth and seems to have just survived. It should be noted that the poor performance in the American market was largely as a result of New Zealand - United States trade dispute in the early 1990's. Californian growers successfully brought an anti-dumping case against New Zealand exports. The case resulted from a late diversion of a shipment of NZ kiwifruit to Japan which was redirected to California and which adversely impacted market prices. This displaced NZ Kiwifruuit for nearly a decade. The Australian market has progressed, but is still relatively small and other markets consist of low demand nations which have provided fluctuating revenues. Given the importance of Asian markets further comment is appropriate.

Although New Zealand kiwifruit is exported to many countries in Asia, only five are important. Figure 2 shows the declining relative importance of Japan (although it is still dominant) as China, Hong Kong, Korea and Taiwan have emerged as important markets. Figure 3 shows that Taiwan remains an important export market, but is now only the third biggest market in Asia due to the dramatic rise of Korea since 2000. Hong Kong and China have also emerged as significant markets, but each still comprises only about 4 percent of New Zealand kiwifruit exports to key Asian markets.

It is also important to consider the speed as well as the fluctuations of market growth, as shown in Figure 3. During the last decade, China experienced declines during 2001, 2002 and 2003, as did Hong Kong in 1998, 1999, 2002 and 2003, Japan in 2001, 2003 and 2005, Korea in 1998 and 2005, and Taiwan in 1998, 1998, 2003 and 2004. By contrast, China experienced more than 50 percent growth in 1998, 2005 and 2006, as did Hong Kong in 2000 and 2001, Japan in 2004, and Korea in 2001 and 2004. These fluctuations provide challenges and opportunities to kiwifruit exporters as shown in Figure 3.

5. Challenges

Kiwifruit exporting from New Zealand has faced numerous challenges during the last three decades. New Zealand exporters complement the production from the northern hemisphere as a result of the different seasons and weather conditions in the two hemispheres. Providing the product to consumers every week of the year is a continuing challenge for the producers. New Zealand Kiwifruit competes with another significant southern producer, Chile, which has lower costs but is arguably not able to provide the same level of quality. This seems to be the case as higher prices are paid for New Zealand kiwifruit vis a vis Chilean kiwifruit in Asian and other markets. (World Kiwifruit Review 2011, p. 43)

China has also emerged as a significant new player growing the market within China, competing against other Kiwifruit exporters to China and potentially becomes an exporter to other markets.

New Zealand has faced the challenge of introducing a new product to the international market - Zespri gold in 1998. Although the product had consumer appeal, it required different handling systems. The marketing challenge was for the new variety to add international market share rather than cannibalise (adversely affect) the market for green Kiwifruit and for the new product to support the Zespri brand. New Zealand was relatively successful in this. Evidence suggests that both varieties have grown simultaneously. During the period 2001 – 2010 gold Kiwifruit exports nearly tripled from 7.3 million trays to 22.4 million trays while at the same time green Kiwifruit exports increased from 56.5 million trays to 79.8 million trays.

World trade in Kiwifruit faces various trade barriers, tariff as well as non-tariff. One of the most widely used trade policy measures falls under the classification "Sanitary and Phytosanitary" (SPS) negotiated by the World Trade Organization (WTO) at Uruguay round of General Agreement on Tariffs and Trade (GATT) and entered into force

with the establishment of WTO in 1995. This important agreement elaborates rules of GATT 1994, particularly provisions of article XX (b) and intends to help governments implement appropriate measures to protect their domestic animal and plant health and food safety (World Trade Organisation 2005). The 14 articles of the WTO's SPS agreement help prevent substandard Kiwifruits (as well as other products) from entering markets that are conscious of health, environmental and safety considerations.

The significance of international trade rules cannot be understated given the challenges that New Zealand has experienced in the USA market and the potential impact of the trade agreements that Chile is negotiating with various countries. In addition, a Free Trade Agreement between New Zealand and China (signed in 2008) is expected to have a positive impact on NZ exports to the China market and perhaps some imports into the NZ market depending on consumers demand, tastes and preferences.

6. Revealed Comparative Advantage of New Zealand Kiwifruit

Analysts, governments and businesses are concerned about future export prospects. One window on future prospects is Revealed Comparative Advantage (RCA).

Balassa (1965) developed an approach to measure revealed comparative advantage. He assumed that a country's comparative advantage is revealed in its exports to the world market. As such, RCA of exports is represented by a country's commodity composition of exports compared with that of the world. The RCA index is defined as:

$$RCA_{ki} = (X_{ki} / X_{ti}) / (X_{kw} / X_{tw})$$

Where; X_{ki} represents the value of country *i*'s exports of commodity *k*

X_{ti} represents the value of country *i*'s total exports

X_{kw} represents the value of world exports of commodity *k*

X_{tw} represents the value of total world exports (of all commodities)

The RCA of country *i* in the trade of product *k* is measured by that item's share in country's exports relative to its share in the world exports. The first term in the equation represents commodity *k's* share in country *i's* exports, while the second term represents commodity *k's* share in world exports.

If the value of the RCA index is less than unity (indicating that the share of commodity *k* in *i's* exports is less than the corresponding world share), it means that country *i* does not have revealed comparative advantage in commodity *k.* Similarly, if the value of this index exceeds unity, it implies that the country has revealed comparative advantage in that product.

Export data is measured in US dollars and have been taken from UN COMTRADE, the United Nations Commodity trade website. Global exports of Kiwifruit for each year are proxied by the sum of the value of exports from the top ten countries. This should be relatively accurate, as these countries account for 98% of global Kiwifruit production (World Kiwifruit Review 2006 and 2010).

The ten countries in Table 4 represent the major exporters of Kiwifruit. Of these ten countries, six exhibit an RCA value equal to or greater than one in the production of Kiwifruit. New Zealand has a very high RCA in Kiwifruit, with values ranging from 206 in 2000 to 151 in 2005 and increased to 183 in 2007. The 2009 RCA value of 178 falls roughly midway in this range. This reflects the fact that Kiwifruit makes up a significant share of New Zealand's total exports and that the majority of New Zealand's Kiwifruit production is exported. Chile, Greece, and Italy also have strong RCAs in Kiwifruit production and exports, with values in 2009 of 19, 17 and 8, respectively. The strength of the RCA in Kiwifruit has dropped for Chile since 2000 while Greece remained relatively constant prior to 2009. Values for France and Portugal hover around unity, indicating no real advantage or disadvantage. Values for Iran fluctuated highly between 2000 and 2005. Kiwifruit and total export data are unavailable for 2007 and 2009. RCA values for the US, Japan and China are well below one, indicating that although these countries are significant producers of Kiwifruit, it makes up only a small proportion of their national exports.

In summary, the analysis above indicates that the five major Kiwifruit exporters have a RCA in the production and export of Kiwifruit. Some of the smaller countries such as New Zealand, Chile and Greece have the highest levels of RCA for Kiwifruit while larger nations such as the US, China and to some extent Japan have a very low RCA. This is consistent with larger countries often being more diversified economies.

7. Determinants of Demand for Kiwifruit

Testing of selected country-specific hypotheses can provide insight regarding New Zealand Kiwifruit markets. The first two of these hypotheses are based on Linder's demand similarity model (Linder, 1961).

According to Linder (1961), high income generates demand for high quality differentiated products. The argument is that the higher the income, the larger will be the demand for highly quality goods, leading to higher production; large scale production in turn tends to lower per unit costs of production, which generates economies of scale. Higher income tends to increase consumption, but not equally for every product. Demand for inferior and normal goods is expected to decline or increase respectively as a proportion of income. Conversely, the demand for luxury or "super" goods is expected to go up more proportionally as income rises.

Kiwifruit is a product that displays characteristics of a luxury good, so demand is expected to increase with income growth in trading partners. In addition, developed and emerging countries' populations are rapidly increasing their consumption of nutritious food as they modify their eating habits from cheaper products like cereals to products with higher nutritional value such as meat, seafood, vegetables, and fruits such as Kiwifruit.

Testing of country-specific and industry specific hypotheses can provide insight regarding New Zealand Kiwifruit markets. The first two of these hypotheses are based on Linder's (1961) demand and income similarity based model. *Hypothesis 1* states that Kiwifruit export *(KWFX)* is an increasing function of the average level of development (ALDij) of the trading partners, measured as the average per capita incomes of the two countries*, i,* home/reporting country and *j,* trading partner.

$$\delta KWFX_{ij} / \delta ALD_{ij} > 0$$

Hypothesis 2 states that Kiwifruit export *(KWFX)* is an increasing function of the average market size (AMSij) of the trading partners, measured by average GDP of trading partners, or average population of trading partners.

$$\delta KWFX_{ij} / \delta AMS_{ij} > 0$$

Statistics New Zealand data identified 43 trading partners to which New Zealand exported Kiwifruit in 2008. For the purposes of this model, New Zealand is the home/exporting country and each of the partner countries provides an observation in the regressions. The dependent variable used in each case is the value of New Zealand's exports to each importing trading partner in 2008 US dollars. These values are based on 2008 Statistics New Zealand export values to trading partners, converted into US dollars. Population is taken from the World Development Indicators database and is measured in thousands. GDP, which is also sourced from the World Development Indicators database, is measured in millions of US dollars. Distance is also included in the models, as this is a common variable used in econometric 'gravity' models. Distance is measured in kilometres and is the straight-line distance between the capital in the home country and the capital of the partner country. The model is estimated in logarithmic form of the same variables to determine if a better fit can be found. The following four regressions are used:

$$(1)\ \mathrm{X(Kiwifruit)_{ij}} = a + \beta_1 log(Average\ GDP_{ij}) + \beta_2 log(Distance)_{ij} + \beta_3 FTA_{ij}$$

$$(2)\ \mathrm{X}(Kiwifruit)_{ij} = a + \beta_1 log(Average\ Pop_{ij}) + \beta_2 log(Distance)_{ij} + \beta_3 FTA_{ij}$$

$$(3)\ \mathrm{X}(Kiwifruit)_{ij} = a + \beta_1 log(Average\ \mathrm{GDP_{ij}/Pop_{ij}}) + \beta_2 \mathrm{log(Distance)_{ij}} + \beta_3 \mathrm{FTA_{ij}}$$

$$(4)\ \mathrm{X(Kiwifruit)}_{ij} = a + \beta_1 \mathrm{log(Average\ GDP_{ij})} + \beta_2 \mathrm{log(Average\ GDP_{ij}/Pop_{ij})} + \beta_3 \mathrm{log(Distance)_{ij}} + \beta_4 \mathrm{FTA_{ij}}.$$

The log of the distance between the trading partners is included in each regression, as well as a dummy variable which indicates whether there is a free trade agreement (FTA) between the countries. The results are presented in Table 5.

In regression 1, the log of average GDP of the two trading partners has a strong statistically significant and positive effect on the level of exports of Kiwifruit from New Zealand: an increase in average GDP of one percent tends to increase the export of Kiwifruit by 1.18%. The distance and FTA variables also have statistically significant and positive coefficients at the 1% and 5% levels respectively.

Regression 2 uses log population as an explanatory variable. This results in a positive and strong statistically significant coefficient of 0.69. Therefore, an increase in population of 1% tends to increase the export of Kiwifruit by 0.69%. The FTA and distance variables remain statistically significant and positive. The explanatory power of regression 1 is higher than that of regression 2: 49% compared to 38%.

Regression 3 tests the significance of log average GDP per capita as an explanatory variable. This regression shows a strong positive coefficient 3.32, meaning that an increase in GDP per capita of 1% tends to increase the export of Kiwifruit by 3.32%.

Regression 4 uses the log of average GDP per capita as well as average GDP, distance and the FTA dummy variable. Average GDP per capita is not found to be statistically significant in this regression but all other variables are. The regression has a moderately strong explanatory power, with an adjusted r^2 value of 51%.

The results from the log-log regressions carried out above tend to support both hypotheses one and two. The average level of development does seem to have a positive effect on the export of Kiwifruit between New Zealand and its trading partners. However, when both market size and level of development variables are included together in the same regression, the average level of development variable loses its statistical significance. This may suggest a degree of multi-collinearity of the variables. The average market size variable is statistically significant in regressions (1) and (2) from Table 5 and appears to be stronger than development indicators such as GDP per capita as a factor in Kiwifruit exports from New Zealand. The positive and statistically significant coefficient on the dummy variable for free trade agreements is unsurprising, given that the removal of trade barriers in theory should foster higher levels of trade. However, the positive and statistically significant coefficient on distance was somewhat of a surprise. In the context of a gravity model of trade, distance is normally expected to have a negative impact on trade. The coefficients on distance in Table 5 may be explained partially by the fact that the dataset was limited solely to New Zealand exports. The impact from several countries importing a large share of New Zealand's Kiwifruit exports may have influenced this result. However, further regressions using a wider dataset produced either positive or statistically insignificant coefficients for distance. This suggests that distance may not be a significant determinant with regard to the export of luxury goods such as Kiwifruit.

8. Conclusion

During the last three decades, New Zealand's Kiwifruit industry has established itself as a significant exporter. This success has been accompanied by fluctuations and challenges characteristic of many markets. We particularly note the following opportunities and threats to New Zealand's Kiwifruit industry, some of which may need further study:

- The significance of Chile as a southern hemisphere competitor.
- The continuing importance of the Japanese and European markets.
- The growing importance of China, Hong Kong, Korea and Taiwan as market and the
- The emerging Indian market is expected to provide further opportunity for Kiwifruit exporters

RCA estimates and analysis suggest continuing success for the New Zealand Kiwifruit industry but highlights the importance of Chile and Greece who also have significant revealed competitive advantage. However, the RCA analysis does not identify the importance of China where Kiwifruit production growth has been large but still remains a small part of the total economy. It seems China's domestic market is large so there is no significant export growth and share in the world market.

Empirical analysis highlights the importance of per capita income growth, the value of Free Trade Agreements and distance as important determinants of export prospects. The suggest the importance of New Zealand Kiwifruit exporting remaining focused on high income markets with additional efforts being focused on emerging high income markets of significant size such as Brazil, Russia and India.

Distance does not usually show up positive in such models but does so in this case primarily because it is an indication of seasonality. New Zealand Kiwifruit is most valuable in the Northern Hemisphere when there are no fresh local Kiwifruit. An alternative explanation is that it reflects New Zealand's 'clean and green' profile.

In interpreting the results of this study, it is important to be cognizant of product life cycles. The parameters estimated are likely to be sensitive to the emergence (or non-emergence) of new varieties of Kiwifruit and other fresh fruits. Likewise, disease and political variables have the potential to impact future New Zealand production and production from other countries. Changes in incomes and consumer preferences continue to be important, especially in Europe and East Asia. The New Zealand China FTA may also have positive impact on NZ Kiwifruit market share in China's market.

However the industry and other analysts need to be aware that past patterns do not necessarily continue into the future. Exogenous shocks such as disease can potentially have devastating effects. The *e. coli* poisonings in Europe during June 2011 severely disrupted horticultural trade. Currently the outbreak of *Pseudomonas syringae pv. Actinidiae* (PSA) in NZ Kiwifruit orchards has generated considerable industry anxiety as efforts are made to control its spread and reduce its impact.

This study highlights the value of future research modeling Kiwifruit production and trade patterns under different economic growth scenarios in individual countries. Such modeling if associated with different assumptions about demand elasticities for Kiwifruit and cross–elasticities with other fruit could provide significant guidance for exporters seeking to determine optimal export volumes and placements. It also provides a platform for consideration of dynamic comparative advantage along with the traditional RCA measures used in this paper.

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References

Kilgour, M., Saunders, C., Scrimgeour, F., & Zellman, E. (2008). The key elements of success and failure in the New Zealand kiwifruit industry. (Research report No. 311). Canterbury, New Zealand: Kilgour, Agribusiness and Economic Research Unit of Lincoln University.

Balassa, B. (1965). Trade liberalization and "revealed" comparative advantage. *The Manchester School of Economics and Social Studies, 33,* 99-123. http://dx.doi.org/10.1111/j.1467-9957.1965.tb00050.x

Belrose Inc. (2011). *World Kiwifruit Review.* Pullman, WA.

Belrose Inc. (2010). *World Kiwifruit Review.* Pullman, WA.

Belrose Inc. (2006). *World Kiwifruit Review*. Pullman, WA.

Kiwifruit. (2007). In *Wikipedia online*. Retrieved from http://www.zesprikiwi.com/kiwi_name.htm

Linder, S. B. (1961). *An essay on trade and transformation*. New York, NY: John Wily & Sons.

Statistics New Zealand. (2010). *Infoshare database*. Retrieved from http://www.stats.govt.nz/infoshare/

United Nations Statistics Division. (2010). *COMTRADE Database*. Retrieved from http://comtrade.un.org/pb/readmeITSY2010VolI.aspx

World Trade Organisation. (2005). *Sanitary and phytosanitary measures*. Retrieved from http://www.wto.org/English/traop_e/sps_e/sps_e.htm

Yerex, D., & Haines, W. (1983). *The kiwifruit story.* Masterton, New Zealand: Agricultural Publishing Associates.

Zespri Group Limited. (2006). *Annual Report.* (2005-2006).

Zespri New Zealand Kiwifruit. (2007). Retrieved from http://www.zespri.com

Zwart, T., & Moore, W. (1990). Marketing and Processing. In Sandrey, R., & Reynolds, R. (Eds.), *Farming without subsidies: The New Zealand experience*. Wellington, New Zealand: G.P. Books.

Table 1. Top Ten Kiwifruit Importing Countries 2009

Country	Volume(mt)
Spain	137,615
Belgium	133,193
Germany	120,104
Netherlands	65,142
Russian Federation	64,910
France	63,134
Japan	58,501
Italy	54,747
USA	53,550
United Kingdom	37,055
Top Ten Importing Countries	787,951
World	1,189,930
Top Ten (% of world imports)	**66%**

Source: UN COMTRADE Database

Table 2. Top Ten Kiwifruit Producing Countries

Rank	Country	Volume (mt)
1993 - 1995		
1	Italy	322 730
2	New Zealand	224 000
3	Chile	125 333
4	France	77 570
5	Japan	51 267
6	Greece	41 681
7	United States	38 213
8	China	23 167
9	Portugal	9 394
10	South Korea	8 787
2003 - 2005		
1	Italy	401 622
2	China	341 000
3	New Zealand	303 000
4	Chile	151 667
5	France	76 157
6	Greece	50 000
7	Japan	38 100
8	United States	28 335
9	Iran	20 333
10	South Korea	12 000
2008 – 2011		
1	China	491 667
2	Italy	429 885
3	New Zealand	385 049
4	Chile	186 667
5	Greece	79 433
6	France	66 890
7	Japan	37 467
8	Iran	30 000
9	United States	25 371
10	South Korea	15 833

Source: Anon. (2006, 2010 and 2011)

Table 3. NZ Kiwifruit Export Growth 1984 to 2009

Partner market	Increase in value (USDm)	Average annual growth (%)
Europe	248.5	8.2
Key Asian markets	286.1	11.4
United States market	15.0	4.5
Australian market	18.2	8.8
Other markets	14.2	9.6
Total	**582.0**	**8.2**

Source: Authors' analysis of Statistics NZ data

Table 4. Revealed Comparative Advantage (RCA) – Index Values for Kiwifruit

Country	RCA (2000)	RCA (2005)	RCA (2007)	RCA (2009)
New Zealand	205.8	150.9	183.3	178.2
Chile	35.3	20.4	17.3	18.7
Greece	14.1	11.4	12.1	17.4
Italy	7.5	5.5	7.0	7.8
France	1.0	0.7	0.8	0.7
Iran	1.0	23.3	N/A	N/A
Portugal	0.2	0.5	0.7	0.6
United States	0.2	0.1	0.2	0.1
China	0.0	0.0	0.0	0.0
Japan	-	0.0	0.0	0.0

Source: Data from UN COMTRADE Database. RCA values are authors' estimates

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Table 5. Kiwifruit Model Estimation Results

Dependent Variable: log (Export of Kiwifruit from NZ, 2008 USD)

Regressor	**(1)**	**(2)**	**(3)**	**(4)**
Log(Av. GDP_{ij})	1.18***			0.97***
	(4.09)			(3.12)
Log(Av. Pop_{ij})		0.69**		
		(2.68)		
Log(Av. GDP/Pop_{ij})			3.32***	1.81
			(2.87)	(1.57)
Log(Distance)	1.71***	2.02***	2.00***	1.51**
	(2.76)	(2.98)	(2.98)	(2.42)
FTA (dummy)	2.29**	2.43**	2.68**	2.19**
	(2.18)	(2.09)	(2.38)	(2.12)
Intercept	-17.53***	-12.36**	-38.88***	-31.26***
	(-3.17)	(-2.10)	(-3.33)	(-3.04)
Summary Statistics				
Adjusted r^2	0.49	0.38	0.39	0.51
n	43	43	43	43

Note: * indicates level of statistical significance. * = 10%, ** = 5%, *** = 1%.

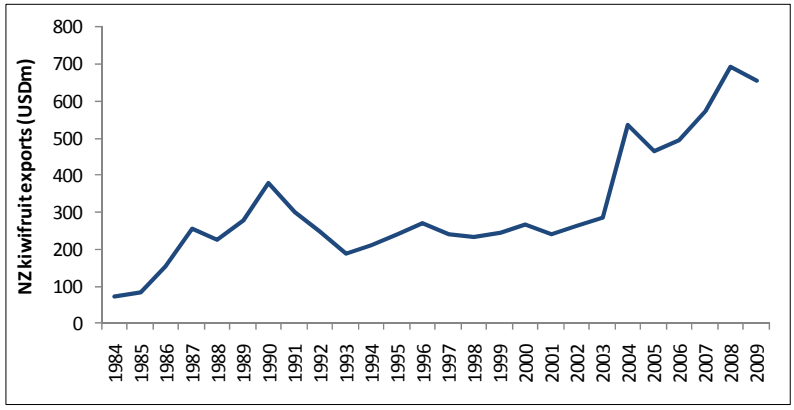

Figure 1. New Zealand Kiwifruit Exports to World

Source: Statistics NZ INFOS database

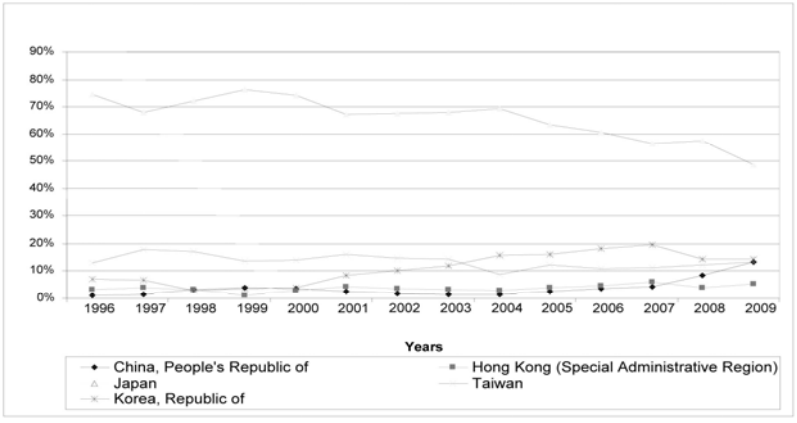

Figure 2. NZ Kiwifruit Exports to Key Asian Markets, Percent of Exports to Asia

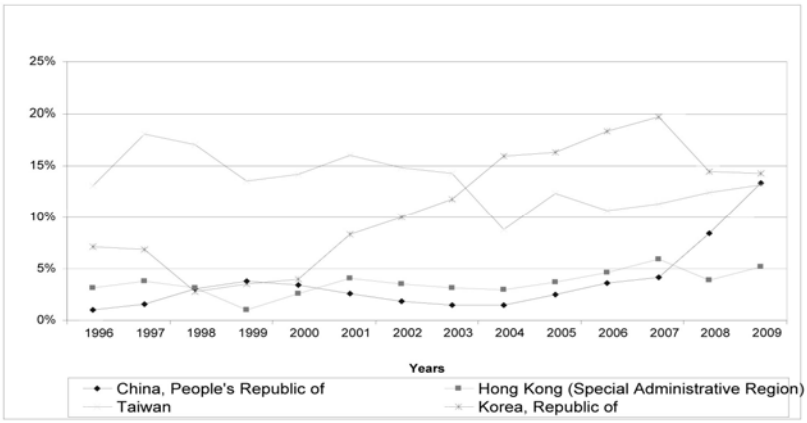

Figure 3. NZ Kiwifruit Exports to Key Asian Markets, Percent of Kiwifruit Exports

Project Finance in the Energy Industry: New Debt-based Financing Models

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Abstract

The paper aims to examine the development of new financing models for project finance to attract private investors to finance large European energy infrastructure projects. In particular, the paper investigates the uniqueness of the project finance as a rapidly growing field in finance, the financial characteristics of the project bond market as one of the vehicles for funding energy projects, and the role of the credit support provided by the European Investment Bank and the European Union to promote the bond-based financing schemes. The paper is organized as follows. Section 1 provides a general description of project finance. Section 2 identifies the economic reasons for using project finance and assesses the role of the project bond market to fund project finance in the energy industry. Section 3 evaluates the proposed financial support from the European Investment Bank and the European Union to boost the European project bond market. Final sections discuss policy implications and conclude.

Keywords: Project finance, Energy industry, Project bond, Credit enhancement

1. Introduction

Many studies have highlighted the development of energy projects is fundamental for Europe's competitiveness, productivity, long term growth, modernization, and energy supply sustainability and efficiency. Long-term investment is a vital driver for a sustainable growth, employment and financial stability. Large energy infrastructure projects require decades of revenues to amortise the high upfront investment and long-term financing schemes. It requires a long-term vision (policy-makers, regulation and financial institutions) rather than a focus on short-term results, especially on investments with significant positive externalities for growth (Khan & Parra, 2003).

According to the European Commission, by 2020 there will be considerable investment needs in European energy, transport and information and communication technology (ICT) infrastructures. The Commission estimates that by 2020 the investment needs for energy, transport and ICT infrastructures will amount to 2 trillion Euros.

The debate concerning the funding of long-term investments has grown considerably in recent years in Europe. Due to limited bank lending capacity, long-term bank lending could not be sufficient to finance energy projects in Europe. In addition, due to high public debt European countries are not able to finance large projects with public capital. Consequently, it is necessary to attract an increasing amount of private capital to finance long-term investments. In order to do so innovative financing models and new financial instruments are needed.

To increase investment in projects that promote structural change and sustainable growth, the European Commission launched the stakeholders' consultation (Europe 2020 Project Bond Initiative) on 28 February 2011. The principal idea behind the Europe 2020 Project Bond Initiative is to provide EU support to project companies issuing bonds to finance large-scale infrastructure projects. This initiative recognizes that capital markets are an alternative source of funding for energy projects. It is supported by the Commission and European Investment Bank (EIB) in order to build on existing experience with joint EU-EIB instruments and EIB's experience in EU infrastructure financing.

Project finance has proven to be a useful financing technique throughout the world and across many industry sectors (Buljevich & Park, 1999; Esty, 2004b; Fabozzi & Nevitt, 2000; Gatti, 2008). Project finance has long been used to fund large-scale energy projects (such as power generation facilities, oil and natural gas pipelines, electric utilities, chemical plants, water and waste water treatment facilities, renewable energy and green technologies, etc.) both in the developed world as well as developing countries. The percentage of capital investment worldwide that is financed on a project basis is likely to increase in the future.

Project finance may be defined as the raising of funds to finance an economically separable capital investment project in which the providers of the funds look to the cash flows from the project as the source of funds to service their loans and provide a return on equity capital invested in the project. The basic characteristic of project finance is that lenders loan money for the development of a project solely based on the specific project's risks and future cash flows. This highlights a key feature of project finance due to the capacity to generate cash flows to ensure the repayment of loans and adequate returns on equity capital. A revenue stream from the project large enough is a prerequisite for project financing.

Project finance should be distinguished from conventional direct finance. In the direct finance model, lenders look to the firm's entire asset portfolio to generate the cash flow to service their loans. In the project finance model, lenders look to the single project as a distinct legal entity. The main difference between corporate finance and project finance is that the assets are financed as stand-alone entities rather than as part of a corporate balance sheet. The project must be able to generate sufficient funds to cover all operating costs and debt service while still providing an acceptable return on the equity invested in the project. Project finance depends on a detailed evaluation of a project's construction, operating and revenue risks, and their allocation between investors, lenders, and other parties through contractual and other arrangements.

The development of new financing models for project finance is likely to attract private sector investor to finance large European energy infrastructure projects in a difficult public financial context. Innovative financing techniques are offering more financing options in the energy industry. The project bond could be a useful long-term financial instrument to mobilise the necessary financing to meet EU's strategic energy infrastructure needs. Nevertheless, it will depend on the exact characteristics of the projects and the corresponding project bonds.

2. The Financial Structure of Project Finance in the Energy Industry: Bank Loan Market vs. Bond Market

Project finance is a useful technique for financing large projects that can be organized as a stand alone company. It is an appropriate method of long-term financing for capital-intensive industries where the investment financed has a relatively predictable cash flow. A special purpose legal entity (project company) is a purely private company in which private investors bear the entire investment risk or a public-private company in which public and private partners share the investment risk (public-private partnerships). Project finance involves both an investment decision and a financing decision. One of the key structural features that characterize project finance is the distinction between the asset (the project) and the financing structure. The project company lies at the center of all the contractual and financial relationships in project finance scheme. Project financing arrangements involve many contractual relationships among multiple parties. Project finance builds on the set of numerous contracts that define the business and financial relationships:

- Supply contracts: they ensure adequate sources of supply;

- Construction contracts: they define the terms on which a qualified contractor will build the project facilities;

- Financial contracts: to raise debt and equity to finance the project;

- Operating contracts: to govern the day-to-day operation of the project company.

Project finance is an innovative model of financing projects. Its unique structural attributes provide valuable insights to identify the primary motivations for using project finance:

- *Cash flow-based financing*

financing decisions are based on the cash flows that the project is expected to generate;

- *Off-balance-sheet financing*

The project finance allows investors to keep debt off the balance sheet. It involves the use of a special purpose vehicle (SPV) to isolate assets in a separate entity and fund a project with only limited recourse to the assets of external investors;

- *High leverage financing*

For equity investors, the appeal of project finance is that it can maximize equity returns. In project finance it is possible to achieve much higher leverage ratios than sponsors could otherwise sustain on their own balance sheets;

- *Large project financing*

Investors make use of project finance to fund projects that may be too large for one investor to undertake on its corporate balance sheet;

- *Long-term financing*

On average project finance loans have a longer term than corporate loans.

The growing use of project finance challenges the Modigliani and Miller's "irrelevance proposition", the idea that corporate financing decisions do not affect firm value under certain conditions (Esty, 2004a). Project finance is an innovative financing vehicle and it offers an important example to illustrate that financing and investment decisions are not separable and independent activities. Financing structure matters. They are value relevant and financing decisions affect investment decisions.

The project finance has two sources of funds: debt and equity. Debt is provides by lenders and equity is provided by investors in the project. The traditional debt-based financing model is the bank loan. It is the traditional way to raise long-term funding for long-term projects. Debt capital is provided by large financial institutions (traditionally commercial banks), including international banks. Banks are the largest providers of debt project finance. It shows the importance of banking relationships in the project finance market. The need to raise capital, typically from banks, makes it significantly more difficult to finance projects with negative net-present-value. Convincing bankers to provide a large portion of the capital is an important constraint. Banks specifically focus on the ability of the project to make loan repayments. Banks may finance project companies directly or indirectly, through participation in syndicated loans. The latter are originally arranged and underwritten by large banks and then usually offered to domestic banks as sub-underwriters. Generally, large deals tend to be syndicated (Kleimeier & Megginson, 2000). In large projects, several banks are usually involved as financial advisers and lead managers, who will underwrite the debt and place it in the capital market. They normally divide responsibilities for various aspects of the project finance structure. Project bank loans have been concentrated in USA, Europe, Middle East, and Africa, where most of the large projects have been located. They have also been concentrated in the power industries, oil and gas, and the transportation industry, where most of the large projects have taken place.

Equity is the second source of capital to finance large projects. Typically the project sponsors provide the greatest proportion of initial project equity. Outside equity investors, usually financial institutions (commercial banks, investment funds specializing in project finance equity, equity vehicles), may invest equity in a project. Venture capital and private equity investors also serve as attractive sources for capital raising, as an increasing number of funds are investing in renewable energy and green technologies to diversify their portfolios. The size of cash distribution to equity investors is not specified contractually. It depends on the profitability of the project and the expected residual value of the project. Equity investors receive cash distribution after paying debt service. A reasonable return on equity investment is necessary to involve equity investors in the project. The return required by equity investors also varies depending on when they come into the project. Any project has different levels of risk over time and investors get into projects at different stages and with different investment strategies. Equity investors have a level of return on equity above which an investment is acceptable, and below which it is not. It depends on the cost of capital, the type of the project, the technology, the risks, the security package, etc.

The mix of debt and equity funding sources has changed during the last years as the capital market for project bonds has grown. A new debt-based financing model is the issue of bonds. Private (or public-private) project companies issue bonds (*project bonds*) on capital markets to finance projects in the energy industry. Project bonds are private debt. They are issued by project companies and not by European member states or the EU. Issuing bonds would expand the access to a broader capital market and long-term funding. The investor base can be expanded from bank loans to capital market by project bonds. Bond-based financing model aims mainly at the non-banking market and takes the form of a tradable financial instrument. Project bonds are issued with the intervention of investment banks. Project bonds may be public issues (they are placed with bond investors through the stock exchange) or private placement (they are placed with a limited number of bond investors). The evolution of project bonds is benchmarked against the more established fixed income markets in terms of pricing as well as legal structures and covenant provisions (Dailami and Hauswald, 2003; John & John, 1991).

The typical project has 70% to 75% debt and 25% to 30% equity. Banks provide 2/3 of the debt, and the bonds or multilateral development agencies provide the rest of the debt. Annual project bond issuance has grown steadily since 1992. The project bond market is concentrated in United States. It accounts for more than half of the global issuance of project bond in the world. The investment banks most active in placing project bonds are also mainly US-based. From the industry sector point of view, the project bond market is concentrated in the power projects, oil and gas projects, and infrastructure concessions.

There is no universal rule for choosing specific financing options in the project finance. Various factors affect the choice of using bank loans or project bonds (or a combination of the two) for financing projects. Bank loans can be provided to any credit worthy market, but bonds may be available only in certain markets (typically developed markets). Bonds generally offer a longer term of repayment compared to bank loans. Bank loans and bonds

generally offer fixed rates of interest. In some markets it is possible to issue bonds with the interest rate linked to the rate of inflation, if the project's revenues are linked to inflation. On the contrary, inflation-linked bank loans may be not available. Bank loans tend to maintain long-term policies towards project, while bonds can be more affected by investors' short-term attitude. Bank loans keep confidentiality in lending relationship, while bond markets need transparency. The terms of the project may have to be published in a bond prospectus. Banks loans imply low disclosure requirements, while bonds need public listing and high disclosure requirements. Bond investors have to face a higher level of information asymmetry than banks. In relationship lending banks may impose tight controls on the project company and do an effective monitoring of the credit positions. Bank loans may have a more flexible financing structure than project bonds (in terms of flexible repayment schedule, interest rate based on the performance of the project, flexible cash retention requirements, less restrictive covenants, etc.) (note 1). Bank loans are quick to deliver, while bonds need to involve third parties. If the project gets into difficulty, negotiations with banks could be kept confidential, while negotiations with bond holders may be publicized and less flexible. To refinance debt capital is easy for bank debt, but it is difficult for bonds. Bond-based financing methods imply higher transaction costs than bank loans.

Several factors influence the breadth of the project bond market for financing a project in the energy industry:

a. Project Eligibility for the Bond Market

An important financial characteristic of a suitable project is stable and strong cash flows. There is uncertainty as to the expected cash flows, which makes the investment risky. This is particularly evident in the energy industry where large projects are usually risky because of their size, the application of innovative production technologies, the amount of capital, the complex contractual relationships among various parties, the required financial and legal expertise and assistance. Projects usually undergo two main phases (construction and operation) characterised by quite different risks and cash flows. Most of the capital expenditures are typically concentrated in the initial construction phase, and most of the revenues are concentrated in the operation phase.

Investors will buy project bonds if projects are based on a sustainable financing model. Long-term lenders look solely to the project's cash flow for their repayment. A project cannot be financed on a project basis unless it is expected to be profitable. Investment decisions are influenced by the attractiveness of the rate of return offered by a project in relation to the expected rate of return of other projects and alternative comparable investments. Lenders make lending decisions based on their estimation of both the risks and returns of a project. The analysis involves assessing each type of risk and the means to mitigate its impact on the project. Assessing the returns involves verifying the cost and revenue projections. The higher the expected risk associated with a project, the higher the amount of equity the lenders will require in a project. In other words, the financing structure of the project reflects the characteristics of the assets and the contractual agreements (in terms of cash flows) from input suppliers to output buyers. Consequently, projects with long-term maturities and low risks are very suitable for debt capital markets. On the contrary, high risky projects are not that suitable.

The economic viability of a project is determined by the discounted cash flow analysis. It takes into account the timing of the cash inflows and outflows. Projecting the cash outflows and inflows is a critical part of the analysis. The outflows and inflows can be easy or really difficult to predict. It depends on the existence of purchase agreements that define contractually the price for each input and output, the price stability and the purchasing power of the currency, the complexity and innovative technology that is involved during the construction and operation period, the production capacity of the project, the riskiness of the project, and so on. The assumptions to estimate the project's cash flows are a crucial factor for the credibility and meaningfulness of project's financial statements. The cash flow projections indicate the expected profitability of the project and the expected cash flows that will be allocated among the providers of capital (debt and equity). This explains why lenders and equity investors are particularly interested in knowing the cash flow projection assumptions. An adequate financial model is an essential tool for financial evaluation of the project (Wynant, 1980).

b. Credit Standing of the Project Entity

The credit standing of the project bonds is a crucial factor for the success of the bond market. The rating is important for bond issuers because facilitate borrowers' access to global capital markets. The ability of certain investors to buy project bonds will be affected by the rating assigned the project bonds by the major rating agencies. It is important for bond investors because it offers a perspective on credit risk anchored on complex methodologies for risk analysis, and a well-understood categorisation of credit quality across debt sectors and regions. Bond investors are not directly involved in the due-diligence process and project evaluation to the extent that bank lenders, investment banks and financial advisers do, and rely on the rating issued by rating agencies. The rating of the project bonds aims to fill up an information gap (information asymmetry) between informed-insider players and

uninformed-outsider players in the project finance structure. Project finance is affected by an incomplete information market where bond issuers (project companies) have information that investors do not have (Myers and Majluf, 1984). The rating provides a measure of project bonds' default risk. If project bonds are not rated, investors may make very conservative assumptions about the default risk involved in the project and demand a higher interest rate. The credit standing of the project bonds affects the rate of interest lenders are willing to accept. In addition, most institutional investors, who represent the potential source of long-term funds for a project financing, invest in securities that are rated "investment-grade". This is due to corporate investment policy, risk management guidelines, or regulation.

The rating agencies can translate the available financial information into an assessment of the sponsor's credit risk exposure related to the project finance. Investors can incorporate their assessments into the prices they are willing to pay for each sponsor's outstanding securities. Rating agencies help control principal-agent conflicts because they review the economics of the project, review the contracts, and assess the appropriateness of the project's capital structure. Rating agencies also review the credit standing of the project bonds. However, the complexity of the credit risk analysis increases with the complexity of security packages involved in project financing.

c. *Project Financial Leverage*

The project company uses the revenues to repay the debt and equity capital. The project company has to match the value of long-dated assets with its long-dated liabilities. Lenders require sufficient equity to make the project creditworthy. In finance theory, an equity investor in a firm with high financial leverage would expect a higher return than one in a firm with low leverage. However, in project finance it is different, since its high leverage does not imply high risk (Beidleman, Fletcher, & Veshosky, 1990; Yescombe, 2002). The project company can achieve high financial leverage ratios (debt-to-assets). Project finance is usually designed to achieve high initial financial leverage. Fabozzi & Nevitt (2000) claim that, "project financing can sometimes be used to improve the return on the capital invested in a project by leveraging the investment to a greater extent than would be possible in a straight commercial financing of the project." A high level of debt is the essence of project finance. However, the projects do not maintain the same leverage ratios throughout the life of the project. As a project starts to generate positive operating cash flow, the loan covenants may require that project cash be used to reduce debt. Esty (2002, 2003) recognises, however, that higher leverage increases expected equity returns, but higher leverage also increases equity risk and expected distress costs.

The amount of leverage a project can achieve (or the level of debt that can be raised) depends on the project's profitability (the greater the level of income that can be contractually assured, the greater the amount of debt a project can support), the nature and extent of risks, the cash flow characteristics, the lenders' cash flow cover requirements, the lenders' views on the debt-equity ratio for particular types of projects, the extent of credit support mechanism, the loan parameters (interest rate, maturity, loan amortization), the security arrangements, the creditworthiness of the parties involved, and the industrial sector to which the project belongs. The terms of the debt and equity are tailored to the characteristics of the project. High leverage in project finance improves the return on equity because it takes advantage of the fact that debt is cheaper than equity (Shah & Thakor, 1987). Lenders are willing to accept a lower return (for their lower risk) than an equity investor. In addition, tax benefits may make high leverage more attractive because interest is tax deductible, whereas dividends are not (Yescombe, 2002). To assess the projected ability to service debt (interest payments and principal repayments), lenders calculate margins of safety or coverage ratios (note 2).

d. Liquidity of Project Bond Market

The bond market is typically restricted to banks and institutional investors (pension funds, infrastructure funds, insurance companies) who are willing to do long-term investments. The lack of a bond market infrastructure, and a secondary market for pricing and liquidity reduces the attractiveness of the investment for some investors and require higher interest rates. But this problem is not as great as it at first appears because many project bonds are placed on a private basis (private placement), to investors who do not intend to trade them in the market (Yescombe, 2002). In addition, investment banks may maintain a liquid market by trading in the project bond.

e. Investors' Attitude to Finance Long-Term Project in the Energy Industry

Issuing bonds has to take into account two major problems: risks involved and the long-term nature of the project. Investing in energy projects requires a long-term perspective, due to the time horizon of projects realization. Such projects usually express their potential returns only after several years. Energy infrastructure projects seem good long-term assets with high public importance (Brealey, Cooper, & Habib, 1996). Large long-term institutional investors (in particular insurance companies and pension funds) are potential buyers of financial instruments for initiatives in project financing. They may represent huge players in financing energy investments. Long-term

investors are characterized by a low reliance on short-term market liquidity, due to stable resources. They require a good long-term fixed-rate return without taking equity risk. The main characteristics of long-term investors should be: the ability to retain assets longer than other market players; the ability to invest in assets that yield a profitable return in the long-run; the availability of long-term liabilities in the balance sheet.

f. Project Size

The bond market represents an efficient means of financing a large project because of the high transaction costs and scale economies. Financing energy projects with project bonds may be a successful strategy when the project is large and capable of standing alone as an independent economic unit. Structuring and issuing bond projects involves high costs of transactions: costs of screening, evaluating, selection and monitoring the project, costs of obtaining information, costs of determining and implementing the financial arrangements, costs of organizing the placement (private or public) of bond issues in the capital markets with institutional investors, costs of monitoring and controlling the bond issuer, costs of providing information to capital markets. Project bond-based financing structure requires significantly high transaction costs, that result also from capital market imperfections (agency conflicts, asymmetric information, bounded rationality, opportunistic behavior, etc.). The higher the transaction costs the higher the size of the project to be profitable and financially suitable for the bond markets. The biggest drawback of bond-based financing is that it is considered inefficient for small transactions. Consequently, project bonds tend to involve large projects.

3. Funding Project Finance in the Energy Industry: The Project Bond Market and the Credit Support Provided by the European Investment Bank (EIB) and the European Union (EU)

The financing of large-scale projects through bank debts has become more difficult because since the financial crisis, the capital and liquidity requirements for commercial banks have become much stricter. Basel 2 and 3 have put pressures on banks' balance sheets (Basel 2 and 3 impact on bank lending), while public budgets remain constrained. The tighter capital standards that are imposed on commercial banks have significantly reduced the available long term funding for projects in the energy industry. In addition, legal lending constraints with regard to loans to a single borrower and risk management guidelines can limit the availability of long-term funds to finance large projects in the energy industry. The latter can incentive banks to finance large projects through loan syndication.

The banking sector will not be able to provide alone the amounts of debt that are required by large-scale energy projects. There is the need to find ways to mobilise private sector investors, without increasing direct public funding and public indebtedness. Identifying alternative long-term debt sources is critical in terms of available amounts for energy projects. With the "Europe 2020 Project Bond Initiative" the European Commission promotes credit support (payment guarantees or credits) provided by the European Investment Bank. The European financial support aims to assure long-term financing for European infrastructures against the background of increasingly limited public funding, and growing constraints on long term bank lending. The European initiative does not aim at substituting bank financing, but at ensuring compatibility.

The proposed financial support from the European Investment Bank and the European Union could take the form of a debt service guarantee or an additional layer of debt at the subordinated level. The debt service guarantee could be in the form of a contingent credit line provided to the project entity by the European Investment Bank (or another financing partner), which would inject funds into the special entity if the project were unable to generate sufficient cash in the short to medium term to service its debt for any reason (figure 1). In details, the project company issues project bonds on the capital market to finance an infrastructure project. Private investors (usually institutional investors) buy the project bonds. The project company repays the bond from its current revenues. The guarantee enters into force if and when the bond cannot be serviced from the current revenues "for any reason" (European Commission, 2011). In this case, the holders of the bond concerned are serviced by the European Investment Bank guarantee payments to the maximum of the previously determined guarantee sum.

Rather than issuing a permanent guarantee, the European Investment Bank can also issue a credit to the project company to the maximum amount of 20% of the investment sum (figure 2). The European Investment Bank's credit is an alternative to payment guarantees. A project company (special entity) would divide (tranche) its debt into two layers: a senior portion (project bond) to be placed with institutional investors, and a subordinated debt obligation, which would be underwritten by the European Investment Bank.

As described above, European Investment Bank and the European Commission support the development of project bonds, by providing credit enhancement facilities. The European Commission promotes payment guarantees (or credits) to be issued by the European Investment Bank. The European Commission sets eligibility conditions for those projects benefiting from "Project Bond Guarantee Facility". As stated in the consultation paper (European Commission, 2011), "they should be economically and technically sound and cost-effective, have stable and strong

cash flows and have a real prospect of financial viability". The European Union needs to assess by itself the risks and financial viability of such projects.

The European Investment Bank's intervention will enhance the credit quality of the senior bonds, thus making these bonds eligible for the portfolios of institutional investors. The European Investment Bank will then partially transfer the credit risks taken on the subordinated bond on to the EU via appropriate risk sharing mechanisms. The European Union will support the "Project Bond Initiative" via risk sharing mechanisms with the European Investment Bank. Public payment guarantees or credits encourage the participation of private investors in energy industry through improved ratings. Most energy projects (particularly in the renewable energy sector) have high up-front capital costs relative to competing technologies and low rates of return. These features limit the private investors' attitude to finance high risk and low return investments. The credit enhancement is a powerful instrument to boost appetite on project bonds. It can motivate banks and bond investors to lend for projects they perceive as risky. Both forms of credit enhancement (public guarantees and credits) can lead to upgrade the rating of the project. This facility is a key element in securing an investment grade rating for the project bond. This promotes insurance companies, pension funds, and infrastructure funds, to buy project bonds. The law prescribes them minimum requirements related to the rating of individual projects. On the one hand, a low credit standing of the project bonds may preclude institutional investors from purchasing bonds of a particular project. On the other hand, the investment-grade rating of the project bonds (AAA) is eligible to most institutional investors. By upgrading a rating to "investment-grade", public guarantees (or credits) can promote the subscription of project bonds and thus encourage the participation of private investors. The enhancement of the credit rating of project bonds increases the attractiveness of long-term investment to private sector participants.

The acquisition of project bonds bears a high risk for private investors. The certain high investment costs are faced with uncertain current revenues. The risk is reduced if a part of the current revenues is insured by payment guarantees. This leads to an improved rating of project bonds and gives the chance to raise funds in the bond market at low interest rates (reducing borrowing costs). The need for credit enhancement will depend on the characteristics, risks and opportunities of each project as well as on the financial situation of the project company. The credit enhancement will be useful to both accelerate financial close of bankable projects, and to make bankable other projects.

The proposed European financial support for the development of the project bond market gives the European Union and the European Investment Bank a particular role:

- The European Investment Bank will help develop a pipeline of private-public partnership projects on the basis of a clearly defined eligibility framework. The European Investment Bank should assess the project pipeline in order to identify potential candidates for project bonds;

- The European Investment Bank will carry out the due diligence and financial appraisal in the structuring phase, price the guarantee or loan and monitor the project. The European Investment Bank will assess in detail all projects to determine the robustness of their financing structure, as it has the appropriate expertise. Potential investors may not have the expertise to appraise projects and carry out the analytical and administrative evaluation;

- The European Union and the European Investment Bank would share the risk of the losses of the project portfolio. The maximum amount of the default risk borne by the European Union is limited to the reserves of the EU financial framework, retained especially for such cases;

- The European Investment Bank will be the controlling creditor (bond creditors' representative): it takes responsibility for monitoring the project implementation and negotiates with the project company on behalf of all bondholders in case of need.

The credit support provided by the European Investment Bank will likely promote the bond-based financing structure in the project finance market. It will create an asset class attractive to investors and help raise capital to finance long-term investments and large scale energy projects that contribute to lung-run economic growth. Nevertheless, many microeconomic and macroeconomic issues are on the ground. There is a strong interaction between financial regulation and economic effects of new debt-based funding models in project finance. Stricter bank capital regulations forced many banks to reduce the availability of bank funding for large projects. The impact of Basel 3 is likely to be negative, particularly in Europe. It will have a huge impact on bank lending. It may reduce liquidity to invest in the project finance sector. As a result of the subprime lending crisis and the resulting credit crunch, and as a consequence of the debt crisis of many EU States, project bonds could become more attractive to private investors since payment defaults can no longer be excluded for sovereign bonds. The development of a project bond market has a positive impact on public debt sustainability.

In this perspective of analysis, a key question could be how to structure project bonds in order to attract demand from long-term investors. In order to be a successful financial instrument, the project bond should gather the following characteristics:

1. Attracting high quality sponsors: project bonds represent a financing alternative and offer liquidity although it must compete with traditional bank loans;

2. Attracting credit enhancement tools to produce the required ratings suitable for bond investor demand. A strong investment-grade credit rating of the project bonds might be the way to convince long-term investors to participate in large energy projects;

3. Involving institutional investors to match long-term liabilities with long-term projects: investment-grade rating grants the access of institutional investors;

4. Involving high quality projects: well structured projects with high quality cash flows and financial robustness allow to achieve investment grade rating. The repayment of project debt is totally dependent upon project cash flows;

5. Involving an independent asset manager to provide monitoring, surveillance and reporting to bond investors;

6. Involving best practices in financial engineering that may be used to enhance project attractiveness to potential investors and develop multiple financing structures to attract various investors to projects (note 3).

More broadly, the above analyses highlight the fact that the effectiveness of project bonds, as financial instruments, is strictly related not only to the efficiency and well-functioning of the primary capital market but also to the secondary one. Based on this point, some policy implications can be suggested for the development of a bond-based financing structure in the energy industry:

- Creating a capital market infrastructure for the European project bonds (placement, listing, trading, and settlement procedures). The European Investment Bank may create a trading platform to improve liquidity and pricing, provide liquidity in the project bond market, provide a facility to purchase unsold project bonds (these could then subsequently be sold in the financial market);

- Encouraging private investments by providing a supportive investor regulation. A new regulatory framework, more friendly with long-term investments, should involve accounting standards, prudential principles, corporate governance, and fiscal incentives (note 4);

- Encouraging expertise to manage complex project finance transactions. In a pilot phase, it may be useful to undertake economic and financial analyses in order to collect good practices, exchange knowledge and methodological supports;

- Evaluating the potential effects of the new banking regulation (Basel 3) on project bond market (possible distortions are due to the treatment of project debt in capital requirement measures).

- Promoting the creation of an international special purpose vehicle (SPV) to issue project bonds for cross-border energy projects;

- Promoting the harmonization of national regulation and legal frameworks that help structure different financial schemes of project bonds and develop innovative financial instruments tailored to the energy sector;

- Providing information on the opportunities in investing in project bonds related to projects in the energy industry;

- Building effective financing partnerships with the private sector. Most energy projects, renewable energy projects in particular, rely on government and public funding.

Nevertheless, as a final point, it is worth noting that some aspects of the “Europe 2020 project bond initiative” may raise critical issues:

1. The availability of the guarantee facility is related to European Investment Bank’s assessment criteria. Underlying projects need to satisfy EIB’s assessment criteria (projects must be technically robust and financially sound);

2. The credit enhancement can be used only for some energy projects (selected by the European Investment Bank). This affects the bankable projects and the possibilities to raise private capital in the debt capital market. Is also creates a possible distortion of competition among bond issuers;

3. The European Investment Bank may involve bureaucratic procedures to assess projects which could be time consuming;

4. The role of European Investment Bank's controlling creditor may be controversial. Bond investors will likely not accept the European Investment Bank acting as sole controlling creditor. In addition, bond investors may require voting rights with regard to "events of default".

In brief, the European Investment Bank could become an "enabler" to promote the development of the project bond market and encourage private-sector participation in the financing of energy projects. The European Investment Bank will screen, assess, mitigate and monitor project risk as an experienced player, and will provide guarantees/sub-debt to obtain ratings uplift.

4. Conclusion

The paper highlights several important characteristics of the project bond market. The project bond, as an innovative financial instrument, is a useful tool by helping to bring private and public funds together to finance projects of major public interest. Project bonds can attract capital market financing for long-term energy infrastructure projects. Project finance is likely to be increasingly important in the future as European countries rely on it to develop their energy infrastructures. It can provide funding for investments in the energy industry that the public sector might not be able to undertake.

For the near future we can expect the development of expertise, lending and private placement capabilities to lower size threshold to access bond market to fund projects in the energy industry. The exchange of best practices between European countries would be very helpful in this field. There is also increasing investors' interest in debt funds investing in energy infrastructures. New funding structures will be developed to meet the needs of the project finance market and balance the needs of investors with the needs of the public sector.

References

Bassanini, F., & Reviglio, E. (2011). Financial Stability, Fiscal Consolidation and Long-term Investment after the Crisis. *OECD Journal: Financial Market Trends*. 21 (1). http://dx.doi.org/10.1787/fmt-2011-5kg55qw1vbjl.

Beidleman, C. R., Fletcher, D., & Veshosky, D. (1990). On allocating risk: the essence of project finance. *Sloan Management Review*, 31 (3).

Brealey, R. A., Cooper, I. A., & Habib, M. A. (1996). Using Project Finance to Fund Infrastructure Investments. *Journal of Applied Corporate Finance*, 9. http://dx.doi.org/10.1111/j.1745-6622.1996.tb00296.x.

Buljevich, E. C., & Park, Y. S. (1999). *Project Financing and the International Financial Markets*. Norwell, MA: Kluwer Academic Publishers.

Dailami, M., & Hauswald, R. (2003). The Emerging Project Bond Market: Covenant Provisions and Credit Spreads. *World Bank Policy Research*, Working Paper n. 3095.

Esty, B. C. (2004a). Why Study Large Projects? An Introduction to Research in Project Finance. *European Financial Management*, 10. http://dx.doi.org/10.1111/j.1354-7798.2004.00247.x.

Esty, B. C. (2004b). *Modern Project Finance: A Casebook*, New Jersey: John Wiley & Sons.

Esty, B. C. (2003). *The Economic Motivations for Using Project Finance*, Harvard Business School, Working Paper.

Esty, B. C. (2002). Returns on Project-Financed Investments: Evolution and Managerial Implications. *Journal of Applied Corporate Finance,* 15. http://dx.doi.org/10.1111/j.1745-6622.2002.tb00342.x.

European Commission. (2011). *Europe 2020 Project Bond Initiative*, February.

Fabozzi, F., & Nevitt, P. (2000). *Project Financing*, London: Euromoney Books.

Farrell, L. M. (2003). Principal-agency risk in project finance. *International Journal of Project Management*, 21. http://dx.doi.org/10.1016/S0263-7863(02)00086-8.

Finnerty, J. D. (2007). *Project Financing. Asset-Based Financial Engineering*, New Jersey: John Wiley & Sons.

Gatti, S. (2008). *Project Finance in Theory and Practice*. Burlington Academic: Press.

John, T. A., & John, K. (1991). Optimality of Project Financing: Theory and Empirical Implications in Finance and Accounting. *Review of Quantitative Finance and Accounting*, 1. http://dx.doi.org/10.1007/BF02408406.

Khan, M. F. K., & Parra, R. J. (2003). *Financing Large Projects*: Using Project Finance Techniques and Practises. Essex: Pearson Education.

Kleimeier, S., & Megginson, L. W. (2000). Are project finance loans different from other syndicated credits?. *Journal of Applied Corporate Finance*, 12. http://dx.doi.org/10.1111/j.1745-6622.2000.tb00043.x.

Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have, *Journal of Financial Economics*. 13. http://dx.doi.org/10.1016/0304-405X(84)90023-0.

Shah, S., & Thakor, A. V. (1987). Optimal Capital Structure and Project Financing. *Journal of Economic of Theory*, 42. http://dx.doi.org/10.1016/0022-0531(87)90086-X.

Yescombe, E. R. (2002). *Principles of Project Finance*, San Diego: Academic Press.

Wynant, L. (1980). Essential Elements of Project Financing. *Harvard Business Review*, 58 (3).

Notes

Note 1. Covenant provisions contained in bond typically take the form of restrictions on dividend, M&A transactions, and asset disposals, limitations on indebtedness, requirements of third party guarantees, maintenance of good regulatory standing and, in certain circumstances, the establishment of offshore and debt service reserve accounts (Dailami & Hauswald, 2003, p. 8).

Note 2. The main ratios to measure project capacity to face debt obligations are: *Debt Service Coverage Ratio* (DSCR) = Cash Flow available for debt service/Debt service (principal, interest and commissions); *Interest Coverage Ratio* (ICR) = Cash Flow available for debt service/Interest; *Loan Life Coverage Ratio* (LLCR) = NPV of Cash Flows available for debt service (during debt) discounted at debt rate/Outstanding debt.

Note 3. For example, aggregating several project finance deals in one portfolio (to diversify risks) and issuing project-based bonds. In this way, investors may insure themselves against possible payment defaults distributing their private capital among various projects. Nevertheless, the diversification of the portfolio of projects is not always possible because in different sectors (such as transport, energy and communications) there might be high correlations.

Note 4. The mark-to-market accounting rule is particularly damaging for long term investments, attributing instant market values to assets the value of which is based on a long-term perspective. Accounting frameworks should encourage long-term investments with positive effects for financial market stability. See Bassanini & Reviglio (2011).

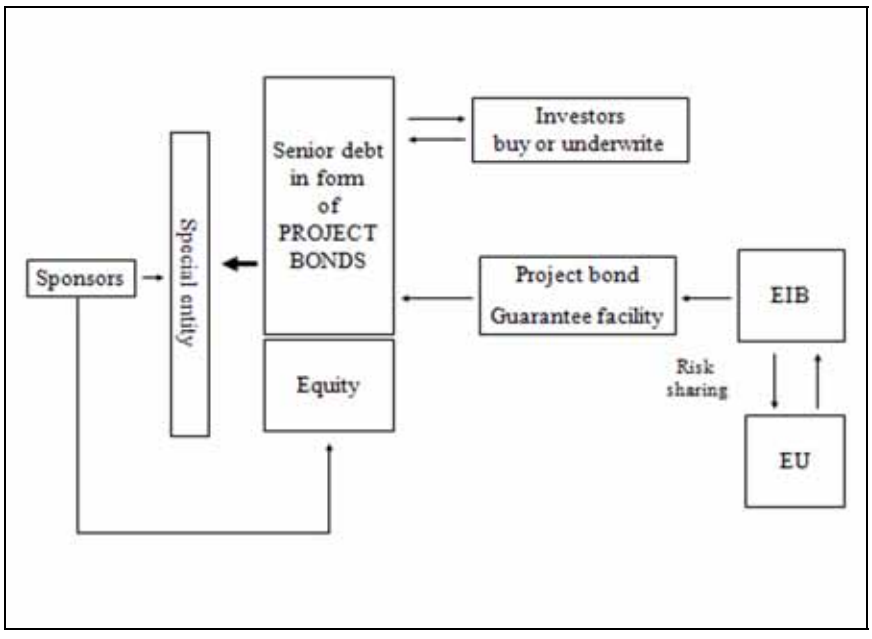

Figure 1. The European Financial Guarantee

Project finance: bond-based financing model and European financial facility (guarantee). The EIB grants a payment guarantee covering the entire term of the project bond.

Source: European Commission (2011).

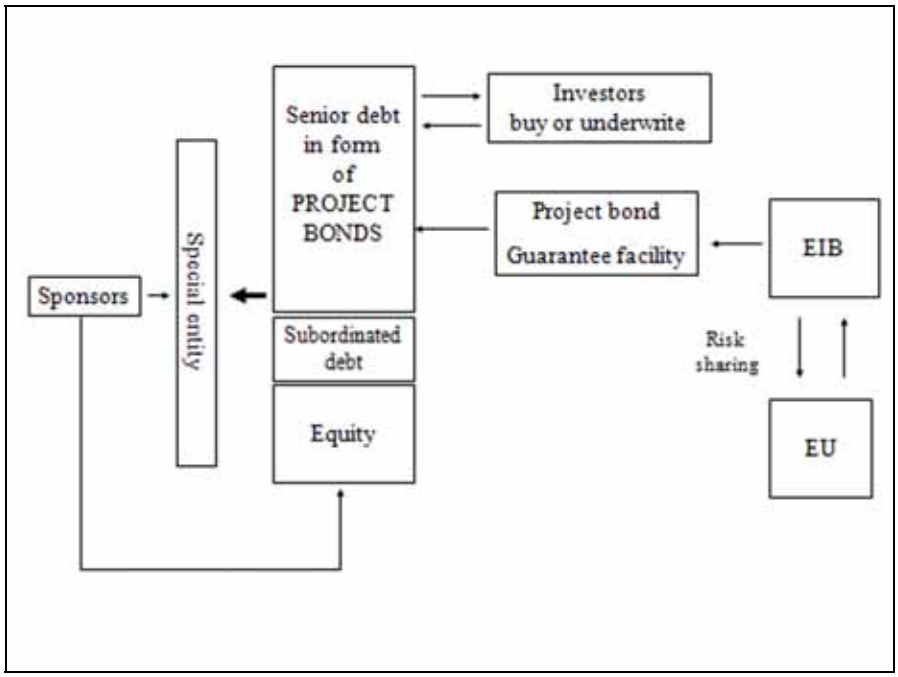

Figure 2. The European Subordinated Debt

Project finance: bond-based financing model and European financial facility (subordinated debt). The EIB issues a credit to the project company. Source: European Commission (2011).

Towards Spiritual Entrepreneurship Inecotourism in Southern Africa

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Abstract

The article sheds light on how ecotourism can be organized in Southern Africa using newer business models as the point of reference. Using chaos theory, the resource based view and dynamic competencies as theoretical basis, the article illustrates how firms within ecotourism can find new ways of organizingas means to become more competitive given a more dynamic and turbulent business environment. We build an innovation model illustrating how it is possible to use radical steps in marketing using spiritual ecotourism in developing countries as the empirical setting. Our methodological position is within the postmodern perspective. It also incorporates elements from the interpretive perspective.

Keywords: Southern Africa, Developing economics, Ecotourism, Spirituality, Chaos theory, The resource point of view, Dynamic capabilities

1. Problem Definition

We ask: How is it possible to support ecotourism with a focus on spiritual entrepreneurship in developing countries. We use Southern Africa as the empirical setting. In order to address the research question we draw on three complementary theoretical lenses: chaos theory, the resource-based view, and dynamic capabilities.

2. Ecotourism in Southern Africa

Africa is the fastest growing region for international tourism, now the world's largest growth industry, with few signs of slowing down. During the last few years, profound shifts have taken place in geopolitics and economic power. The rise in "south- south" trade challenges the dominance of western norms in business and politics, where transparency, governance and ethics are important issues. There should be a great need to innovate and deliver profitable products and services in developing countries. The response from the business world to these challenges may the most critical factor in determining the ability to achieve sustainable and inclusive growth in developing countries.

The economic geography of the post-industrialized world is characterized by fundamental processes of restructuring, an increased mobility of capital and a pursuit for new economic growth activities, particularly in the service sector (Binns and Nel, 2002). Traditional means of investing, conducting marketing and work within political networks have undergone dramatic changes. In recent years, the service sector has become more important worldwide, for example when it comes to consumer preferences, wealth mobility and location mobility (Hall and Page, 1999). One sector that performs well in this context is the tourism industry, which has become one of the critical forces in shaping the economy in many countries (Williams and Shaw,1998). At the same time, there is a debate on how tourism development can support community development and sustainability (Wahab and Pigram, 1997; Elliott et al., 2001).

Tourism has long been considered an effective catalyst of rural socio-economic development and regeneration. Throughout Europe tourism has been widely promoted and relied upon as means of addressing social and economic challenges facing peripheral rural areas, primarily those experiencing a decline in traditional agrarian industries (Cavaco, 1995; Hoggartet al, 1995; Williams and Shaw,1998). Rural tourism development programs have become increasingly evident elsewhere, although not to the same extent as in Europe. In the United States, for example, 30 states have developed tourism politics specifically targeting rural areas, whilst a further 14 have included rural tourism within their overall tourism plans (Luloff et al, 1994).

Southern African countries can lead the way in tourism development in Africa, particularly in ecotourism, the fastest growing sector according to WTO Ecotourism. In recognition of ecotourism's growth potential, particularly in developing countries, the UN Economic and Social Council recently declared 2002 the international year of

ecotourism. Ecotourism focuses on how to take advantage out of small-scale production. The conservation of protected areas is often highlighted. Ecotourism is viewed as both a conservation and development tool because it can provide conservation benefits and economic benefits.

Ecotourism can involve volunteering, personal growth and learning new ways to living. Such tourism typically involves travel to areas where flora, fauna, and cultural heritages are the main attractions. Ecotourism includes programs that minimize negative aspects of conventional tourism on the environment. It can enhance cultural integrity of local people. Therefore, in addition to evaluating environmental and cultural factors, an integral part of ecotourism generally focuses on improving recycling, energy and water conservation, and the creation of economic opportunities for local communities.

A main part of such tourism development is to focus at spiritual dimensions (Brooks, 2008:4). Safeguarding and transmitting the spirit of places is one of the main objectives of ICOMOS (2008), through a project initiated by UNESCO. ICOMOS (1999) regards "cultural heritage as a dynamic reference point for daily life, social growth and change. It is a major source of cultural capital and an expression of diversity and cultural identity".

3. Challenges in Ecotourism in Developing Countries with a Focus on Southern Africa

In order to attract foreign investors, firms in developing countries can lack the superior technology and supporting infrastructure that are necessary to reach global markets (Porter, 1998).Because small-to-medium sized enterprises (SMEs) are common in developing countries, entrepreneurs are plagued with scale constraints on investments in productive assets, including the use of international distribution channels (Sengerberger et al, 1990). A possible way to circumvert such scale and infrastructure limitations isto promote joint action among SMEs through interfirm agreements (Markusen, 1999; Storper, 1997; Tallman et al. 2004).

Ironically, although forging interorganizational collaborative arrangements appears to be critical for SMEs in weak infrastructure settings, it is precisely in those countries that firms also suffer from a host of institutional failures, such as poor legal systems, discretionary governmental policies and inefficient regulation, that hinder the pursuit of joint action and impose high investment uncertainty and exchange hazards (Mesquita, 2003; North, 1990). Suppose, for instance, that SMEs wish to articulate complementary competencies to overcome infrastructure shortcomings. As they invest in resources specific to their joint project and form expectations of outcomes that are difficult to meter ex ante, they may suffer severe contractual hazards (Mesquitaand Lazzarini, 2008).

In many cases the tourist industry will have to relate to situations were land and resource rights are deeply contested. The objective of land reforms in South Africa, to mention one example, is to redress the racially based land dispossessions from the apartheid years, which were characterized by inequitable distribution and ownership over land. Restitution politics aim to restore land and provide other remedies to people dispossessed by radically discriminatory legislation and practice. Policies and procedures are based on the Bill of Rights and the Restitution of Land Rights of 1994 (Department of Land Affairs, 1997). However, implementing land reforms has not been completed as rapidly as many would have wished. Tensions and disputes over land rights are common, going back to the colonial years when chiefs and headmen formed an integrated part of the colonial system (Cousins and Classens, 2003).

European investors can benefit from paying increased attention to distribution ofland and the importance of building local institutions when considering Southern Africa as regions for foreign investments.There are examples where efforts in ecotourism has not worked out as expected. Ecotourism in Wild Coast at the Eastern Cape Province (South Africa)was a failure due to conflicts between villages over the ownership and the use of land. The villages have been engaged in a number of power plays and entered into complex and shifting relationships at different moments of time, ranging from alliances and collaboration at one end of the spectrum to outright hostility and confrontation at the other. Since the beginning of the 90s the political terrain has become steadily more complex and turbulent (Cousins and Classsens, 2003).

4. Methodological Foundations

We did intensive research on secondarily sources such as public registers and academic articles. We tried to create a meaning out of the data in the research process. We mostly used qualitative methodologies as techniques as these have been associated with descriptive and case study research.

Our methodological position is within the postmodern perspective. It also incorporates elements from the interpretive perspective.An interpretive approach is regarded as suitable for the investigation of complex and poorly understood phenomena (Dixon et al, 2007), since such an approach implies that the researcher's task is to "make sense of local actors' activities" (Soulsby and Clark, 2007, 1426). Thus the important criterion for assessing interpretive data analysis is its ability to provide reasonable insights into the phenomena that demand deeper understandings. Empirical findings illustrate, rather than validate, the theories they reflect (Astley and Zammuto, 1992).

We assume that meaning is locally created, that sudden change is a part of organizational reality, and that organizational outcomes are often a result of unintended consequences (March, 1994; Weick, 1979). The postmodern view of decision-making is often built on a decentralized framework (Lyotard, 1984; Rosenau, 1992). The methodological perspective of decentralization fits well with the realities in the current economic environment. Economic turbulence coupled with accelerating globalization, continuous improvement of technologies and deregulation of markets has a profound impact on the ability to decentralize.

As the study processed, a similar process to that outlined by Meyer et al (1993), where concepts and research methods were constantly rethought and upgraded following analysis and findings. Similarly, Hinings and Greenwood (1988, 99) argued that the researcher has to modify theoretical frameworks during the life of the project. It has been recognized that the conventional research cycle-conceptualization, design, measurement, analysis, and reporting, does not hold well in hyperturbulentmarkets (Chiaburu, 2006). In order to understand organizational phenomena at a more than superficial level, the scholarly literature has called or a more in-depth process research (Langley, 1999).

This study considers change to be a continual process of becoming, rather than a succession of stable states. This viewpoint suggests that social reality is not a steady state, but rather can be regarded as dynamic processes (Beech and Johnson, 2005). Thus, there is a need to observe events and interactions as they unfold over time. This approach suggests that dynamic construction, deconstruction and reconstruction of meaning make sense over time as contextual forces evolve and as organizational restructuring takes place.

5. The Use of Chaos Theory as a Theoretical Focus

Ecotourism in Southern Africa is new enough, chaotic enough and in the past unregulated enough so that chaos theory can be used with a certain degree of justification.Chaos theory is the study of complex, nonlinear dynamic systems. Chaos describes a situation where a system is dislodged from its steady state condition by trigging events, where outcomes just as well can lead to harmony as increased tensions. It involves regrouping of elements of a system, for which a new order eventually emerges. The dynamics of systems arise spontaneously from their internal structure. Often small random perturbations are amplified and molded by the feedback structure (Stacey et al, 2000).

The field was pioneered by Lorentz (1963) who studied the dynamics of turbulent flow in fluids. It is when a system is at a state of chaos it is most vulnerable to butterfly effects, where small causes can have large effects on a whole system. Lorentz (1963) also noted that some systems are likely to make “smoothing” adjustments so that “wild fluctuations” in the short term may be partially nullified in the long term through negative feedback mechanisms.

Chaos systems have “life-like” characteristics with an ability of self-organization (Gleick, 1987). A chaotic system can be regarded as an adhesive friction between sand grains, taxed to the limit of their tolerability. It implies a critical point where a single grain dropped on to a pile under maximum stress will cause a sudden phase shift into dramatic chaos manifested in the collapse of a face of the sand pile. Since the critical point can’t be determined with exact prediction it can be wise to have plans ready as to how to respond.

Stability is preserved by the properties of redundancy. Redundancy means that the same pattern can be produced in a number of different ways. In order worlds, there is a repetition of efforts, which is unnecessary if one thinks entirely in terms of efficiency. Parts of the process can be damaged or not succeed in producing a repetition of a particular behavior, while others practices will survive. Loose coupling has much the same result. One interaction is not dependent on a very exact way of completion of a number of other interactions (Stacey et al, 2000).

Proponents of chaos theory enthusiastically see signs of it everywhere, pointing to the ubiquity of complex, dynamic systems in the social world and the resemblance between patterns generated by simulated nonlinear systems and real time series of stock exchange or commodity prices. From a theoretical perspective, chaos theory is congruous with the postmodern paradigm, which questions deterministic positivism as it acknowledges the complexity and diversity of experience. While postmodernism has had a profound influence on many areas of social science and the humanities, chaos theory has been neglected by organization theorists until recently (Hassard and Parker, 1993).

Despite its attractions, the application of chaos theory to social sciences is still in its infancy. There are those who think that expectations are too high (Baumol and Benhabib, 1989). Although real life phenomena may resemble the patterns generated by simple nonlinear systems that do not mean that we can easily model and forecast these phenomena. It is almost impossible to take a set of data and determine the system of relationships that generates it (Butler, 1990).

6. Towards New Organizational Forms in Ecotourism in Southern Africa

Weare living in times where organization becomes organizing, we speak of the doing of organization (Shane and Venkataran, 2000). Recent research illustrates that the business landscape is neither stable nor predictable (e.g. Hamel, 2000; Muller-Stewans andLechner, 2001;;Leibold et al, 2002).In such a business environment there is a need for organizational flexibility, more create leadership practices and business models that pay increased attention to

changing customer requirements. Change and uncertainty are constant in the new economic landscape. There are great opportunities in this uncertainty as firms identify and explore business opportunities. Managers are increasingly realizing that the basis of their competitive advantage is found in their knowledge base, and that development and exploitation of knowledge is paramount for the sustainability of such advantages. Hence, better use of existing knowledge and more effective acquisition and assimilation of new knowledge becomes a business imperative.

Scholars and managers have raised serious concern about the extent to which existing approaches to strategy making can help firms in envisaging, conceiving, and realizing more imaginative strategies (Weick, 1989; Hamel, 1996; Chackravarty, 1997; Szulanski and Amin, 2001). It is therefore not a surprise that research increasingly calls for greater attention to imagination in formulating and implementing strategies(Roos and Victor, 1999; Hamel, 2000:3, von Krogh et al, 2000; Szulanski and Amin, 2001: 537).

At the same time we have witnessed a shift in the management literature from the industrial organizational perspective (Mason, 1939; Bain, 1956, 1959, Porter, 1980, 1985) towards the resource based perspective (Wernerfelt, 1984; Barney, 1991;Peteraf, 1993; Amit and Schoemaker, 1993) and finally, towards the dynamic capability perspective(Teecewt al. 1997; Zollo and Winter (2002) and Helfat and Peteraf (2003).

The industrialized organizational perspective (traditional tourism)

Building on the industrial organization framework strategic management theory and entrepreneurship research suggest that entry barriers are key industry structural characteristics that impact business performance (e.g. Hofer and Schendel, 1978; Porter, 1980). More specifically, IO theory suggests that (1) economics of scale, (2) capital requirements, and (3) product differentiation are the most important entry barriers (Bain, 1956, 1959; Caves, 1972; Hofer, 1975; Shepherd, 1975; Hofer and Schendel, 1978; Porter, 1980; Hay and Morris, 1991; Siegfried and Evans, 1994).

We are of the opinion that the industrialized organizational perspective is related to traditional ways of conducting tourism development, for example by offering package forms of tourism with tour operators playing main roles.This form of tourism mayreach a stage of saturation in Southern Africa due to low entry barriers from other African countries, such as Kenya and Tanzania, and from other continents, for exampleAustralia and Latin America.

In light of an increased sophistication in client needs, natural and spiritual attractions seem to play more important roles in tourism development.Ecotourism can be marketed as a counterpoint to mass, packed tourism. For this reason many destinations are diversifying into ecotourism as traditional sun-and-sand alternatives are not as popular as they once were.

Ecotourism can mitigate the problems of seasonality associated with summer-sun packaged tourism; encourage independent, non-organized tourism; promote cultural tourism, as opposed to climatic attractions of destinations and last, but not least, satisfy the alleged demand for a more environmentally appropriate form of tourism.

The resource based-view (natural resources in ecotourism)

The resource-based view states that marshaling and uniquely combing a set of complementary and specialized resources and capabilities may lead to value creation. The proposition is that, even in equilibrium, firms may differ in terms of the resources and capabilities they control, and that such asymmetric firms may coexist until some exogenous change or Schumpeterian shock occurs (Wernerfelt, 1984; Barney, 1991; Peteraf, 1993; Amit and Schoemaker, 1993).

The resource-based view of the firm states that the possession of distinctive resources is critical if one wishes to attain competitive advantage (Barney, 1991; Miller and Shamsie, 1996; Peteraf, 1993). Smaller firms may be particularly pressed to reach beyond their boundaries to find and control such key resources (Dyer and Singh, 1998; Stinchcombe, 1965). For instance, SMEs may work together to integrate complementary assets, or even jointly promote investments in common resources (e.g. logistic infrastructure) that would otherwise be prohibitively costly. Essentially, this possibility of joint efforts results from various forms of inter form interdependencies that make the performance of a firm contingent on the performance of other firms in the same industry or market domain.

We regard the resource based-view as related to more traditional ecotourism being offered in the framework of natural resources. We regard natural tourism as being rather passive as it in many cases does not involve much involvement from the tourists. The tourist experience can be limited to seeing, hearing and smelling.

The dynamic capabilities point of view (spiritual dimensions of ecotourism)

We regard dynamic capabilities point of view as building on more modern ways of approaching tourism development by paying attention to spiritual dimensions of tourism development.

By definition the use of dynamic competencies involves adaptation and change. The dynamic capability approach criticizes both the Porterian industrial economics approach as well as the resource-based approach for neglecting the

tendency of industry and resource positions to erode over time (Teece et al, 1997; Hamel, 2000; Eisenhardt and Martin, 2000).

While the resource based view literature often has been concerned with questions of value appropriation and sustainability of competitive advantage,, a later extension of the resource based view, the dynamic capabilities approach explores how valuable resource positions are built and acquired over time (Teece et al., 1997). Dynamic capabilities are rooted in a firm's managerial and organizational processes, such as those aimed at coordination, integration and reconfiguration (Teece et al, 1997; Eisenhardt and Martin, 2000). These capabilities enable firms to create and capture Schumpeterian rents (Teece et al, 1997). Examples of such value-creating processes are product development, strategic decision-making, knowledge creation, and capabilities transfers (Eisenhardt and Martin, 2000).

The emergence of spiritual tourism clearly opens up new sources of value creation since relational capabilities and new complementarities among a firm's resources and capabilities can be exploited. We believe that spiritual tourism is more external as it takes place in social settings where the tourist plays an important role in the service delivery.

There are a number of conceptual avenues that can be followed when studying dynamic competencies. We use an approach derived from evolutionary economics. We try to illustrate that the use of dynamic competences is dependent upon routines (Nelson and Winter,1982; Feldman, 2000). We find routines interesting as they can be a source of creating new knowledge. This can be done by using routines in new ways. Such an approach should suit nicely into the realities of ecotourism asentrepreneurial initiatives come from local levels. Business renewal is at the center of the firm's attention, both to create its own internal context for breakthrough performance, and to grow by proactively searching for new markets to serve.

7. Innovation within Ecotourism in Southern Africa

Innovation is considered by many scholars and executives to be critical for firms to compete in turbulent business environments (Hitt et al, 1998; Ireland and Hitt, 1999). Hamel (2000) suggests that because the competitive landscape is nonlinear, it requires managers to think in nonlinear ways. Innovation literature is linked to concepts such as tailor making, commercialization and implementation. This means that an idea that is not developed or transformed into a product, or a service, cannot be regarded as an innovation (Fisher, 2001; Garcia and Calantone, 2002; McDermott and O'Connor, 2002).

The types of innovation we interested in studying more closely are technological innovations and marketingbased innovation. Technological innovations can be regarded as links between components, methods and processes leading to new products and services (Afuah, 1998). We link technological innovation to exploitation of knowledge. Marketing based innovations refer to how new knowledge can be embodied in distribution channels, products, applications, and in customer needs (Afuah, 1998). We link marketing innovation to exploration of knowledge.

By combining technological innovations and marketing based innovations it may be possible to analyze what makes tourism firms move from a situation with unclear priorities to a situation with a more clean-cut strategy. This means that we permit careful assessments of non-linear processes. Even if we can explain, ex post, how and why tourism firms moved from archetype X to archetype Y, or from position A to position B, it will not be fine-tuned enough to show how, de facto, change takes place (James, 1996, p. 26; Orlikowski, 1996; Feldman, 2000).

In order to succeed in ecotourism firms must be able to tailor make services to well defined market segments through a high degree of crafting, a concept that is related to principles in chaos theory.The use of craftwork, dating back to the early human history, laid the fundaments for civilized societies with a focus on urbanization and economics of scale. The technological developments in the eighteenth century, and particularly those of the nineteenth century, led to more use of machines and a decline in the use of craftwork, relatively speaking. The emergence of the knowledge economy leads to a renaissance of craftwork as novelty has become increasingly important as companies succeed in offering tailor-made solutions to carefully targeted market segments.

As the market for natural ecotourism in Southern Africa matures it will be necessary that spiritual dimensions of service deliveries become more important, moving the attention from a technological focus toward a more marketing oriented one. As the market for natural attractions of ecotourism matures, value adding services related to spiritual dimensions of ecotourism can represent a growth market, according to our reasoning.

In order to analyze how to market spiritual dimensions of ecotourism it can be worthwhile to repeat some findings in the marketing literature. During the 1990s and continuing into the 2000s the issue of value creation for customers started to gain interest in the marketing literature, at the same time as service marketing became more dominating. The prevailing view is that the value for customers is embedded in products that are outputs of firms' manufacturing processes. The view is called value-in-exchange (i.e. Rust et al, 2000). This logic is challenged by an alternative

viewpoint called value-in-use, where more focus is placed on value-generating processes (Vargo and Lusch, 2004; Gronroos, 2008). According to this view, value is not created by the provider but rather by customers' value-generating processes (Gronroos, 2008).

Customer satisfaction is the hub in a system that connects customer perceptions and emotional responses to subsequent behaviors and business performance. Customer satisfaction is defined as a customer's overall evaluation of an offering's performance (Fornell et al, 1996). Satisfaction includes an offering's ability to provide a pleasurable level of consumption-related fulfillment (Oliver, 1997). Theory suggests that the more experiences one accumulates and integrates into this satisfaction evaluation the more affective and emotional the evaluation becomes (Oliver, 1999).

The classical topic of customer satisfaction/dissatisfaction is still important as it is believed that customer satisfaction has long term benefits, including customer loyalty, and increased profitability (Anderson,1998; Rust and Verhoef. 2005). There is empirical research suggesting that satisfied customers are more loyal, are involved in cross-selling and participate in positive word-of-mouth advertising (e.g. Fornell et al., 1994; Fornell, 1996).

The marketing literature supports a clear links between customer satisfaction on one hand and business performance on the other (Bolton, 1998; Bolton and Lemon, 1999).Research conducted by Mittal and Kamakura (2001) shows a strong albeit nonlinear effect of consumer satisfaction on repurchase behavior for automobiles. With respect to financial performance, customer satisfaction is positively associated with operating margins, return on investment, accounting returns and shareholder value (see Anderson et al, 2004).

8. What is the Relationship between Innovation and Knowledge Creation?

We aim to illustrate how the ecotourism industry can become more competitive by focusing on knowledge creation and innovation. Knowledge creation and innovation have a strong and complex relationship, however, seldom examined.We suggest that innovation depends on knowledge creation (Popadiuk and Choo, 2006**)**.

According to our reasoning the resource based view is related to knowledge exploitation while there is a closer link between the dynamic capabilities point of view and the exploration of knowledge, While nature based ecotourism can be linked to exploitation of knowledge, we are of the opinion that spiritual ecotourism to a larger extent is linked to the exploration of knowledge.

While natural attraction in ecotourism can be linked to exploitation of knowledge (technological focus) we are of the opinion that spiritual dimensions of tourism development are more related to the exploration of knowledge (marketing focus)**.** However, this distinction must be used with care as natural tourism and spiritual dimensions of tourism development are not in conflict with each other but can be regarded as two sides of the same coin.

The accumulation of knowledge through learning constitutes a driving force as knowledge acquisition opens new business opportunities (i.e. Penrose, 1959). Tourism institutions in Southern Africa can engage in the exploration of knowledge for the purpose of developing new combinations of knowledge. Exploration involves discovery and experimentation, which can lead to increased productivity through repeated practices.

We believe that the exploration with the use of new processes is a main driver for knowledge creation in ecotourism in Southern Africa. Such a framework can be used as basic for designing path-breaking innovations (Schumpeter, 1947; Nelson and Winter, 1982; Galinic and Rodan, 1998; Fleming, 2001; Nekarand Roberts, 2004).

Insert Figure 1 Here

How to organize ecotourism in the future in Southern Africa can be a question of debate. We suggest that experiencesin the United Kingdom where one pound is paid per visit per day is used as a benchmark and is implemented in all types of tourism in Southern Africa. Such a tax can be welcomed in protected areas where tourism has a potential for hurting the environment. This argument should also be relevant within spiritual ecotourism.

In order for ecotourism projects to succeed governments need to facilitate the creation and growth of private enterprises in labor-intensive sectors of the economy through appropriate politics, infrastructure, and institutions. Reforms to improve the efficiency of capital markets will enable many more local entrepreneurs to create jobs that employ the poor. Lack of good infrastructure results in geographically fragmented markets and firms that are too small to exploit scale economics. Small and medium-sized enterprises need financing options, both when it comes to questions related to debt and equity.

9. Conclusion, Implications and Future Research

Given the great degree of complexity and turbulence in the Southern Africa economies, we use chaos theory, the resource based view and dynamic capabilities as our theoretical foundations. We suggest that radical steps in

marketing and technology are necessary if future growth can take place in both traditional ecotourism and spiritual ecotourism

As change becomes a constant in organizational life, managers in the ecotourism field are struggling to make meaning out of changes. In such contexts sensemaking becomes vital and difficult for managers. According to Weick (1995) sensemaking denotes efforts to interpret and create order for occurrences. Our aim in this article is to illustrate that managers can make sense out of dramatic changes in the tourism industry by focusing more on ecotourism and particularly spiritual ecotourism.

Organizational change spurs reframing, as actors seek to make sense of disparities between their expectations and new experiences (Balogun and Johnson, 2004). According to Bartunek (1984) frames provide a structure of assumptions, rules, and boundaries that guide sensemaking and over time become embedded and taken-for-granted. Shocks and surprises signal that existing frames may no longer apply as is the case where traditional management models make less sense in ecotourism. Reframing, therefore, enables actors to alter meanings attributed to changing situations (Watzalawick et al., 1974). Argyris's (1993) distinction between "single-loop" and "double-loop learning" offers an illustration. Single-loop signifies incremental variations within an existing frame, while double-loop denotes reframing, substantially altering an actor's view and thus enabling dramatic changes in understanding and action. We are of the opinion that the need for double-loop learning should be value for spiritual ecotourism as new management models should be welcome in an emerging growth market.

Ourstudy adds to a growing stream of research on strategy and entrepreneurship dealing with the emergence and competitiveness of clusters, or geographical concentrations of firms (Scmitz and Nadvi, 1999). Although early work on clusters accentuated the benefits that passively accrued to firms from their geographically agglomerating into larger markets, later research of the concept have tended to move away from this emphasis on passive agglomeration economies toward that of active networking among clustered firms (see also Christopherson and Storper, 1986; Markussen, 1999; Mesquita, 2007, Storper, 1997; Tallman et al., 2004). Our study contributes to this later trend in the cluster literature by illustrating that spiritual ecotourism can be a possible economic engine within selected geographical areas. .

We conclude with a call for more research on order to develop a fuller understanding of the interaction between innovation and knowledge creation. Our discussion here suggests that knowledge creation is focused on the generation and application of knowledge that leads to new capabilities of the firm. Innovation is also concerned with how these new capabilities may be turned into products and services that have economic value for markets. Knowledge about markets becomes a critical component of the innovation process, and how firms can proper in an increasingly competitive business environment.

We suggest that entrepreneurship literature is studied more closely as such literature often breaks with traditional business practices. We also believe that future research can benefit from studying more concrete business cases than done in this research, particularly extreme cases as learning effects can be achieved.

References

Abernathy, W., & Clark, K. B. (1985), Mapping the winds of creative destruction. *Research Policy*, 14, 3-22. http://dx.doi.org/10.1016/0048-7333(85)90021-6

Afuah, A. (1998). *Innovation Management: Strategies*, *Implementation, and Profits*, Oxford University Press, New York, NY.

Amit, R., & Schoemaker, P. (1993). Strategic assets and organizational rent. *Strategic Management Journal,* 14(1), 33-46. http://dx.doi.org/10.1002/smj.4250140105

Anderson, E. W. (1998), Customer satisfaction and word of mouth. *Journal of Service Research*, 1, 5-17. http://dx.doi.org/10.1177/109467059800100102

Anderson, E. W., Fornell, C., & Mazvancheryl, S. K. (2004), Customer satisfaction and shareholder value. *Journal of Marketing*, 68, 172-185. http://dx.doi.org/10.1509/jmkg.68.4.172.42723

Argyris, C. (1993). *Knowledge for action: A guide to overcoming barriers to organizational change*. Jossey-Bass, San Francisco.

Astley, W. G., & Zammuto, R. F. (1992). Organization Science, Managers and Language Games. *Organization Science*, 3(4), 443-460. http://dx.doi.org/10.1287/orsc.3.4.443

Bain, J. S. (1956). *Barriers to New Competition*. Harvard University Press: Cambridge, MA.

Bain, J. S. (1959). *Industrial Organization.* Wiley, New York.

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99-120. http://dx.doi.org/10.1177/014920639101700108

Balogun, J., & Johnson, G. (2004). Organizational restructuring and middle manager sensemaking. *Academy of Management Journal*, 47, 523-549. http://dx.doi.org/10.2307/20159600

Bartunek, J. M. (1984). Changing interpretive schemes and organizational restructuring: The example of a religious order. *Administrative Science Quarterly*, 29, 355-372. http://dx.doi.org/10.2307/2393029

Baumol, W., & Benhabib, J. (1989). Chaos: significance, mechanism, and economic applications. *Journal of Economic Perspectives*, 3, 77-105.

Beech, N., & Johnson, P. (2005). Discourses of disputed identities in the practice of strategic change. The mayor, the street-fighter and the insider-out. *Journal of Organizational Change Management*, 18(1), 31-47. http://dx.doi.org/10.1108/09534810510579832

Binns, T., & Nel, E. (2002). Tourism as a local development strategy in South Africa. *The Geographical Journal*, 168(3), 235-247. http://dx.doi.org/10.1111/1475-4959.00051

Bolton, R. N. (1998). A dynamic model of customers' usage of services: usage as an antecedent and consequence of satisfaction. *Marketing Science*, 17, Winter, 45-65. http://dx.doi.org/10.1287/mksc.17.1.45

Bolton, R. N., & Lemon, K. N. (1999). A dynamic model of customers' usage as services: usage as an antecedent and consequence of satisfaction. *Journal of Marketing Research*, 36, 71-86.

Brooks, G. (2008). Developing Guiding Principles for World Heritage as a Sustainable Tourism- A Major UNESCO World Heritage Center Initiative. *ICOMOS*, Burgerman, NSW/Australia.

Butler, A. (1990). A methodological approach to chaos: Are economists missing the point? *Federal Reserve Bank of St. Louis*, 72(13), 36-48.

Butler, R. W. (1980). The Concept of a Tourist Area Cycle of Evolution: Implications for Management of Resources. *Canadian Geographer*, 24(1), 5-12. http://dx.doi.org/10.1111/j.1541-0064.1980.tb00970.x

Cavaoco, C. (1995). Rural tourism: The creation of new tourist spaces In, Montanari, A. & Williams, A. (eds), European tourism: Regions, spaces and restructuring. *Chichester*, UK, 129-149.

Caves, R. E. (1972). *American Industry: Structure, Conduct, and Performance*, 3rd ed., Prentice-Hall: Englewood Cliffs, NJ.

Chakravarrthy, B. (1997). A new strategy framework for coping with turbulence. *Sloan Management Review*, 38(2), 69-82.

Chandy, R. K., & Tellis, G. J. (1998), Organizing for radical product innovation: The overlooked role of willingness to cannibalize. *Journal of Marketing Research*, 35 (4), 119-135. http://dx.doi.org/10.2307/3152166

Chiaburu, D. S. (2006). Managing Organizational change in Transition Economics. *Journal of Organizational Change Management*, 19(6), 738-746. http://dx.doi.org/10.1108/09534810610708387

Christoperson, S., & Storper, M. (1986). The city as studio, the world as back lot: The impact of vertical disintegration on the location of the motion picture industry. *Environment and Planning D: Society and Space*, 4, 305-320. http://dx.doi.org/10.1068/d040305

Cousins, B., & Classenes, A. (2003). CommercialLand Tenure in South Africa: Livelihood, Rights and Institutions. *Development Update*, 4 (2), 55-77.

Department of Land Affairs. (1997). *White Paper on Land Policy,* Department of Land Reforms, Pretoria (South Africa).

Dixon, S. E., Meyer, K. E., & Day, M. (2007). Exploitation an exploration learning and the development of organizational capabilities: A cross-case analysis of the Russian oil industry. *Human Relations*, 60 (10), 1493-1523. http://dx.doi.org/10.1177/0018726707083475

Eisenhardt, K. M., & Martin, J. A. (2000), Dynamic capabilities: what are they?. *Strategic Management Journal*, 21, special issue, 21(10-11), 1105-1121.

Elliott, G., Mitchell, B., Wiltshire, B., Manan, I. A., & Wismer, S. (2001), Coastal management: community participation in marine protected area management Wakatobi National Park, Sulawesi, Indonesia. *Coastal Management*, (29), 295-316.

Feldman, M. (2000),. Organizational routines as a source of continuous change. *Organization Science*, 11(6), 611-629. http://dx.doi.org/10.1287/orsc.11.6.611.12529

Fisher, M. (2001). Innovation, knowledge creation and systems of innovation. *Annals of Regional Science*, 35, 199-216.

Fleming, L. (2001). Recombinant uncertainty in technical search. *Management Science*, 47, 117-132. http://dx.doi.org/10.1287/mnsc.47.1.117.10671

Fornell, C., & Cha, J. (1994), Partial least squares, in Bagozzi, R. P. (ed), *Advanced Methods of Marketing Research*, Blackwell, Cambridge, MA, 52-78.

Fornell, C., Johnson, M. D., Anderson, E. W., Cha, J., & Bryant, B. E. (1996). The American Customer Satisfaction Index: Nature, Purpose and Findings. *Journal of Marketing,* 60, Oct., 7-18. http://dx.doi.org/10.2307/1251898

Galinic, D. C., & Rodan, S. (1998), Resource recombination's in the firm: knowledge structures and the potential of Schumpeterian innovation. *Strategic Management Journal,* 19, 1193-1201. http://dx.doi.org/10.1002/(SICI)1097-0266(1998120)19:12<1193::AID-SMJ5>3.0.CO;2-F

Garcia, R., & Calantone, R. (2002). A critical look at technological innovation typology and innovativeness terminology: A literature review. *Journal of Product Innovation Management,* 19(2), 21-35. http://dx.doi.org/10.1016/S0737-6782(01)00132-1

Gleick, J. (1987). *Chaos: Making a New Science*, Heinermann, London. .

Gronroos, C. (2008). Service logic revisited: who creates value? And who co-creates?, *European Business Review*, 20(4), 298-314. http://dx.doi.org/10.1108/09555340810886585

Hall. C. M., & Page, J. (1999). *The Geography and Tourism and Recreation: Environment and Place* (2nd ed.), Routledge, London.

Hamel, G. (1996). Strategy as revolution. *Harvard Business Review*, July-Aug.,69-82.

Hamel, G. (2000). *Leading the revolution*, Harvard Business School Press, Cambridge, MA.

Hassard, J., & Parker, M. (eds.). (1993). *Postmodernism and Organizations, Sage*, Thousand Oarks, CA.

Hay, D. A., & Morris, D. K. (1991). *Industrial Economics and Organization: Theory and Evidence*, Oxford University Press, New York.

Helfat, C. E.,& Peteraf, M. (2003). The dynamics resource-based view-capacity life cycles. *Strategic Management Journal*, 24, 997-1010. http://dx.doi.org/10.1002/smj.332

Henderson, R. M., & Clark, K. B. (1990). Architectural innovation: the reconfiguration of existing product technologies and the failure of established firm. *Administrative Science Quarterly*, 35(1), 9-22. http://dx.doi.org/10.2307/2393549

Hinings, C. R., & Greenwood, R. (1988). *The Dynamics of Strategic Change*, Basil Blackwell, Oxford (UK).

Hitt, M. A., Ricarti Costa, J. E., & Nixon, R. D. (1998). *The new frontier, In Managing Strategically in an Interconnected World.* Hitt, M. A, Ricarti Costa, J. E, & Nixon, R. D. (eds). Wiley: Chichester, 1-12.

Hofer, C. W. (1975). Toward a contingency theory of business strategy. *Academy of Management Journal,* 18, 784-810. http://dx.doi.org/10.2307/255379

Hofer, C. W., & Schendel, D. (1978). *Strategy Formulation: Analytical Concepts*. West: St. Paul, MN.

Hoggart, K., Buller, H., & Black, R. (1995). *Rural Europe: Identity and change*, Arnold: London.

ICOMOS. (1999). *International Cultural Tourism Charter*, ICOMOS.NSW/Australia.

ICOMOS. (2008). International Cultural Tourism Committee,Developing and Polities for World Heritage and Sustainable Tourism. *ICOMOS Science Symposium,* Quebeck (Canada).

Ireland, R. D., & Hitt, M. A. (1999). Achieving and maintaining strategic competitiveness in the 21st century: the role of strategic leadership. *Academy of Management Executive*, 13(1), 43-57. http://dx.doi.org/10.5465/AME.1999.1567311

James, W. (1996). *A Pluralistic Universe*, University of Nebraska Press, Lincoln, NE.

Langley, A. (1999). Strategies or Theorizing from Process Data. *Academy of Management Review*, 24(49), 691-710.

Leibold, M., Probst, G., & Gibbert, M. (2002). *Strategic Management in the Knowledge Economy*, John Wiley, & Sons, Weinheim.

Lorentz, E. N. (1963). Deterministic non-periodic flow. *Journal of the Atmospheric Sciences*, 20(2), 130-141. http://dx.doi.org/10.1175/1520-0469(1963)020<0130:DNF>2.0.CO;2

Lyotard, J. F. (1984). *The postmodern condition: A report on knowledge*, Reading (UK).

Luloff, A., Bridger, J., Graefem, A., Saylor, M., Martin, K., & Gitelson, R. (1994). Asssessing rural tourism efforts in the United States. *Annals of Tourism Research,* 2(1), 46-64. http://dx.doi.org/10.1016/0160-7383(94)90004-3

March, J. G. (1994). *A primer on decision-making*: How decisions happen, The Free Press, New York.

Markusen, A. (1999). Sticky places in slippery space, In Gertler, M. S. (ed.). *New industrial geography: Regions, regulations and institutions*, Routledge, Florence, KY, 98-124.

Mason, E. S. (1939). Price and production policies of large scale enterprises. *American Economic Review*, 29, 61-74.

McDermott, C., & O'Connor, G. C. (2002). Managing radical innovation: An overview of emergent strategy issues. *Journal of Product Innovation Management*, 19(6), 99-112. http://dx.doi.org/10.1016/S0737-6782(02)00174-1

Mesquita, L. F. (2003). Rationality as the basis for a new institutional environment: Argentina's former presidential candidate Ricardo Lopez Murphy. *Academy of Management Executive*, 17(3), 44-50.

Mesquita, L. P. (2007). Starting over when the bickering ever ends: Rebuilding aggregate trust among clustered firms through trust facilitators. *Academy of Management Review*, 32, 72-91. http://dx.doi.org/10.5465/AMR.2007.23463711

Mesquita, L. F., & Lazzarini, S. G. (2008). Horizontal and vertical relationships in developing economics: implications for SMEs' access to global markets. *Academy of Management Journal*, 51(2), 359-380. http://dx.doi.org/10.5465/AMJ.2008.31767280

Meyer, A. D., Goes, J. B., & Brooks, G. R. (1993). Organizations Reacting to Hyperturbulence, in Huber, C. P., & Glink, W. H. (eds.). *Organizational Change and Redesign: Ideas and Insights for Improving Performance*, Oxford University Press, Oxford.

Mueller-Stewens, G., & Lechner, C. (2001). *Strategischers Management: Wiestrategische Initiativenwirksam warden*, Schaeffer-PoeschlVerlag, Skuttgart (Germany).

Nelson, R. R., & Winter, S. G. (1982). *An Evolutionary Theory of Economic Change*, Belknap Press, Cambridge, MA. .

Nerkar, A., & Roberts, P. W.(2004). Technological and product-market experience and the success of new product introductions in the pharmaceutical industry. *Strategic Management Journal*, 25, 779-799. http://dx.doi.org/10.1002/smj.417

North, D. C. (1990). *Institutions, institutional change, and economic performance,* Cambridge University Press, New York.

Orlikowski, W. J. (1996). Improvising organizational transformation over time: a situated change perspective. *Information Systems Research*, 7, 63-92. http://dx.doi.org/10.1287/isre.7.1.63

Penrose, E. T. (1959). *The Theory of the Growth of the Firm*, Basil Blackwell, London.

Peteraf, M. A. (1993). The cornerstone of competitive advantage: A resource-based view. *Strategic Management Journal,* 14(3). 179-191. http://dx.doi.org/10.1002/smj.4250140303

Popadiuk, S., & Choo, C. W. (2006). Innovation and knowledge creation: how are these concepts related?. *International Journal of Information Management*, 26, 302-312. http://dx.doi.org/10.1016/j.ijinfomgt.2006.03.011

Porter, M. E. (1980). *Competitive strategy*, The Free Press. New York, NY.

Porter, M. E. (1985). *Competitive advantage*,The Free Press, New York, NY.

Porter, M. E. (1998). Clusters and competition: New agendas for companies, governments, and institutions, In Porter, M. E. (ed.). *On competiveness*, Harvard Business School Press, Boston, 197-288.

Roos, J., & Victor, B. (1999). Towards a new model of strategy-making as serious play. *European Management Journal,* 17(4). 348-355. http://dx.doi.org/10.1016/S0263-2373(99)00015-8

Rosenau, P. M. (1992). *Postmodernism and the social sciences: Insights, inroads, and intrusions*, Princeton, NJ.

Rust, R. T., & Verhoef, P. C. (2005). Optimizing the marketing interventions mix in intermediate-term CRM. *Marketing Science*, 24, 477-489. http://dx.doi.org/10.1287/mksc.1040.0107

Schumpeter, J. (1947). The creative response in economic history. *Journal of Economic History*, 7, 149-159.

Schmitz, H., & Nadvi, K. (1999). Clustering and industrialization: Introduction. *World Development,* 27, 1503-1514. http://dx.doi.org/10.1016/S0305-750X(99)00072-8

Sengenberger, W., Loveman, G. W., & Piore, M. J. (1990). The reemerge of small enterprises: Industrial restructuring in industrialized countries. *IlO,Geneva*,(Switzerland).

Shane, S., & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of Management Review*, 25, 217-226.

Shephered, W. G. (1975). *The Treatment of Market Power: Antitrust, Regulation, and Public Enterprise*. Columbia University Press, New York.

Soulsby, A., & Clark, E. (2007). Organization Theory and the Post-socialist Transformation: Contributions to Organizational Knowledge. *Human Relations*, 60 (10). 1419-1442. http://dx.doi.org/10.1177/0018726707083470

Stiegfrid, J. J., & Evans, L. B. (1994). Empirical studies of entry and exit: a survey of the evidence, Review of Industrial Organization, 2, 121-155. http://dx.doi.org/10.1007/BF01035654

Stacey, R. D., Griffen, J. D., & Shaw, P. (2000). *Complexity and Management: Fad or Radical Challenge to Systems Thinking*? Routledge, London.

Stiegfrid, J. J.& Evans, L. B. (1994). Empirical studies of entry and exit: a survey of the evidence, *Review of Industrial Organization*, 2, 121-55. http://dx.doi.org/10.1007/BF01035654

Stinchcombe, A. L. (1965). Social Structure and Organizations, In March, J. G. (ed.). *Handbook of organization*, RandMcNally, Chicago, 142-193.

Storper, M. (1997). *The regional world: Territorial development in a global economy*, Guildford Press, New York.

Szulanski, G., & Amin, K. (2001). Learning to make strategy: balancing discipline and imagination. *Long Range Planning*, 34, 537-556. http://dx.doi.org/10.1016/S0024-6301(01)00073-5

Teece, D. J, Pisano,G., & Shuen, A. (1997). Dynamic capabilities and strategic management, *Strategic Management Journal*, 18(7). 509-533. http://dx.doi.org/10.1002/(SICI)1097-0266(199708)18:7<509::AID-SMJ882>3.0.CO;2-Z

Tushman, M. L., Anderson, P. C., & O'Reily, T. (1997). Technological cycles, innovation streams and ambidextrous organizations: organizational renewal through innovation streams and strategic change, InTushman, M. L. & Anderson P. (eds). *Managing strategic innovation and change: A collection of readings*, Oxford University Press, New York.

Tallman, S., Jenins, M., Henry, N., & Pinch, S. (2004). Knowledge, clusters, and competitive advantage. *Academy of Management Review*, 29, 231-258.

Vargo, S. L., & Lusch, R. F. (2004). Evolving to a new dominant logic for marketing. *Journal of Marketing*, 68, 1-17. http://dx.doi.org/10.1509/jmkg.68.1.1.24036

Von Krogh, G., Ichijo, K., & Nonaka, I. (2000). *Enabling knowledge creation*, Oxford University Press, Oxford (UK). http://dx.doi.org/10.1093/acprof:oso/9780195126167.001.0001

Wahab, S., & Pigram, D. (1997). T*ourism development and growth: the challenge of sustainability*, Routledge, London.

Knowledge creation

Innovation (technology and marketing)	**Exploitation of knowledge** **Traditional ecotourism (nature)** Use of technology/ (the resource based view	**Exploration of knowledge** **Newer forms of ecotourism (spiritual dimensions)** Use of marketing/ (dynamic competencies
New processes	Regular innovations (A) Incremental innovations (B)	Revolutionary innovations (A) Major process innovations (B) Technological innovations (D)
Existing processes	Niche innovations (A) Modular innovations (B)	Radical innovations (B) Process/product and service innovations (C) Market breakthroughs (D)

Figure 1. Innovation and Knowledge Creation in Ecotourism in Southern Africa

(A) Abernathy and Clark (1985)
(B) Henderson and Clark (1990)
(C) Tushman et al (1997)
(D) Chandy and Tellis (1998)

Social Entrepreneurship and Corporate Social Responsibilities

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Abstract

This article emphasizes the meaning of social entrepreneurship and that of corporate social responsibility and the role held in social value creating process. There are several opinions regarding the distinctions between social entrepreneurship and corporate social responsibility considering the implications, the impact and the stimulus. This article will point out our approach regarding Social Entrepreneurship and Corporate Social Responsibility based on our research made in Cluj County from northwestern part of Romania, by highlighting their characteristics and the way that both processes influence the social environment. The research was made using two types of questionnaires which were applied to commercial enterprises and NGO's with social purpose.

Keywords: Social entrepreneurship, Corporate social responsibility, Cluj

1. Theoretical Approach

1.1 Corporate Social Responsibility

Corporate Social Responsibility (CSR) brings many benefits being considered an important lever in supporting social entrepreneurship (Austin 2007, Austin et all, 2006, Austin, et al., 2004, Austin and Reavis 2002, Austin, 2000). Also, CSR has a significant role in the social value creation process for both, businesses and social purpose organizations. The concept of corporate social responsibility is a broad term being used in various forms such as corporate citizenship, corporate social involvement or community, corporate philanthropy. CSR policies help firms to fulfill economic and social responsibilities ensuring wellbeing and social welfare (Hockerts, 2007). CSR policies can be considered as being companies' commitment to improve society through business practices (Kotler and Lee, 2005). It refers to sustainable economic development working with employees and their families, local community and society as a whole, in order to improve their standard of living (World Business Council for Sustainable Development, 2004).

CSR policies are seen as being "business decisions" that pass beyond the economic and technical interests of the organization (Carroll, 1991). CSR initiatives are major activities undertaken by a firm in order to sustain social causes and to fulfill its commitment to corporate social responsibility. It covers areas like: health (AIDS, cancer), safety (crime prevention), education (education for those in need), job creation (training practice) environment (recycling) economic and social development (low interest loans for purchase of apartments), and it meets other basic human needs and desires (combating hunger, poverty, discrimination) (Wills, 2009).

Social involvement is a corporative integrative function of the company involving practices that contribute to the establishment of positive relationships with communities and society at various levels (Waddock, 2004). The approach given by the International Business Forum (2003) and Tracey et all (2007) assumes that corporate social involvement means the investing collaboration relations and partnerships with non-profit and public sector in order to create healthy and favorable conditions, targeting both, community and business. Businesses can help significantly social organizations trough partnerships. This can happen either through a department of an entrusted

organization, as a department within the corporation or by a team of representatives of different companies (Wills, 2009).

Through CSR a company seeks to minimize risks and adverse effects maximizing economic and social benefits, it establishes relationships based on trust to promote progress in accordance with ethical principles and moral values institutionalization and it supports its financial and economic values (Corporate Citizenship Report, 2005).

Although definitions abound, we can say that two main directions can be highlighted, that CSR policies can be developed as standalone project or networking with other companies and social organizations targeting groups such employees, customers, nonprofit organizations, public authorities, the media.

1.2 Social Entrepreneurship

In the field of social affairs, researchers have demonstrated the importance of social entrepreneurs to solve social problems in relation to the state, having the role to endorse social entrepreneurship (social enterprise, NGOs with social cause). Social entrepreneurship is defined the way of using resources to create benefits for the society and the social entrepreneur is the person who seeks to benefit society through innovation and risk taking (Tracey et all, 2007). Thus, social entrepreneurship is the field that allows observation of how social problems can be solved in a sustainable way. Many approaches to social entrepreneurship sustain that the emphasis is actually on the individual more than on a collective model (Bornstein, 2007, Austin et al., 2007, Dees et al., 2001a,b, Leadbeater, 1997). Thus, social entrepreneurs identify what does not work inside society, trying systematically to impose change on different social levels, without giving up before achieving the expected goal (Drayton, 2002). Social Entrepreneurship arises when people run by social mission, act better than competitors driven by the entrepreneurial behavior (Mort et all, 2003). Hartigan (2006) believes that social entrepreneurship follows the transformation of entrepreneurship in a progressive way. This definition involves entirely new models, innovative, ingenious ones based on identifying opportunities. Casson (1982) shows that social entrepreneurship can be seen as a process met both in private and public sector. Many authors have given various nuances to the concept (Bornstein 2005, Nicholls 2006, Light 2008, Elkington and 1994). Korosec and Berman (2006) include social entrepreneurship in the process of individuals or of the private organizations that have the initiative to identify and solve social problems, in order to develop new ways of solving social problems. From this perspective social entrepreneurship identifies opportunities, collaboration and teamwork, social corporate involvement and the adaptation of business principles to social issues. In Romania, the Ministry of Labor, Family and Social Protection uses for the term social entrepreneurship the notion of social economy, which refers to a group of people gathered in order to undertake an active economic role in the process of social inclusion, NGOs (foundations and associations) and other non-profit organizations that have an important role in social value creation.

Social entrepreneurship is mainly found as an interaction between NGO's and other organizations, through self-sustainable and independent activities that are constantly changing economic and legal framework within a country. However, where there is adequate collaboration between the private sector that has the experience and ability to develop the commercial side of social organizations several forms of organization can be developed with different social outcomes.

2. Research Methodology

Interdisciplinary character of our research is confirmed by two relevant models. Thus the model developed by Tracey et all (2007) deals with four distinct forms of cooperation between enterprises and organizations with social mission, (charitable contributions, the enterprise internal projects, collaborations and partnerships), giving simultaneously an overview of the interface area of Corporate Social Responsibility and social entrepreneurship. Also Seitanidi (2008) emphasizes the existence of three forms of partnership across sectors, namely: public-private partnerships, public- non-governmental organizations and private partners-NGOs. Professor Rob John, supported by the Skoll Center for Social Entrepreneurship at Oxford Said Business School has treated in detail the relationships between organizations and social entrepreneurs who assist them. The survey had a structured form and was based on two questionnaires adapted to enterprises and NGOs considering the criteria of social entrepreneurship (Borza et al, 2009). The data collection process was made indirectly through e-mails and was implemented at top management level of businesses and NGOs. To increase the response rate of organizations in the survey, we also used direct interviews. The study is focused on identifying the way that NGOs and commercial enterprises sustain social entrepreneurship and emphasis the differences and similarities between social involvement among companies and NGOs.

Research Hypotheses pursued during the research

General Hypothesis:

1. Social Entrepreneurship is a real phenomenon that has applicability in the current social environment in Cluj

2. Social entrepreneurship and corporate social responsibility are clearly distinguishable but have a common aspect given by the social impact.

Secondary Hypotheses

1. Social involvement is seen by companies more as an obligation rather than as an act of will.

2. Large enterprises have a greater susceptibility to implement CSR practices.

3. CSR practices are regarded as a mean for acquiring competitive advantage.

4. The main problems in promoting social entrepreneurship in Romania is given by law, bureaucracy, and lack of support.

5. The groups targeted by enterprises and NGOs are disabled people, minorities, elderly.

Based on these hypothesis we investigate all NGOs active in the range of Cluj County. Simultaneously a random probabilistic sampling was conducted. Using the Taro Jamane method, we established a sample of 394 enterprises, excluding family associations and individuals and 234 NGOs as sample base. We obtained a response rate of 20% from enterprise, evidenced by 79 of the questionnaires and a response rate of 31% from NGOs, materialized in 76 questionnaires.

Research restrictions were the low rate of responses that required an extension of time for data collecting, the increased reluctance among business representatives to provide an input, the failure to timely existing records held by the competent organs at county level as well as the lack of the empiric research in the field.

2.1 The Structure of the Commercial Enterprise Sample

The legal form of companies included in the sample has the following structure: 79% Ltd, 19%Plc 2% other. The number of employees included in the sample companies allowed us to classify them in micro enterprises (32 enterprises), in small (24 enterprises), in medium (13 enterprises) and large (10 enterprises). Most enterprises were created after 1990. Taking into account the geographical coverage where they operate, we noticed that about 27% have an international activity, 38% a national activity**,** and 16% a local one. At the international level, the most frequently mentioned countries were: France, Germany, Italy, Austria, Spain, Korea and USA. The companies included in the sample operate in a regional area, mostly in Transylvania and Banat. Also 75.6%, of the companies involved in the research are independent organizations 6.4% parent organization and 18% subsidiaries.

2.2 The Structure of the NGO's Sample

The legal form of NGOs included in the sample has the following structure: 64 % are Associations, 28% Foundations, 4% Trading Companies, 4% other. Approximately 80% are focused on communities' problems, consultancy and social service while the rest were focused on protecting the environment and production. An expected issue was confirmed by the fact that the grate majority of NGOs were created after 1989. Since then the number of NGOs registered a significant boom reaching over 2000, meaning that their number has increased by threefold. Also 75.9% of NGOs have up to 10 employees and 97% have up to 10 part-time employees, 52.7% had up to 10 volunteers. Given the sample 60 of the organizations are independent, 3 of which are parent organizations and only 13 were subsidiaries. Of the total independent organizations, 18 have a range of international action, 12 national, 10 regional and 18 local action. Given the fact that independent organizations have the greatest weight, it can be observed that half of them have an impact covering an extended area (international and national). The independent organizations have a greater degree of flexibility and a much higher impact compared to the parent and subsidiary organizations.

3. Results of the Researches

3.1 Enterprises from Cluj County

3.1.1 Social Mission

Regarding the elements that characterize the mission of a company, the obtaining of profit was for 88.4% of the respondents the most important. Creating new jobs for 15.2% of respondents is not an element of their mission, 13.9% have shown that this is important only to a very limited extent and only 12.7% have indicated that this element is important. We observed that innovation has a low importance for most of the enterprises, taking into account that the majority of the respondents are SMEs. This is considered truly negative, since it is known that SMEs are those ones which should promote innovation (Borza et all, 2009). Regarding the use of non-conventional resources, only 8.9% of the respondents considered as being an important matter in a very large extent**.** Based on these results we believe that the firms do not show an increased interest for unconventional resources and for

innovation. Although non-conventional resources are considered extremely important in developed countries, our results confirm the opposite.

3.1.2 The Involvement of the Enterprises to Employ Disadvantaged People

Companies have a reticence regarding employing minorities or the employing of people with disabilities. This can be noted by the fact that 67.1% of respondent companies have no employees with a disability; only 29.1% have between 1 and 4 employees with disabilities and 3.8% between 5 and 9 employees with disabilities. Also, 50.6% of the firms have no minorities as employees. There is a limited availability of enterprises to include people with disabilities, former prisoners, former drug addicts, homeless people and Romani people. Thus 86.1% claimed that they would not hire former prisoners, 93.7% would not employ former drug addicts, 89.9% would not employ homeless, 81% would not hire Romani people and 75.9% would not employ people with disabilities. Under this circumstance the chances for this people to find employment are very low. Also, 44% consider that this type of resources would not be used under no circumstances, 19% believed that they would accept to take use of such resources only if the state would provide financial incentives, 5.1% only if they would be forced by circumstances, and 7.6% if they will not have other alternative. Only 24% believed that these could have potential, but it could also dependent on the field and the business.

3.1.3 Enterprise' Economic Activity

Analyzing the business strengths, the majority of the respondent companies considered marketing and sales, human resources management, less important were R&D and the access to funding. Marketing and sales are considered by most companies as being relevant since more than 50% of the respondent companies are in the field of services. Taking into account the additional income sources from which companies can gain access, we observed that for more than 80% of the respondents, donations are not a source of additional income. Governmental grants are not a source of additional income according to 70.9% of respondents, and also funding projects were considered by 74.7% as not being a source of additional income.

3.1.4 Social Involvement

Approximately 21.6% of the respondent companies have indicated that they are not involved in socially responsible activities and only 2% mentioned that were involved before 1990. The remaining 76.6% specified that they were socially involved after 1990. As expected, all firms that started their social activities after 1991 but mainly after 2000.

3.1.5 Advantages and Disadvantages Resulting from Social Involvement

Also 78% have shown that this involvement has not brought economic benefits to enterprises. Only an amount of 22% noted that social involvement brought benefits. The mentioned benefits were the following: 28% increased reputation, approximately 12% have indicated that they influenced sales growth, 20% felt that it adds value to the company, 40% have shown that social involvement brings owner satisfaction. Based on the question which seeks to identify social disadvantages arising from the involvement of companies, we have found that 58.9% of the respondents considered the total cost increased as the main disadvantage, 30.4% considered the use of additional resources and 12.5% considered that decreases the efficiency. From a total of 55 valid responses to the question about the problems faced when providing the support was mentioned bureaucracy by 47.3% of the respondents, 23.6% mentioned legislative restrictions, 12.7% difficulties in attracting volunteers.

3.1.6 Social Impact

The final purpose of the social activities of the enterprises emphasized that the main groups were people with disabilities, children and youth and the local community. The financial support is preferred than the material one. However, there were other forms of assistance such as providing food and clothing and offering jobs to those in needs, but they acquired a low percentage. The assessment of the social impact does not represent a significant concern for enterprises that engage socially. But among those who have such a method, most of them have specified that the amounts allocated and the scope of the results give an idea of social involvement.

3.1.7 Partnership with NGOs

Also, 74% of the respondents have indicated that they would not make a partnership with NGOs to achieve social responsibility policies. The rest agreed on the idea of having a partnership with an NGO, they have chosen as a means of collaboration the following: 22% agree with the establishment of a partnership, 20% would work on long term with an NGO, 3% would create a foundation on its own initiative, 35% have indicated that they will establish a partnership only if the NGO would be the beneficiary, 10% believed it would work only if the social activities would be complex, and only 10% have worked in order to increase the social impact.

Among the benefits of having a partnership with an NGO, companies considered owner satisfaction as being the biggest advantage of these collaborations, followed by rising notoriety and by a good relationship with the social sector. We noticed that these companies had a strong policy regarding social responsibility activities sustained on long term. Corporate social responsibility is considered by some companies as a competitive advantage and considering this fact we observed that most of the respondents would react if other firms would develop a competitive advantage in a similar area. This response is expected especially because we can talk about the commercial area where only the best companies can win.

3.2 NGO's of Cluj County

3.2.1 Social Mission

All the NGOs included in the survey had a social mission.

3.2.2 The Employment of Disadvantaged People

Our study underlines that women feel more ready to engage in NGOs than men. Approximately 74.6% of the NGOs have fewer than 10 full-time employees, 15.3% of them have between 11 and 20 full-time employees. It is considered that NGOs create social value and employment opportunities for people with disabilities, minorities or the socially excluded. We observed that the number of disabled people employed by NGOs was lower than the number of the minorities employed by these organizations. We can deduce that the vast majority of the NGOs do not have a significant number of employees, financial restrictions being this one of the main reasons. However, the necessary labor is completed in a significant extent through voluntary acts.

3.2.3 The Economic Activity of the NGO

The sources of income, which the NGOs base on, are made up of donations, economic activities, state subsidies and funding projects. Thus, we observed that donations and funding projects provide a significant contribution to total revenues of the NGOs. Another aspect to be noted is that there are organizations which undertake economic activities that provide up to 100% of total revenues. This fact points out that NGOs are not indifferent to the advantages that arise from economic activities. Also the vast majority of the NGOs have shown that donations mostly come from external sources. Among the activities that generate the highest revenue are the following: education 62.3%, counseling 29.6%, health 32.4%, manufacturing 18%, tourism 18.3%, 17% arts.

3.2.4 Social Involvement

The results have shown that NGOs sustain competitiveness. When the respondents were asked about their predisposition to collaborate with other NGOs acting in the same area, only 25.7% considered that it would bring a lot of benefits, 59.5% of the respondents claimed that they would try to be more competitive and only 14.8% claimed that they would be indifferent. It is surprising that most respondents are against alliances, especially considering their mission to promote social cause**.** But this highlights a positive aspect, namely the desire to be better than rivals, something which can lead to higher powers and an increased social impact. Among those who argued that activity they carried out made a difference through a new product, 83.3% of them would try to become more competitive while only 16% would establish a partnership with competitors. The study reveals that a fairly large proportion of the total NGOs that bring something new through the resourced used did not show a great interest for innovation. This means that they do not show a real concern for conservation and rationalization of resource consumption.

3.2.5 Advantages and Disadvantages of Social Involvement

Analyzing the support received by NGOs from local authorities, social purpose organizations, the local community, businesses, family and friends of the NGOs representatives we observed that approximately 75% of respondents considered that local authorities do not play a major role in providing the necessary help. Family and friends of NGOs representatives play a significant role. The local community also pays a particular contribution to NGOs, but none of the respondents considered it as being a very important one. Regarding the business sector, we noticed that 65% of the respondents consider the help provided by this as being important only in a small and a very small extent. For a deeper analysis we wanted to see the way that banks, investors, customers, suppliers and consulting firms are sustaining NGOs. Most of the respondents classified the support given by these actors from the business environment as being not important. Even so, we have observed that banks, clients and consulting firms have a greater contribution than the rest. The main concerns regarding the fund rising are given by the lack of funding, the bureaucracy and the lack of experience. These cases are not surprising, considering the fact that NGOs face many difficulties and limitations reaching a self-sustainable statute. Not having the required resources at the proper time brings many problems such as attracting qualified staff, holding the necessary resources to streamline the social impact, etc. Bureaucracy is also another major cause of the difficulties faced by NGOs given the uncertainty and

ambiguity of the legal framework and the limits imposed by the incorrect application of law.

3.2.6 Social Impact

NGOs are primarily oriented towards solving problems of disabled people, local community, children and young people.

Insert Figure 1 Here

Compared to companies, the target groups such as prisoners, people with difficulty in training, unemployed, and refugees are not considered high interest groups. Most of the NGOs measure social impact trough quantitative measures such: quantifying the number of the people helped and the amount spent with the social cause. Unfortunately the measures used are focused on evaluating short term impact.

4. The Implications of the CSR in the Process of Social Entrepreneurship

Social involvement of commercial enterprises is a practice that can start either from the existing theory in this field or from experience of other companies, however most things are learned from the experience of conducting business as a result of social responsibility programs. Certainly social involvement is achieved gradually from initiatives that do not involve too many resources and may lead in time to sustain social entrepreneurship through the establishment of organizations developed to work effectively and to support social causes. Perception of social involvement by citizens is often marred by mistrust and suspicion which is a challenge for many companies. Unfortunately the desire to be competitive puts an intense pressure on the enterprises, considering their social involvement as a resource that consumes far too much. So when the involvement in projects does not bring a contribution to enterprise's development, human and material resources allocated to social responsibility motivation and effort is minimized or even eliminated. This situation is somehow justified in the context in which businesses conducts activities oriented towards profit rather than towards charities. To support the involvement of social enterprises one must have a solid economic situation, any social engagement, requiring the mobilization of resources can be allocated for other purposes affecting business prosperity. Taking into account the dimensions of social responsibility leading to competitive advantages such us: risk, efficiency, brand promotion of new markets (Hokerts, 2007), we have observed that companies avoid social involvement to reduce risks. Somehow we can say that it is justified in this context that smaller firms avoid to get involve in social responsible activities because of the lack of the necessary resources. The relationship between social and financial performance affects the competitive advantage of the company, arising from the social responsibility programs undertaken. This type of programs can help companies to gain a competitive advantage.

Companies can sustain social entrepreneurship, being trigger factor of social entrepreneurship. This can be done through collaborations, partnerships, or through putting the basis for creating a social mission organization. Not all organizations that sustain social mission are within the social entrepreneurship spectrum, only those who really meet the criteria of social entrepreneurship (Borza et all, 2009). Organizations that promote social entrepreneurship will get a considerable advantage due to the resources and the support received to sustain social mission and companies will gain notoriety and a positive image with good results over economical activities. Cross sectors collaboration enhance the potential of having a positive effect over social problem solving process. Collaborations throughout the organizations and their partners develop long term projects, permit the change of perspectives, so commercial organizations become more social oriented and social organizations become more commercial oriented. Organizations that sustain social entrepreneurship must recognize the advantages given by commercial activities and therefore trying to become self-sustainable

5. Conclusions

Social entrepreneurship is a viable alternative that can cover various forms of organizations, but in our opinion NGOs with social mission provide the premises to sustain social entrepreneurship. Starting from general assumptions, which consists the basis of our research, we concluded that social entrepreneurship is a process that can be identified in the current social environment of Cluj County and that it is manifested mainly in the form of independent organizations wishing to implement innovative practices which allows solving social problems. NGOs and companies create social values using different approach, but we consider that a grater impact will be achieved if these will be inter-correlated, establishing a cause effect manifestation, which increases economical and social performances in both cases. Even if we observed that for most companies philanthropic collaboration is preferred mainly because is the simplest type of collaboration due to the resources and benefits involved, there are some companies, very few, that prefer complex forms of collaborations.

Social entrepreneurship has a grate potential of applicability in Romania, but there is a need for developing supportive facilities to sustain companies to invest in CSR policies, and to increase transparency with the purpose of

identifying those organizations that really contribute to perpetuation of social entrepreneurship process. Companies have a more specific approach when it comes of choosing the targets compared with NGOs that have a more broad-spectrum. This emphasize that companies chose the target that best fits the mission statement rather than NGO that chose the target based mostly on communities needs.

We observed the fact that companies because of their commercial purpose see social involvement more as an act of will and for grate majority, the decision of getting involved in social causes comes because of owner satisfaction and not necessarily because of the positive impact over the company. Even so large companies were more likely to invest in CSR policies due to greater financial power and because CSR policies are seen a significant policies of gaining competitive advantage. In this case the image on the market tends to have a significant importance and CSR policies are the best mean to strengthen the market position.

The conducted survey emphasizes the particularities of social environment from Cluj County using several criteria with the purpose of observing the way commercial enterprises and NGOs contribute to social value creating process. Based on these two researches we conclude that NGOs have better chances to promote social entrepreneurship starting with the fact that these have first of all a social mission. Also we can say that social entrepreneurship can be sustained by the companies through CSR (partnership, collaboration, founding an organization with a social mission). Corporate social responsibility and social entrepreneurship have distinct conceptual approach, but interferes in the area of recovery of social opportunities.

References

Austin, J. E., Skillern, J. W., Leonard, H., & Steverson, H. (2007). *Entrepreneurship In The Social Sector*, California: Sage Publications.

Austin, J., Gutierrez, R., Ogliastri, E., & Reffricco, E. (2006). *Effective Management of Social Enterprises. Lessons from Business & Civil Society Organizations in Iberoamerica*, Harvard University Press.

Austin, J. E., Jane W. - S., & Alexis, G.. (2004). *Starbucks & Conservation International*. *Teaching Note*, 304-100, Harvard Business School, Division of Research, Boston.

Austin, J. E., & Cate, R. (2002). *Starbucks & Conservation International*. *Teaching Case*, 303-055, Harvard Business School, Division of Research, Boston.

Austin, J. E. (2000). *The Collaboration Challenge How Nonprofit & Businesses Succeed Trough Strategic Alliances*. London: Peter Druker Foundation.

Bornstein, D. (2007). *How to Change the World Social Entrepreneurs & the Power of new Ideas*.

Bornstein, D. (2005). *How to Change the World: Social Entrepreneurs & the Power of New Ideas*. Penguin Books: New Delhi, India.

Borza, A., Mitra, C., & Bordean, O. (2009). *Social Entrepreneurship in the Context of the Romanian Transitional Economy*, in Complexity Science & Social Entrepreneurship Adding Social Value through Systems Thinking A Volume in the Exploring Organizational Complexity Series Volume 3, New York.

Carroll, A. B. (1991). *The Pyramid of Corporate Social Responsability*: Toward the Moral Management of Organizational Stakeholders**.** Business Horizons, july-august

Casson, M. (1982). *The Entrepreneur*. Totowa, NJ: Barnes & Noble Books

Corporate Citizenship Report. (2005). The Center for Corporate Citizenship at Boston College

Dees, J. G. (2001). *The meaning of Social entrepreneurship*. *Available*: http//faculty.fuqua.duke.edu/centers/case/files/dees-Se.pdf

Dees, J. G., Emerson, J., & Economy, P. (2001a). Enterprising Nonprofits: A Toolkit for Social Entrepreneurs, John Wiley &Sons: New York

Dees, J. G., Emerson, J., & Economy, P. (2001b). Strategic Tools for Social Entrepreneurs: *Enhancing The Performance of Your Enterprising Nonprofit:* John Wiley &Sons: New York.

Drayton, W. (2002). The citizen sector: Becoming as entrepreneurial & competitive as business, *California Management Review*.

Elkington, J. (1994). Towards the sustainable corporation: Win-win-win business strategies for sustainable development. *California Management Review*, 36,(2), 90-100.

Hartigan, P. (2006). It's about people, not profits. *Business Strategy Review*, 17(4), 42-45. http://dx.doi.org/10.1111/j.0955-6419.2006.00433.x

Hockerts, N. K. (2007). Managerial Perceptions of the Business Case of Corporate Social Responsability, CSR&Business in Society CBS Working Paper Series no. 03-2007, CBS Center for Corporate Social Responsabiliy, Disertation no. 2750.

Korosec, R. L, & Berman, E. M. (2006). Municipal support for social entrepreneurship, *Public Administration Review*, 66(3), 448-462. http://dx.doi.org/10.1111/j.1540-6210.2006.00601.x

Kotler, P., & Lee, N. (2005). *Corporate Social Responsibility*. Doing the Most Good for Your Company & Your Cause, John Wiley & sons, Inc..

Leadbeater, C. (1997). *The rise of Social Entrepreneurship,* Demos.

Light, P. (2008). *The Search for Social Entrepreneurship*, Brookings Institution Press.

Mort, G. S., Weerawardena, J., & Carnegie, K. (2003). Social entrepreneurship: Towards conceptualization. *International Journal of Nonprofit and Voluntary Sector Marketing*, 8(1), 76-83. http://dx.doi.org/10.1002/nvsm.202

Nicholls, A. (2006) *Social entrepreneurship New model of Sustainable Change*, Oxford University Press.

Seitanidi, M. M., & Crane, A. (2008). Implementing CSR through partnerships: understanding the selection, design and institutionalisation of nonprofit-business partnerships. *Journal of Business Ethics*, 85(S2), 413-429. http://dx.doi.org/10.1007/s10551-008-9743-y

Tracey, P., Phillips, N., & Haugh, H. (2007). Beyond Philantropy: Community Enterprise as a Basis for Corporate Citizenship. *Journal of Business Ethics*, 58(4), 327-344. http://dx.doi.org/10.1007/s10551-004-6944-x

Waddock, S. (2004). Parallel Universes: Academics & the progress of Corporate Citezenship, *Business & Society Review*, 109, 5-42. http://dx.doi.org/10.1111/j.0045-3609.2004.00002.x

Wills, B. (2009). *Green Intentions Creating*, A Green Value Stream to Compete & Win, CRC Press Taylor & Francis Group.

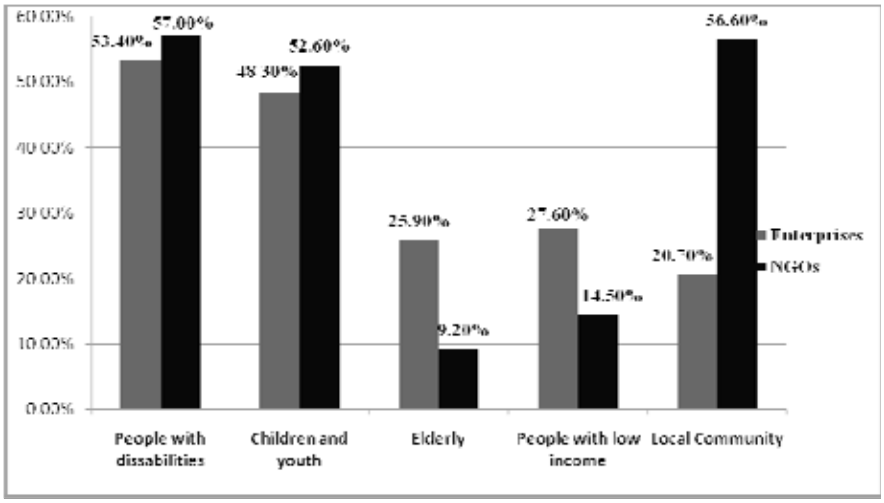

Figure 1. Main Groups Targeted by Firms and NGOs

Making a comparative analysis of the main groups targeted by firms and NGOs we observed that in the case of Peoples with disabilities and Children and youth the tendency is quite similar, these categories being of main interest for both targets. In the case of targets such as elderly and people with low income companies registered higher results that NGOs. A difference is seen in the case of local community were it comes first for NGO with a percentage of 56.60, compared with 20.70 for analyzed enterprises. This emphasizes the fact that companies from Cluj County have a more specialized approach than NGOs.

Investment and Expenditure on Innovation Activities and Innovative Capability: Empirical Evidence from Portuguese Services Firms and KIBS

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Abstract

This research aims to analyze the degree of importance of investment and expenditure on innovation activities for entrepreneurial innovative capability, in the scope of Portuguese services firms and the firms belonging to the KIBS - knowledge-intensive business services. A conceptual model was proposed and several research hypotheses were empirically tested using secondary data, belonging to the 5th CIS 2006, supervised by EUROSTAT. A data set from 829 KIBS firms was studied. The method used will be the logistic regression model. According to the results obtained, the greater the financial investment in acquisition of machinery, equipment and software, in internal research and development, in acquisition of external knowledge, in marketing activities and other procedures, the greater the propensity for firms to innovate in terms of services. This study highlights the contributions that innovation activities can provide in what regards the development of innovation process, giving special emphasis to their service innovation.

Keywords: Innovation, KIBS, Services, Innovative Capability, CIS

1. Introduction

The growing tendency of globalization and interdependency of economies is inferred in highly competitive and chaotic context for the firm. In this sense, it is of major relevance to analyse the determinant factors of innovative capability of firms in general and of service firms in particular, due to the great importance that these firms present in the economy of the countries. In fact, in the last decades there has been an evolution of the role of the services sector in the economy, not only due to the importance of this sector assumes in innovation, but also in the competitiveness, in job creation and in the economic growth (Hauknes, 1998; de Jong, Bruins, Dolfsma & Meijaard, 2003; Howells & Tether, 2004). A study carried out by The European Union regarding 25 countries, corroborates these facts since, in 2004, services sector firms, in average contribute 39,9% towards total employment and for 46,2% of value added (Arundel, Kanerva, Cruysen & Hollanders, 2007).

Taking in account the role carried out by the countries' service firms, the fact that some of these firms present a tendency towards innovation is becoming increasingly important since it is a fundamental competitive advantage in the sector (Tether, 2005). In such way, it is necessary to understand, among the innumerable factors that influence the innovative character of a service organization, which are the real relevant factors when stimulating the innovative capacity of a service firm, with the intention of adequately mobilizing the firms of the sector that seek innovation as a competitive advantage.

Gallouj (2002) stated that the studies which approach innovation in service firms suggest several factors that influence the innovative capacity of this type of firm. However, so that organizational actions and public policies are efficient, it is necessary to reduce the amount of factors to a set that actually represents a stimulus towards the innovative capacity of a service firm. But, among the innumerable factors, which are truly relevant?

Therefore, the aim of the present study is to identify, amongst a set of internal and external factors, those that influence the innovative capacity of service firms, namely: investments in innovation, entrepreneurial dimension, sector of activity, internationalization, external sources of information and the capacity to establish relationships and partnerships.

The present study aims to analyse the importance of the determinant internal and external factors of innovation capability of services firms. Factors previously analysed in other studies (Silva, 2003; Silva & Leitão, 2009), present a significant impact in the innovative capability in the sector of industrial firms however, at services level there is a need to identify and analyse which factors really stimulate or restrain entrepreneurial innovative capability.

This study has as reference the innovation in services approach, the services innovation approach and the reference approach regarding the innovation topic, where the systemic approach of innovation and the network and intraorganizational approach is emphasized. Considering this conceptual frame, hypotheses were formulated to test and analyse factors that limit the activity and the innovative performance of Portuguese services firms.

To empirically test the formulated hypothesis, secondary data provided by "OCES– Observatório da Ciência e do Ensino Superior" (Higher Education and Sciences Observatory), belonging to – Community Innovation Survey (CIS 2006) were used. This questionnaire was implemented under the supervision of EUROSTAT. The general linear regression model, namely the logistic regression model is applied.

The study is structured as follows: section two, provides relevant literature about the topic of innovation in services, a conceptual model is proposed and are formulated the hypotheses to be empirically tested in the statistical model. Section three defines the sample, the variables used in the empirical study are described and characterized and finally the logistic regression model is presented. In section four, the obtained results are discussed in the scope of the literature considered relevant. In the last section, the main concluding remarks as well as guidelines for futures research are presented.

2. Innovation in Services

According to Miles (2001), the literature about services has registered an intense evolution since the 60s. There has been a growing interest in the study of innovation in services. This is due to the fact that the service sector presents an above average growth (Segal-Horn, 2006; Sundbo, 2009), which concerns new firms, job creation and, still, the contribution of these firms towards development and generation of wealth for the region and countries. The service sector covers a wide range of activities with differing characteristics (Hauknes, 1998; Drejer, 2004; Hipp & Grupp, 2005; Miles, 2005; Vries, 2006). Sectors such as information technology, finance, transports and communication have been of major importance in the internal product of nations, either in developed countries or, in developing countries (Camacho & Rodriguez, 2005).

According to the Oslo Manual (OCDE, 2005), innovation in services is organized in a less formal way, it is less technological and is more incremental in nature. Sundbo & Gallouj (1998, 2000) divided the innovation in services into five categories: product innovation (a new product or new service which, when sold, involves service supply); process innovation (change in one or more procedures to produce or provide a service); organizational innovation (new form of management and organization); market (market changes such as, the discovery of previously non-existing segment ad hoc innovation (search of a solution towards a certain problem presented by a client).

Gallouj & Weinstein (1997) noticed that it is difficult to analyse innovation in the service sector due to two reasons, firstly, because innovation theories were developed under the scope of the study of technological innovation, in industrial firms and secondly because it is not easy to measure and detect changes in services, due to specific characteristics of their activities. The literature revision in the scope of innovation in service embraces three fundamental approaches: assimilation, demarcation and synthesis. (Haukens, 1998; Gallouj, 1998; Sundbo & Gallouj, 1998; Freeman & Louçã, 2001; Coombs & Miles, 2000; Howells, 2000, 2001; Gallouj, 2002; Howells, 2003; Howells & Tether, 2004; Drejer, 2004; Miles, 2005; Vries, 2006).

Studies with an assimilation/technologists approach view services from a manufacturing perspective. These studies are the most numerous and tend to focus on the impact of technology on services (Barras, 1986, 1990; Gallouj, 1998; Freeman & Louçã, 2001; Gallouj, 2002). Studies demarcation/ services-oriented approach start from the notion that services are distinctly different from manufacturing and that service innovation has features that requires new theories (Gallouj and Weinstein, 1997; Sundbo & Gallouj, 1998; Coombs & Miles, 2000) Studies synthesis/ integrative approach recognized that services innovation focuses attention on hitherto neglected elements of innovation, which are relevant to booth service and manufacturing (Coombs and Miles, 2000; Drejer, 2004; Miles, 2005; Vries, 2006).

These approaches show that innovation in services differs from innovation in products. According to Sundbo (1997) and Tether & Hipp (2002), the specific characteristics of services (intangibility, heterogeneity, perishability and simultaneously of production and consumption) differentiate them from physical products, bring difficulties and restrictions to imports of programs and management models related to innovation in the industrial sector. Such services have special features that require specific innovative models for the sector; somewhat still scarce in the literature (Barras 1986, 1990; Edgett, 1993; Gallouj, 1998, 2002; Pires, Sarkar & Carvalho, 2008).

Despite the absence felt by the researchers, during the last years, some studies show that the innovation in services leads towards a greater level of growth and dynamism of the economic activity (Sundbo, 1997; De Brentani, 2001). This is due to the entry barriers relatively low, the higher possibility of intangibility, and of achieving sustainable competitive advantages, such as it happens with physical goods (de Jong & Vermeulen, 2003; Oke, 2007; Toinonen & Tuominen, 2009).

During the last two decades, the deregulation and globalization of markets, as well as internationalization of service firms, originated severe competition between these firms (Elche e González, 2008). These trends set innovation in services in the heart, as a means of constant adaptation to a turbulent environment, which requires a continuous stream of new market offers (Stevens & Dimitriadis, 2005; Djellal & Gallouj, 2008).

The capability for innovating, at the level of services, is entitled entrepreneurial innovative capability. Therefore, the term entrepreneurial innovative capability was used in this study to integrate the several components that result from the innovative process of the services firm, namely service innovation, process innovation, organizational innovation and marketing innovation (OCDE, 2005). The study of entrepreneurial innovative capability at the services level is of major concern here. Thus the firm is considered innovative if "it introduced new or technologically improved service during 2004-2006" (CIS 2006, 3).

It is important to emphasize that the innovative capability varies from firm to firm and it is determined by a vast and complex number of factors, both propelling and confining of the innovative entrepreneurial process. The explanatory factors of innovation are not all considered in the factors referred here. However, there is an intention to analyse the process of innovation at an entrepreneurial level, considering the literature review of this study, the following factors are analysed: investment in innovation, regarding the formulation of research hypothesis is subsequently discussed.

The importance of investment and expenditure on innovation, within the firm, such as acquisition of machinery, equipment, software and external knowledge, is demonstrated in the studies of Mansfield (1988), Shields & Young (1994), Archibugi, Evangelista & Simonetti (1995), Weiss (2003), Camacho & Rodriguez (2005), Canopa & Stoneman (2008) and Elche & González (2008). According to these authors, the firms that make large investments in research and development, in improvement of structures and collaborator's skills, acquire a higher technological capability and consequently, have the capacity to produce more innovations. These authors argue that firms which

invest in better structures, technology and qualified staff indicate higher innovative capability. Thus, the following relation between investment and expenditure on innovation and the entrepreneurial innovative capability:

Hypothesis1: investment and expenditure on innovation activities is positively related to service firms' propensity to innovate in terms of products/ services

Based on the generic hypothesis related to investment and expenditure on innovation activities and to the typology presented in the Innovation Survey CIS 2006, the following seven specific hypotheses are formulated in this context:

H11: Carrying out internal R&D activities is positively related to service firms' propensity to innovate in terms of products/services.

H12: Carrying out external activities of R&D is positively related to service firms' propensity to innovate in terms of products/services.

H13: Acquisition of machinery, equipment and software is positively related to service firms' propensity to innovate in terms of products/services.

H14: Acquisition of other external knowledge is positively related to service firms' propensity to innovate in terms of products/services.

H15: Carrying out training is positively related to service firms' propensity to innovate in terms of products/services.

H16: Carrying out marketing activities is positively related to service firms' propensity to innovate in terms of products/services.

H17: Investment and expenditure in other procedures is positively related to service firms' propensity to innovate in terms of products/services.

3. Design Research

3.1 Data Presentation: Population and Sample

The data used in this research, are secondary data, collected through a survey that consisted in a questionnaire named as Community Innovation Survey 2006 – CIS 2006 between June and November 2005. In Portugal, the survey was conducted by OCES – Observatório da Ciência e do Ensino Superior (Higher Education and Sciences Observatory), in collaboration with INE – Instituto Nacional de Estatística (National Institute of Statistics), and concerning innovative activities of Portuguese companies during the period of 2002 to 2004.

The population contemplates all the services firms according to the classification of economic activities CAE – Rev. 2.1. (CAE, 2003). The initial sample was built by INE, according to EUROSTAT'S methodological specifications, and extracted from a population of 23 348 firms registered in FUE – Ficheiro de Unidades Estatísticas do INE (File of Statistical Unit of NSI). An initial sample of 7 730 firms was withdrawn from this population, which later was corrected to 6 482 firms. Regarding the considered sample, 4 815 firms replied to the questionnaire, therefore a 74.3% response rate (OCES, 2006). From the firms of the sample, only 809 firms belonging to the services sector, more are considered (Table 1).

Insert Table 1 Here

Thus, the firms of the KIBS sector will be considered as innovative in the services, if they introduce new or technologically improved services during the period 2002-2004.

3.2. Description and Data Characterization

In this study, the innovative capability is measured from the information collected at the level of service innovation, being considered as the dependent variable. This dimension is presented as a dichotomy variable binary-data based which adopts value 0 if the firm did not innovate and value 1 for those that innovated. With regard to these independent variables, they are represented in Table 2, summarizing variables and measures used for each factor operationalization of the model and later used to empirically test the formulated hypothesis in the proposed conceptual model (Table 2).

Insert Table 2 Here

3.3 Method: Logistic Regression Model

From the theoretical literature review and the proposed conceptual model, it was verified that the innovative capability of the firm is a complex phenomenon influenced by a wide range of factors. Since it is necessary to explore the relationship between these factors and the innovative capability, there is an intention to study, more

specifically, the statistical relationship of a dependent variable in relation to more than one explanatory variable; it was decided to use the Logistic Regression Model (Logit Model). In the dimension of the Innovative capability of the services, there is a correspondent regression model where the variable dependent is dichotomic, so according (Hair Jr., Babin, Money & Samouel, 2003) the adequate application model is the Logit regression model. This model, has been the most widely used in the empirical studies carried out (Silva, 2003), and is being presented as an appropriate analytical technique for t conceptual models proposed, since these include a dependent categorical variable (binary or dichotomic) and several independent variables, see table 2.

4. Data Analysis

In this research stage, logistic regression models were applied to the Community Innovation Survey, testing the proposed model. Wald statistic was used as the testing statistics to analyse the behavior of variables and the adjustment quality of the proposed model. The logistic regression results for the KIBS Innovation Model are presented in table 3 (Table 3).

Insert Table 3 Here

The logistic regression results for the model (table 3) show that not all regression parameter estimates are statistically significant at a level of 5%. Regarding adjustment quality of the model, the results show that the predictive capability of the model is of 85.6%, which result from the comparison between the values of the variable response values predicted by the model and those observed. The Chi-square statistic test has a value of 540.72 with proof value less than the significance level of 0.05. The log-likelihood statistics, with a value of 455.75, corroborates the global significance of the model.

Considering the hypothesis formulated it was possible to identify the existence of two no supported hypothesis. The hypothesis H12, regarding external activities of R&D, did not present statistical significance to the level of 0.05.

The hypothesis H14, is not supported at a significant level of 0.05. The results don't permit to conclude about the impact the Acquisition of other external knowledge have on innovation propensity of firms innovating at the product/services level.

Concerning the generic hypothesis H1, which aimed to test the effects of investment in innovation on innovative propensity in terms of product/services, a positive relationship with significance under 0.05 was found when a service firm makes investment in internal investigation and development activities (variable Adi1), acquisition of machinery, equipment and software (Adi3), Training (Adi5), in marketing activities (Adi6), and other procedures (Adi7), it presents a greater propensity to innovate in terms of services. Considering the results obtained and those presented in column Exp (B), it is observed that by investing in the training (8.734), and internal investment in innovation (4.105), as well as implementing marketing activities (2.731), and acquisition of machinery, equipment and software (2.397) and also other procedures for developing new products (1.855), service firms are seen to be more likely to innovate in terms of services. From the significance of the values obtained, the results show that investments in training and internal investment in innovation are those which stimulate the propensity for KIBS firms to innovate most.

5. Conclusions and Recommendations

The aim of this study was to analyze the degree of importance of investment and expenditure on innovation activities for entrepreneurial innovative capability, in the scope of Portuguese services firms and the firms belonging to the KIBS - knowledge-intensive business services. With the purpose of improving comprehension of innovation in services and identifying the main determinants of innovation in the service sector in the area of innovation activities, various hypotheses for investigation were formulated based on the literature review carried out of innovation in product/services. The literature review identified three fundamental approaches in the sphere of service innovation: assimilation, demarcation and synthesis.

This investigation highlights seven factors stimulating and limiting innovative capability in firm: Intramural (in-house) R&D; Extramural R&D; Acquisition of machinery, equipment and software; Acquisition of other external knowledge; Training; Adi6= Marketing activities; Other procedures. investment in innovation activities. It was in relation to these factors that the various hypotheses tested empirically were formulated.

According to the results obtained, some investments in innovation present positive and significant effects in service innovation; therefore, the greater the financial investment in acquisition of machinery, equipment and software, in internal research and development, in training, in marketing activities and other procedures, the greater the propensity for firms to innovate in terms of product/services. The analysis of the results obtained in the statistical analysis allows pointing out that, considering hypothesis, in the KIBS companies, it is possible to bear that innovation is rather a result of internal processes than the acquisition of external resources, this is due to internal

characteristic of the service.

The principle contribution of this research lies in inclusion in the study of factors determining the innovative capability of service firms, seeking to increase comprehension of innovation in services and identify the main factors stimulating innovation in this sector. The investigation proposed an empirical study based on a logit model, for joint analysis that provided measurement of the direct and indirect effects of a selected set of explanatory variables of the innovative capability of KIBS Portuguese companies.

The main limitations of this study arise from the limited data obtained, through lack of access to all the results of CIS 2006, for example, the number of employees per company. Nor was it possible to draw up a comparison of results, with previous CIS, so as to assess evolutionary tendencies in the area of innovation activities and expenditure.

To continue this investigation, in future work it is proposed to repeat the empirical study with data from other European countries where the Community Innovation Survey 2006– CIS 2006 was carried out. In addition, a new study will be developed with the proposed conceptual model, with the aim of contrasting empirically data from the Community Innovation Survey 2008 – CIS 2008. From this perspective, it is considered that repetition of the investigation in Europe, more precisely in countries that responded to the same questionnaires, could also enrich study of the phenomenon of entrepreneurial innovation, and specifically the approach to service sector innovation.

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References

Archibugi, D., Evangelista, R., & Simonetti, R. (1995). Concentration, firm size and innovation: evidence from innovation costs. *Technovation*, 15(3), 153-164. http://dx.doi.org/10.1016/0166-4972(95)96616-2

Arundel, A., Kanerva, M., Cruysen, A., & Hollanders, H. (2007). Innovation statistics for the European service sector, INNO Metrics report, Brussels: European Commission, DG Enterprise.

Barras, R. (1986). Towards a theory of innovation in services. *Research Policy*, 15(1), 161-173. http://dx.doi.org/10.1016/0048-7333(86)90012-0

Barras, R. (1990). Interactive innovation in financial and business services: The vanguard of the service revolution. *Research Policy*, 19(1), 215-237. http://dx.doi.org/10.1016/0048-7333(90)90037-7

CAE – Rev. 2.1 (2003). Classification of economic activities – rev. 2.1, Law nº 197, 27 August

Camacho, J., & Rodríguez, M. (2005). How innovative are services? An empirical analysis for Spain. *The Service Industries Journal*, 25(2), 253-271. http://dx.doi.org/10.1080/0264206042000305448

Canepa, A., & Stoneman, P. (2008). Financial constraints to innovation in the UK: evidence from CIS2 and CIS3. *Oxford Economic Papers*, 60(4), 711-731. http://dx.doi.org/10.1093/oep/gpm044

CIS 2006. (2007). Community Innovation Survey 4, Center for Science and Higher Education, Ministry of Science and Technology, Lisboa, Portugal.

Coombs, R., & Miles, I. (2000), 'Innovation, measurement and services: the new problematic', in JS Metcalfe and I. Miles (eds). *Innovation Systems in the Service Economy*: Measurement and Case Study Analysis, Boston, MA: Kluwer Academy Publisher, EUA. http://dx.doi.org/doi: 10.1016/S0148- 2963(01)00259-4.

De Brentani, U. (2001). Innovative versus incremental new business services: different keys for achieving success. *Journal of Product Innovation Management*, 18(1), 169-87. http://dx.doi.org/10.1016/S0737-6782(01)00071-6

De Jong, J., & Vermeulen, P. (2003). Organizing successful new service development: a literature review. *Management Decision*, 41(9), 844-858. http://dx.doi.org/10.1108/00251740310491706

De Jong, J., Bruins, A., Dolfsma, W., & Meijaard, J. (2003). Innovation in services firms explored: what, how and why?. EIM, *Business and Policy Research*, Zoetermeer.

Djellal, F., & Gallouj, F. (2007). Innovation and employment effects in services: a review of the literature and an agenda for research. *The Service Industries Journal*, 27(3), 193-214. http://dx.doi.org/10.1080/02642060701206959

Drejer, I. (2004). Identifying innovation in surveys of services: a schumpeterian perspective. *Research Policy*, 33(2), 551-562. http://dx.doi.org/10.1016/j.respol.2003.07.004

Edgett, S. (1993). Developing new financial services within U.K. building societies. *International Journal of Bank Marketing*, 11(3), 35-43. http://dx.doi.org/10.1108/02652329310027701

Elche, D., & González, Á. (2008). Influence of innovation on performance: analysis of Spanish service firms. *The Service Industries Journal*, 28(10), 1483-1499. http://dx.doi.org/10.1080/02642060802250294

Gallouj, F. (1998). Innovation in reverse: services and the reverse product cycle, Topical Paper, SI4S, Oslo: STEP Group

Gallouj, F. (2002). Innovation in services and the attendant old and new myths. *Journal of Socio-Economis*, 31(1), 137-154. http://dx.doi.org/10.1016/S1053-5357(01)00126-3

Gallouj, F., & Weinstein, O. (1997). Innovation in services. *Research Policy*, 26(3), 537-556. http://dx.doi.org/10.1016/S0048-7333(97)00030-9

Hair Jr., J. F., Babin, B., Money, A. H., & Samouel, P. (2003). Essentials of business research methods. New Jersey: John Wiley & Sons

Hauknes, J. (1998). Services in innovation, innovation in services, Synthesis Report, nº 1, SI4S, Oslo: STEP Group

Hipp, C., & Grupp, H. (2005). Innovation in the service sector: the demand for service-specific innovation measurement concepts and typologies. *Research Policy*, 34(3), 517-535. http://dx.doi.org/10.1016/j.respol.2005.03.002

Howells, J. (2000). Innovation & services: new conceptual frameworks. CRIC Discussion Paper, nº 38, CRIC, Manchester, UK

Howells, J. (2001). The nature of innovation in services. Innovation and Productivity in Services, OCDE, Paris, French, 55-79.

Howells, J. (2003). Innovation and services: the combinatorial role of services in the knowledge-based economy. International Conference on New Trends and Challenges of Science and Technological Innovation in a Critical Era, Taipei.

Howells, J., & Tether, B. (2004). Innovation in services: issues at stake and trends, Final Report, Commission of the European Communities, Brussels-Luxembourg.

Mansfield, E. (1988). The speed and cost of industrial innovation in Japan and the United States: external vs. internal technology. *Management Science*, 34(10), 1157-1168. http://dx.doi.org/10.1287/mnsc.34.10.1157

Miles, I. (2001). *Services innovation*: a reconfiguration of innovation studies. The University of Manchester (Discussion Paper Series), Manchester, UK.

Miles, I. (2005). Innovation in services, in Fagerberg, J., Mowery, R. and Nelson, R. (Ed.). *The Oxford handbook of innovation*, Oxford: Oxford University Press, 433-458. http://dx.doi.org/10.1093/oxfordhb/9780199286805.001.0001

OCDE. (2005). OSLO manual: proposed guidelines for collecting and interpreting technological innovation data, 3rd edition, Paris, French

OCES. (2006). Ministry Science and Technology, Center of Science and Higher Education, Summary Table of Results 4º Community Innovation Survey in Portugal, Lisbon.

Oke, A. (2007). Innovation types and innovation management practices in service companies. *International Journal of Operations & Production Management*, 27(6), 564-587. http://dx.doi.org/10.1108/01443570710750268

Pires, C., Sarkar, S., & Carvalho, L. (2008). Innovation in services: how different from manufacturing?. *The Service Industries Journal*, 28(10), 1339-1356. http://dx.doi.org/10.1080/02642060802317812

Segal-Horn, S. (2006). Strategy in service organizations, in Faukner, D. & Campbell, A. (Ed.). *Strategy: a strategy overview and competitive strategy*, Oxford, UK: University press, 472-506.

Shields, M., & Young, S. (1994). Managing innovation costs: a study of cost consciousness behavior by R&D professionals. *Journal of Management Accounting Research*, 6, 175-189.

Silva, M. (2003). Determinants factors of Entrepreneurial Innovation Capability of Industrial Firms in Portugal, Ph.D. Thesis in Management, University of Beira Interior, Covilhã.

Silva, M., & Leitão, J. (2009). Reinforcing the entrepreneurial innovation capacity of industrial SMES with networks, in Leitão, J. & Baptista, R. (Ed.). Public policies for fostering entrepreneurship: an European perspective, *International Studies in Entrepreneurship*, Vol. 22, Springer 1. http://dx.doi.org/10.1007/978-1-4410-0249-8_6.

Slater, S., & Narver, J. (1994). Market orientation, customer value, and superior performance. *Business Horizons*, 37, 22-28. http://dx.doi.org/10.1016/0007-6813(94)90029-9

Stevens, E., & Dimitriadis, S. (2005) Managing the new service development process: towards a systemic model. *European Journal of Marketing*, 39(1/2), 175-198. http://dx.doi.org/10.1108/03090560510572070

Sundbo, J. (1997). Management of innovation in services. *The Service Industries Journal*, 17(3), 432-445. http://dx.doi.org/10.1080/02642069700000028

Sundbo, J. (2009). Innovation in the experience economy: a taxonomy of innovation organizations. *The Service Industries Journal*, 29(4), 431-455. http://dx.doi.org/10.1080/02642060802283139

Sundbo, J., & Gallouj, F. (1998). Innovation in services, SI4S Synthesis Papers, Oslo: STEP Group.

Sundbo, J. & Gallouj, F. (2000). Innovation as a loosely coupled system in services. *International Journal of Services Technology and Management*, 12(1), 15-36. http://dx.doi.org/10.1504/IJSTM.2000.001565

Tether, B. (2005). Do Services Innovate (Differently)? Insights from the European Innobarometer Survey. *Industry and Innovation*, 12, 153–184. http://dx.doi.org/10.1080/13662710500087891

Vries, E. (2006). Innovation in services in networks of organizations and in the distribution of services. *Research Policy*, 35(5), 1037-1051. http://dx.doi.org/10.1016/j.respol.2006.05.006

Weiss, P. (2003). Adoption of product and process innovations in differentiated markets: the impact of competition. *Review of Industrial Organization*, 23, 301-314. http://dx.doi.org/10.1023/B:REIO.0000031372.79077.fc

Table 1. Classification of Services

Services typology	Activity services sector	NACE Codes	N
KIBS knowledge-intensive business services	Computer and related activities Research and Development	72-73	140
	Architectural and engineering activities Technical testing and analysis	74	689
	Total		829

Table 2. Variables of Model

Variables	Code	Measures	Codification
Innovation Product and Services	In	1= firms innovated in product/services 0= firms did not innovated in product/services	Dichotomy
Investments in Innovation	Adi	Investment and Expenditures in Innovation Activities: Intramural (in-house) R&D (Adi1) Extramural R&D (Adi2) Acquisition of machinery, equipment and software (Adi3) Acquisition of other external knowledge (Adi4) Training (Adi5) Marketing activities (Adi6) Other preparations (Adi7)	Binary: 1 = engage innovation activities 0 = not engage

Table 3. Logit Regression Model Results for Services Innovation

Model	Parameter Estimator	S.E.	Wald	Significance	EXP (B)
Innovation investments					
– Intramural (in-house) R&D (Adi1)	1.412	0.274	26.489	0.000	4.105
– Extramural R&D (Adi2)	-0.310	0.317	0.955	0.328	0.733
– Acquisition of machinery, equipment and software (Adi3)	0.874	0.330	7.023	0.008	2.397
– Acquisition of other external knowledge (Adi4)	0.355	0.229	1.409	0.235	1.426
– Training (Adi5)	2.167	0.330	43.131	0.000	8.734
– Marketing activities (Adi6)	1.0053	0.287	12.260	0.000	2.731
– Other preparations (Adi7)	0.618	0.292	4.467	0.000	1.855
Constant	-3.455	0.243	21.888	0.000	0.032
Model Summary					
Correct Predict (%)	85.6%				
Qui-square	540.72			0.000	
Log likelihood	455.75				
Number of cases	809				

Accounting Information, the Cost of Capital and Excess Stock Returns: The Role of Earnings Quality-Evidence from Panel Data

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Abstract

This paper investigates the impact of the firm's accounting information and, especially the role of earnings quality, on its cost of capital and how this influences excess returns. The analysis extends prior works by investigating how components of accounting information and, especially earnings quality, affect stock returns through their effect on the cost of capital. The empirical approach uses a sample of US manufacturing firms as well as the methodology of panel data. The empirical findings display that all components of accounting information affect the firm's cost of capital, which, in turn, exerts a negative effect on the firm's excess returns, an empirical documentation not captured in case that the analysis links directly the cost of capital and excess returns.

Keywords: Accounting information, Cost of capital, Excess returns, Earnings quality, US manufacturing, Panel data

1. Introduction

Recent research attempts in finance have established that asymmetric information poses risk to uninformed investors and, therefore, should be priced (Easley and O'Hara, 2004; Easley *et al*., 2002). According to this argument, uninformed traders bear trading costs from trading with insiders (Speigel and Subrahmanyam, 1992). Therefore, those uninformed traders require a premium to invest in risky assets when facing the prospect that they may be trading with informed traders in a multi-asset context where traders plan to diversify their holdings. Aboody and Lev (2000) argue that insiders of research and development intensive firms trade on private information, but without relating inside trading to the pricing of asymmetric information. Earnings quality is viewed as a broader measure of asymmetric information. Dow and Gorton (1995) provide an analysis that relies on restrictions on uninformed traders' ability to hold the market portfolio. Amihud and Mendelson (1986) argue that asymmetric information leads to higher transaction costs in the form of bid-ask spreads. Those spreads imply lower prices given that investors are interested in returns after transaction costs, while these costs cannot be diversified away. Baiman and Verrecchia (1996) link the cost of capital to public earnings disclosures and inside trading. Their findings show that although increased public disclosure reduces the cost of capital, it may also lead to less efficient production and compensation. In addition, Beneish and Vargus (2002) investigate the association between accruals and inside trading. Their results raise the question whether the accruals anomaly alone could be capable of accounting for the presence of

asymmetric information risk. Finally, Aboody *et al.* (2005) examine whether abnormal accruals can proxy for asymmetric information that affect the cost of capital. They find that earnings quality is indeed an important pricing factor for the value of firms.

This study, based on theoretical arguments claiming that information risk, i.e. the likelihood that information pertaining to a firm's environment is considered of poor quality by investors, is a non-diversifiable risk factor (Easley and O'Hara, 2004; Ecker *et al*., 2006), plans to examine how earnings quality affects investor's reliance on the above link. Firms with poor earnings quality have higher costs of capital. The ultimate objective is to increase the extent that managers' private information for future profitability is impounded in financial aggregates, such as stock prices. In addition, regulator's interest on management discussion and analysis sections in the annual reports is growing responding to the global consensus that narrative communication is the step forward in improving the quality of corporate reporting. Managers may release overly optimistic views about their firm's earnings to maximize the value of their stock options and thus to reduce the likelihood of bankruptcy or hostile takeovers or even to reduce the cost of new equity capital. Therefore, viewing earnings quality as a proxy for the credibility of the earnings signal emanating from the financial statements, this study will investigate whether investors assess the quality of reported earnings to infer the credibility of their disclosures. Such disclosures refer to information on current plans and forecasts that enable shareholders, investors and financial analysts to assess a firm's financial performance (especially, for the future). It mainly involves risks and uncertainties that could have a negative impact on actual results and cause them to deviate significantly from expected results.

Prior research efforts have shown that the ability of the stock market to anticipate future earnings is positively associated with the number of disclosed statements in annual reports (Hussainey *et al.*, 2003).When it comes to investors, earnings quality becomes an important signal of management's credibility. Analytical research provides conflicting predictions about how earnings quality affects the firm's excess stock returns. A research avenue argues that firms with poor earnings quality issue more expansive disclosures as information asymmetry is greater for these firms (Verrecchia, 1983). By contrast, other research attempts focus on the endogenous nature of disclosures and show that firms with good earnings quality provide more expansive disclosures as they possess higher quality insider information and investors regard their disclosures as more credible (Dye, 1985; Verrecchia, 1990).

The goal of this paper is to empirically investigate the impact of the firm's accounting information and particularly the role of earnings quality as a part of accounting information, on its cost of capital as well as how the latter influences excess or abnormal returns. This analysis followed in this paper has certain novelties: First, it extends prior works, as the above, on the issue by investigating how earnings quality and other components of accounting information affect stock prices through their direct effect on the cost of capital, second, it makes use of a large sample of US manufacturing firms, while it makes use, for the first time in this literature, of the methodology of panel data to investigate the above effect. There are at least three factors contributing to the extensive growth of panel data estimations: data availability, greater capacity for modeling the complexity of economic and financial trends, e.g. controlling the impact of omitted variables and uncovering dynamic relationships, than single cross-section or time series data estimations and challenging methodology (Baltagi, 2001; Hsiao, 2003). A key novel feature of this research design is that it accommodates the role of earnings quality as a part of accounting information to investigate, for the first time, its impact on the link between the cost of capital and excess stock returns.

The findings should be of interest to managers, market participants, policy makers and regulators. For managers the results should recommend that there is a benefit to maintaining a high quality reporting system, i.e. when firms report high quality profits, the market is highly responsive to information included in the annual reports. This is also of interest to individual investors and analysts in assessing the potential risks involved when relying on such disclosures. The results should also be relevant for policy makers and regulators. The greatest risk that regulators face is that managers may make self-serving disclosures and mislead investors. Investors mitigate such risk by conditioning their reliance on the firm's reported earnings quality. Finally, the results should be extensively important for the literature of accounting choice, i.e. the research on financial reporting and disclosure choices as well as capital market consequences. In particular, both financial reporting and disclosure strategies are driven by the firm's information environment, managerial incentives and corporate financing. These choices also interact, inducing investors to extract useful information from earnings quality. By shedding light on these interactive effects and their consequances for investor decision making, the empirical findings should highlight the need for examining the firm's policies not in isolation but as a part of a general reporting and disclosure equilibrium.

The remainder of this paper is organized as follows. Section 2 discusses explicitly the role of earnings quality in the literature of stock markets, while Section 3 discusses the data used along with methodological issues and the

construction of earnings quality measurement. Section 4 presents the empirical analysis, while Section 5 concludes the paper and provides some policy implications and suggestions for further research.

2. The Role of Earnings Quality for Stock Markets

Recent studies make use information from both sides of the balance sheet, i.e. assets and liabilities, to assess the value-relevance of accounting information for stock prices (Ohlson, 1995). Previous works have also examined such link through the concept of market liquidity. In particular, studies by Baiman and Verrecchia (1996) and Easley and O'Hara (2004) suggest an indirect link between accounting information and the firm's cost of capital based on market liquidity and adverse selection.

Many studies have attempted to address directly the impact of information accounting on stock prices, both for the cases of the US and the UK and for various global capital markets (Beaver *et al*., 1979; Amir *et al.*, 1993; Barth and Clinch, 1996; Chan and Seow, 1996; Graham and King, 1998). Others have focused on examining the link between stock returns and earnings for various US firms (Collins, *et al.*, 1989; Hayn, 1995), while Barth *et al.* (1998) and Burgstaher and Dichev (1997) give emphasis on the joint role of assets and liabilities, in addition to earnings, for the course of stock prices. Alford *et al.* (1993) applies this analysis for firms outside in the US and particularly in Ausralia, France, the Netherlands and the UK. Their results reach the same conclusions.

Whether investors rely on the quality of reported earnings to assess the credibility of their announcements depends on how earnings quality affects the likelihood of such disclosures in the annual reports. Verrecchia (1983) argues that firms with poor earnings quality face higher information asymmetry and, thus, issue more expansive disclosures as the incremental value of such disclosures is greater for these firms. Managers would need to operate a high quality reporting system to be able to provide disclosures that investors would view as credible. Verrecchia (1990) proposes that high information quality implies a lower threshold level and, thus, a higher likelihood of such disclosures, as investors would treat such disclosures as more credible. The rationale here is that as earnings quality increases, the market exerts more pressure to managers to disclose information by discounting the firm's value if information is withheld. This implies a positive association between such disclosures and earnings quality. Verrecchia (1990) also notes for this point that such a positive association may not be unequivocal, due to the indirect effect of the quality of disclosures. In other words, higher quality information can reduce the market uncertainty and, thus, the incremental value of disclosures and their probability, consistent with a substitute association. Fama and French (1996) also argue that firms with high magnitudes of earnings quality, measured as signed abnormal accruals, earn positive risk-adjusted returns and vice verasa. Their results receive statistical support by Chan *et al.* (2001) and Xie (2001). Cohen (2003) explores the impact of exogenous variables on reporting quality as well as on its economic implications. He provides evidence in favor of the fact that reporting quality has significant effects on the cost of equity capital.

Empirical attempts probing the association between disclosures and earnings quality provide evidence consistent with both a substitutive and a complementary relation, depending on the disclosure and earnings quality strategy chosen. Francis *et al.* (2008) find a complementary association between the disclosure score and earnings quality. When focusing on the score component relating to the firm's projected information, they find no evidence of a significant association with earnings quality. Imhoff (1978) finds that firms issuing earnings forecasts have less volatile earnings than non-forecast firms. Waymire (1985) argues that firms issuing earnings forecasts more frequently have less volatile earnings relative to firms issuing such projections on an infrequent basis. Lang and Lundholm (1993) find that firms' ratings are decreasing in the correlation between earnings and returns, a finding that is consistent with firms with less informative financial statements providing additional disclosures. In the same fashion, Finally, Demers and Vega (2009) find that net optimism detected in soft information that managers disclose in earnings announcement is priced more for firms with lower quality accounting data, a finding that is consistent with net optimism substituting for poor earnings quality.

3. Data

The firm level data sample covers a selected group of US firms. Our sample (based on quarterly data) comes from Bloomberg and Compustat. In case those firms have missing values for any of our variables under investigation are dropped. As a result, 2830 firms have been employed spanning the period January 1990-June 2009, yielding a total of 56600 observations. Variables such as the beta risk factor (b), the book value (bv) and earnings per share (eps) are used to proxy accounting information with respect to equity cost of capital, while variables such as financial leverages (flev) and interest coverage (intcov) are used to proxy accounting information with respect to debt cost of capital. Financial leverage is measured as the firm's ratio of interest-bearing debt to total assets, while interest coverage is measured as the fir,'s ratio of operating income to interest expenses. Finally, stock prices (p) are also obtained. This data set is also obtained from Bloomberg. For the empirical goals of the analysis the weighted cost of

capital was calculated through equation (1) described above. To this end, data on the cost of long-term debt, the firm's marginal income tax rate, the cost of common stock, and the weights of long-term debt and common stock in the firm's capital structure, are also obtained from Bloomberg. When determining the weights of debt and equity, we use their market values rather than book values for reasons mentioned above. Data on the three-month T-bills rate (rf) was also obtained from Bloomberg. In this manner, excess returns (er) are calculated simply by substracting rf from percentage differences in stock prices. Finally, the RATS (version 6.1) software assists the empirical analysis.

3.1 Measures of Earnings Quality

Our four proxies for earnings quality (EQ) are recommended by the accounting literature (Francis *et al.*, 2002). The first two measures are variants based on Jones' (1991) separation of accruals into a normal component that can be justified by sales and investments and an abnormal component. We will also use the unsigned magnitude of abnormal accruals as a measurement of earnings quality. Thus, the third and fourth measures of earnings quality are based on Dechow and Dichev's (2002) model of working capital accruals that separate total working capital accruals into an explained portion correlated with past, current or future cash flows and an abnormal portion. Then, earnings quality measures are derived from the unsigned magnitude of abnormal working capital accruals. The above four definitions are measures of the precision of public disclosure. In other words, higher quality means higher precision of public disclosure, implying less remaining private information from which privately informed traders exctract gains. Francis *et al.* (2002) find that the first two measures are negatively correlated to anticipated stock returns.

For the empirical purposes of this study four earnings quality measures are employed from Aboody *et al.* (2005). All four measures rely on accounting fundamentals to the separate accruals into non-discretionary (normal) and discretionary (abnormal) components. Earnings quality is defined as the absolute value of the abnormal component. The larger the absolute value, the lower is earnings quality. In particular, total accruals (TA), total current accruals (TCA) and cash flows (CFs) for each firm j and year t are calculated as follows:

$$TA_{jt} = \Delta CAS_{jt} - \Delta CL_{jt} - \Delta CASH_{jt} + \Delta STDEBT_{jt} - DEPN_{jt}$$

$$TCA_{jt} = \Delta CAS_{jt} - \Delta CL_{jt} - \Delta CASH_{jt} + \Delta STDEBT_{jt}$$

$$CF_{jt} = NIBE_{jt} - TA_{jt}$$

where:

TA = total accruals, TCA = total current accruals, CF = cash flows from operation, CAS = current assets, CL = current liabilities, CASH = cash, STDEBT = short-term debt, DEPN = depreciation expenses, NIBE = net income before extraordinary items and Δ = changes from year t-1 to year t. To estimate abnormal total accruals, the following regression is performed:

$$TA_{jt}/Asset_{j(t-1)} = a_1\ 1/Asset_{j(t-1)} + a_2\ \Delta REV_{jt}/Asset_{j(t-1)} + a_3\ PPE_{jt}/Asset_{j(t-1)} + \varepsilon_{jt}$$

where:

Asset = total assets, REV = revenues, PPE = gross value of property, plant and equipment and ε is a residual term. Next, we make use of the above parameter estimates to get normal accruals (NA) as:

$$NA_{jt} = \hat{a}_1\ 1/Asset_{j(t-1)} + \hat{a}_2\ (\Delta REV_{jt}-\Delta AR_{jt})/Asset_{j(t-1)} + \hat{a}_3\ PPE_{jt}/Asset_{j(t-1)}$$

where: ΔAR = accounts receivable. Finally, abnormal accruals (AA) are defined as:

$AA_{jt} = TA_{jt}/Asset_{j(t-1)} - NA_{jt}$. The absolute value of abnormal accruals is the first measure of earnings quality, let be EQ1, with larger values indicating lower earnings quality.

Next, similar to total accruals, we can estimate abnormal current accruals using the following regression:

$$TCA_{jt}/Asset_{j(t-1)} = c_1\ 1/Asset_{j(t-1)} + c_2\ \Delta REV_{jt}/Asset_{j(t-1)} + \eta_{jt}$$

where: η = a residual term. Again, we make use of the above coefficient estimates to calculate normal current accruals:

$$NCA_{jt} = \hat{c}_1\ 1/Asset_{j(t-1)} + \hat{c}_2\ (\Delta REV_{jt}-\Delta AR_{jt})/Asset_{j(t-1)}$$

and we calculate the abnormal component as:

$ACA_{jt} = TCA_{jt}/Asset_{j(t-1)} - NCA_{jt}$. The absolute value of the abnormal current accruals is the second measure of earnings quality, let it be EQ2. Similarly, larger values of EQ2 imply poorer earnings quality.

To get the third measure of earnings quality we make use estimates of total current accruals based on cash flows from operations:

$$TCA_{jt}/AvAsset_{jt} = g_0 + g_1\ CF_{j(t-1)}/AvAsset_{jt} + g_2\ CF_{jt}/AvAsset_{jt} + g_3\ CF_{j(t+1)}/AvAsset_{jt} + \theta_{jt} \quad (4)$$

where: AvAsset = average total asset over years t-1 and t and θ = a residual term. The absolute value of residuals θ is the third definition of earnings quality, let it be EQ3, while the time-series standard deviation of those residuals is the fourth definition of earnings quality, let it be EQ4. By the same standards, larger absolute residuals and larger standard deviations of residuals imply lower earnings quality.

4. Empirical Analysis

4.1 Panel Unit Root Tests

At the outset, the statistical properties of value added, the capital stock, labor and depreciation expenses are examined by testing for the presence of unit roots. There are a variety of panel unit root tests, which include Maddala and Wu (1999), Hadri (2000), Levin *et al.* (LLC, 2002) and Im *et al.* (IPS, 2003).

The results in Table 1 point out that the hypothesis that all the variables, except the weighted cost of capital (wacc), the earnings per share ratio (eps) and excess returns (er), under study contain a unit root is accepted at the 1% significant level in all tests, suggesting that these variables are I(1), while the variables wacc, wacc1, wacc2, wacc3, wacc4, TA/Asset, ΔREV/Asset, PPE/Asset, TCA/Asset, TCA/AvAsset, CF/AvAsset, EQ1, EQ2, EQ3 and EQ4 are I(0). These findings reject the presence of cointegation.

Insert Table 1 Here

4.2 Dynamic Heterogeneity

An issue that it is of major concern is the heterogeneity of the firms included in this data set. In particular, through time and across firms, the effects of accounting information–wacc relationship as well as that of the wacc-excess stock returns relationship. In the statistical framework of this study we first test for heterogeneity and then by controlling for it through appropriate techniques (Holtz-Eakin, 1986; Holtz *et al*., 1985). The dynamic heterogeneity, i.e. variation of the intercept over firms and time, across a cross-section of the relevant variables can be investigated as follows. In the first step, an ADF (n) equation for each relationship in the panel is estimated; then, the hypothesis of whether regression parameters are equal across these equations is tested. Next, a similar test of parameter equality is performed by estimating a n-order autoregressive model for each of the relationships under investigation. Standard Chow-type F tests under the null of parameter equality across all relationships are also performed. Heterogeneity in cross-sectional parameters is indicated if the results reject the null hypothesis. Finally, homogeneity error variance across groups is also examined as another measure of dynamic heterogeneity. White's tests for group-wise heteroscedasticity are employed to serve this objective. The results of this procedure are reported in Table 2. In all specifications the empirical findings indicate that the relationships under investigation are characterized by heterogeneity of dynamics and error variance across groups, supporting the employment of panel analysis.

Insert Table 2 Here

4.3 Panel Regression Estimates

The first part of this sub-section reports the estimates of equations (2), (3) and (4). A classic problem in such estimations is the simultaneous equation bias and the identification problem. A solution to this problem, recommended by Arellano and Bond (1991), is to exploit the orthogonality that is present between the lagged values of the dependent variable and the error term. This procedure makes use of lagged differences and lagged levels beyond t-2 as instruments for the lagged dependent variable. The orthogonality or 'exogeneity' of the instrument set can be tested using the GMM-J-statistic to compute the familiar Sargan (1958) test. In particular, these estimates for equation (2) –the estimates for normal accruals- yield:

$$NA_{jt} = -0.662\ \Delta(1/Asset_{j(t-1)}) + 0.036\ (\Delta REV_{jt}-\Delta AR_{jt})/Asset_{j(t-1)} + 0.027\ PPE_{jt}/Asset_{j(t-1)}$$

$$(-12.4)^* \qquad (15.66)^* \quad (8.28)^*$$

$$R\text{-bar}^2 = 0.48\ LM=1.55[0.36]\ RESET=2.76[0.38]\ HE=1.42[0.38]\ J\text{-test} = 34.56[0.00]$$

Figures in parentheses denote t-statistics, while those in brackets denote p-values. LM is a serial correlation for the residuals test, RESET is a model specification test, HE is a heteroskedasticity test, J-test is the Sargan instruments validity test and an asterisk denotes statistical significance at 1%. The estimates for equation (3) –the estimates for normal current accruals- yield:

$$NCA_{jt} = 0.329\ \Delta(1/Asset_{j(t-1)}) + 0.024\ (\Delta REV_{jt}-\Delta AR_{jt})/Asset_{j(t-1)}$$

$$(18.7)^* \quad (20.8)^*$$

$$R\text{-bar}^2 = 0.74\ LM=1.32[0.30]\ RESET=2.47[0.31]\ HE=1.49[0.42]\ J\text{-test} = 37.23[0.00]$$

Finally, the estimates of equation (4) –the estimates of total current accruals based on cash flows- yield:

$$TCA_{jt}/AvAsset_{jt} = 0.012 - 0.055\ CF_{j(t-1)}/AvAsset_{jt} + 0.083\ CF_{jt}/AvAsset_{jt} -$$
$$(3.71)^* \quad (-5.52)^* \quad (6.78)^*$$
$$0.089\ CF_{j(t+1)}/AvAsset_{jt}$$
$$(-14.2)^*$$
$$R\text{-bar}^2 = 0.45\ LM=1.21[0.22]\ RESET=2.41[0.32]\ HE=1.45[0.39]\ J\text{-test} = 39.06[0.00]$$

Table 3 reports a correlation matrix based on Spearman and Pearson correlation tests. The correlation findings display that the first two measures, EQ1 and EQ2 –based on both tests- have a very strong correlation between them. Although the correlations between EQ3 and EQ4 are lower than before, they still display a high association between them. These findings could be an indication that the first two measures capture similar things about the structure of a firm, a characteristic that seems to be weaker for the remaining two measures.

Insert Table 3 Here

The fixed-effect panel relationship between cost of capital, beta, book value, earnings per share, the price earings ratio, financial leverage, interest coverage and earnings quality is specified as follows:

$$wacc_{jt} = \alpha_{jt} + \beta_{1j}\ \Delta b_{jt} + \beta_{2j}\ \Delta bv_{jt} + \beta_{3j}\ eps_{jt} + \beta_{4j}\ flev_{jt} + \beta_{5j}\ intcov_{jt} + \beta_{6j}\ EQ_{jt} + \varepsilon_{jt}$$

where j=1,…,N for each firm in the panel and t=1,…,T refers to the time period. Book values are considered important elements in reavealing substantial accounting information, especially for the future course of earnings (Burgstahler and Dichev, 1997). The importance of earnings-per-share measurement of earnings has been also exemplified for the accounting information value relevance (Ramakrishnan and Thomas, 1998). This type of information seems to be extremely important for capital market investors.

Table 4 displays the estimation results. The first panel displays the effect of the variable combosing the accounting information concept on wacc. In this model the coefficients are shown to have the expected signs, while they are all statistically significant at the one percent significance level. Looking at the model's overall performance, as reported by a battery of diagnostic tests, the estimated equation satisfies certain econometric criteria, namely absence of serial correlation (LM test), absence of functional misspecification (RESET test) and absence of heteroskedasticity (HE test). Focusing on the altenative measures of earnings quality we can infer that all four measures, given the interpretation provided above, exert a negative and statistically significant effect on the cost of capital. We interpret these findings as indicating that as the quality of earnings announcemtns decreases, so does the amount investors are willing to pay for a dollar of earnings, implying a higher cost of capital for firms with lower-quality earnings announcements.

Insert Table 4 Here

Once these estimations are available, the estimated wacc is saved. Next, Table 4 presents two versions of the panel data model that associates the estimated cost of capital and excess stock returns. In particular, the second panel displays the effect of the cost of capital on excess stock returns directly from the actual data and without taking into consideration any other accounting information. The results indicate that there exists a positive, albeit statistically insignificant, association between these two variables, which of course is in dispute. Once again, the performance of the model does not indicate any statistical anomaly. By contrast, in the third panel, the estimated cost of capital, i.e. the fitted values of wacc from the first panel of Table 4, which incorporates directly certain amounts of accounting information, is used and it is shown that it exerts a negative and statistically significant impact on excess stock returns. Four versions of this model are reported, associated with the four alternative earnings quality measures. The statistical performance of these models also displays a satisfactory picture. In all four versions the cost of capital exerts a negative impact on excess returns. This time, however, the explanatory performance in all four cases has extensively risen, from 0.39 to 0.53-0.89. In addition, the size influence of the cost of capital on excess returns has also increased, implying that the components of accounting information tend to reveal an extensive component of accounting information, relevant to the stock market.

5. Conclusions and Implications

This paper showed empirically the links between accounting information, cost of capital and excess stock returns for a sample of 330 US manufacturing firms and the panel data methodological approach over the period 1990-2009. The empirical findings displayed that accounting information, as it is proxied by certain variables closely associated with each firm, affects directly the firm's cost of capital. This, in turn, implies that by incorporating all available pieces of information related to the accounting environment of the firm, tends to exert a negative effect on the firm's excess stock returns, an empirical documentation not captured in case that researchers attempt to direct link the cost of capital and excess stock returns. A possible explanation is based on the arguments that improved accounting

information tends to affect the firm's real decisions. As a result, investors can assess better the future potential course of the firm, which has a direct effect on the future course of the firm's stock price.

With respect to earnings quality, the results lent support to the fact that asymmetric information poses risk to uninformed investors and should be reflected in the cost of capital. Moreover, the results also suggested the notion, popular both in the accounting literature and on Wall Street, that earnings have different 'qualities', has a great amount of truth to it. In other words, the fact that discretionary accruals, as a measure of earnings quality, imply that such quality measures are important proxies for firms' information environment. Therefore, our empirical findings indicate that investors cannot fully unravel discretionary accruals and such discretion serves to reduce the effectiveness of public earnings announcements as a device for resolving asymmetric information risk and mitigating gains to insiders that define that risk.

The above empirical findings have important implications for researchers, managers and policy makers. For researchers imply that an asset-pricing model without the earnings announcement quality factor not fully specified induces misspecification bias on the estimated coefficients and the empirical results turn out to be invalid. For managers they provide insights into the strategies they could follow to increase the extent to which stock prices impound their private information. If managers maintain a high quality reporting system, investors are more responsive to their disclosures performance. Thus, the empirical findings suggest that investors mitigate the risk of resource misallocation by conditioning their reliance on quality disclosures, i.e. on the firm's reported earnings quality, as well as on managerial incentives and corporate financing. Moreover, managers compensated with stock options have serious incentives to increase the degree of volatility during the expected time they are holding those stock options. According to the view that considers the firm's cost of capital as a proxy for return volatility, such stock options are a major incentive for managers to take actions leading to a higher cost of capital. In addition, the regulatory authorities have to make mandatory the disclosure of more accounting information, thus, leading to lower market risk premia and higher stock prices. Moreover, the results could also be taken seriously into consideration by practitioners, as a mean for better evaluation of accounting policies. Thus, various groups who are involved in this accounting system, as accountants, auditors and regulators and their goal is to improve to a great extent the quality of accounting information, should find those efficient mechanisms that will enable them to transmit such information to final investors and to disclose all possible information that will assist the entire system to lead to potential crises periods.

Finally, the implications of our empirical findings also extend the research on accounting choices. Shedding light on the interrelations between disclosures and reporting quality, between managerial incentives and the firms' information environment, and between financing on these choices and investor's decision making, it highlights the need for future research to examine firms' choises not in isolation, but as a part of a general reporting and disclosure equilibrium.

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References

Aboody, D., Hughes, J., & Liu, J. (2005). Earnings Quality, Insider Trading, and Cost of Capital. *Journal of Accounting Research*, 43, 651-673.

Aboody, D., & Lev, B. (2000). Information Asymmetry, R&D and Insider Gains. *Journal of Finance*, 55(6), 2747-2766.

Alford, A., Jones, J., Leftwish, R., & Zmijewski, M. (1993). The Relative Informativeness of Accounting Disclosures in Different Countries. *Journal of Accounting Research*, 31, 183-223. http://dx.doi.org/10.2307/2491170

Amihud, Y., & Mendelson, H. (1986). Asset Pricing and the Bid-Ask Spread. *Journal of Financial Economics*, 17, 223-249. http://dx.doi.org/10.1016/0304-405X(86)90065-6

Amir, E., Harris, T., & Venuti, E. (1993). A Comparison of the Value-Relevance of US versus non-US GAAP Accounting Measures Using Form 20-F Reconciliations. *Journal of Accounting Research*, 31, 230-264. http://dx.doi.org/10.2307/2491172

Arellano, M., & Bond, S. (1991). Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations. *Review of Economics Studies*, 58, 277-297. http://dx.doi.org/10.2307/2297968

Baiman, S., & Verrecchia, R. (1996). The Relation Among Capital markets, Financial Disclosure, Production Efficiency, and Insider Trading. *Journal of Accounting Research*, 34, 1-22. http://dx.doi.org/10.2307/2491329

Baltagi, B. H. (2001). *Econometric Analysis of Panel Data, 2nd Edition*. New York: Wiley.

Barth, M. E., & Clinch, G. (1996). International Accounting Differences and Their Relation to Share Prices: Evidence from UK, Australian, and Canadian Firms. *Contemporary Accounting Research*, 13, 135-170. http://dx.doi.org/10.1111/j.1911-3846.1996.tb00495.x

Beaver, W. H., & Landsman, W. R. (1998). Relative Valuation Roles of equity Book Value and Net Income as a Function of Financial Health. *Journal of Accounting and Economics*, 25, 1-34. http://dx.doi.org/10.1016/S0165-4101(98)00017-2

Beaver, W., Clarke, R., & Wright, W. (1979). The Association Between Unsystematic Security Returns and the Magnitude of Earnings Forecast Errors. *Journal of Accounting Research*, 17, 316-340. http://dx.doi.org/10.2307/2490507

Beneish, M., & Vargus, M. (2002). Insider Trading, Earnings Quality and Accrual Mispricing. *The Accounting Review*, 77, 755-793. http://dx.doi.org/10.2308/accr.2002.77.4.755

Burgstahler, D., & Dichev, I. (1997). Earnings, Adaptations and Equity Value. *The Accounting Review*, 187-215.

Chan, K. C., Chan, L., Jegadesh, N., & Lakonishok, J. (2001). Accruals Quality and Stock Returns; The Evidence from Accruals. *Working Paper, National Taiwan University and University of Illinois.*

Chan, K. C., & Seow, G. S. (1996). The Association Between Stock Returns and Foreign GAAP Earnings Versus Earnings Adjusted to US GAAP. *Journal of Accounting Economics*, 21, 139-158. http://dx.doi.org/10.1016/0165-4101(95)00405-X

Cohen, D. (2003). Quality of Financial Reporting Choice: Determinants and Economic Consequences. *Working Paper, Northwestern University.*

Collins, D., Kothari, S., & Rayburn, J. (1989). An Analysis of Intertemporal and Cross- Sectional Determinants of Earnings Response Coefficients. *Journal of Accounting and Economics*, 11, 143-181. http://dx.doi.org/10.1016/0165-4101(89)90004-9

Dechow, P., & Dichev, I. (2002). The Quality of Accruals and Earnings: The Role of Accrual Estimation Errors. *The Accounting Review*, 11, 35-59. http://dx.doi.org/10.2308/accr.2002.77.s-1.35

Demers, E., & Vega, C. (2009). Soft Information in Earnings Announcements: News or Noise?. Working Paper at SSRN: http://ssrn.com/abstract=1153450.

Dow, J., & Gorton, G. (1995). Profitable Informed Trading in a Simple General Equilibrium Model of Asset Pricing. *Journal of Economic Theory*, 67, 327-369. http://dx.doi.org/10.1006/jeth.1995.1077

Dye, R. (1985). Disclosure of Non-Proprietary Information. *Journal of Accounting Research*, 23, 123-145. http://dx.doi.org/10.2307/2490910

Easley, D., & O'Hara, M. (2004). Information and the Cost of Capital. *Journal of Finance*, 59, 1553-1589. http://dx.doi.org/10.1111/j.1540-6261.2004.00672.x

Easley, D., Hvidkjaer, S., & O'Hara, M. (2002). Is Information Risk a Determinant of Asset Returns?. *Journal of Finance*, 57, 2185-2221. http://dx.doi.org/10.1111/1540-6261.00493

Ecker, F., Francis, J., Kim, I., Olsson, P. M., & Schipper, K. (2006). A Returns-Based Representation of Earnings Quality. *The Accounting Review*, 81, 749-780. http://dx.doi.org/10.2308/accr.2006.81.4.749

Fama, E., & French, K. (1996), Multifactor Explanations of Asset Pricing Anomalies. *Journal of Finance*, 51, 55-84. http://dx.doi.org/10.2307/2329302

Francis, J., Nanda, D., & Olsson, P. (2008). Voluntary Disclosure, Earnings Quality and the Cost of Capital. *Journal of Accounting Research*, 46, 53-99. http://dx.doi.org/10.1111/j.1475-679X.2008.00267.x

LaFond, R., Olsson, P., & Schipper, K. (2002). The Market Pricing of Earnings Quality. Working Paper, Duke University.

Graham, R., & King, R. (1998). The Relation of Firm Market Values with Book Values and Residual Accounting Earnings in Six asian Countries. *Working Paper*, *Oregon State University.*

Hadri, K. (2000). Testing for Stationarity in Heterogeneous Panel Data. *Econometric Journal*, 3, 148-161. http://dx.doi.org/10.1111/1368-423X.00043

Hayn, C. (1995). The Information Content of Losses. *Journal of Accounting and Economics*, 20, 125-153.

Holtz-Eakin, D. (1986). Testing for Individual Effects in Dynamic Models Using Panel Data. *NBER Technical Paper Series"*, No. 57.

Newey, W., & Rosen, H. (1985). Implementing Causality Tests with Panel Data with an Example from Local Public Finance. *NBER Technical Working Paper*, No. 48.

Hsiao, C. (2003). *Analysis of Panel Data, 2nd Edition*. Cambridge: Cambridge University Press. http://dx.doi.org/10.1017/CBO9780511754203

Hussainey, K., Schleicher, T., & Walker, M. (2003). Undertaking Large-Scale Disclosure Studies when AIMR-FAF Ratings are not Available: The Case of Prices Leading Earnings. *Accounting and Business Research*, 33, 275-294.

Im, K. S., Pesaran, M. H., & Shin, Y. (2003). Testing for Unit Roots in Heterogeneous Panels. *Journal of Econometrics*, 115, 53-74.

Imhoff, E. (1978). The Representativeness of Management Earnings Forecasts. *The Accounting Review*, 53, 836-850. http://dx.doi.org/10.1016/S0304-4076(03)00092-7

Jones, J. (1991). Earnings Management During Import Relief Investigation. *Journal of Accounting Research*, 29, 193-228. http://dx.doi.org/10.2307/2491047

Lang, M., & Lundholm, R. (1993). Cross-Sectional Determinants of Analyst Ratings of Corporate Disclosures. *Journal of Accounting Research*, 31, 246-271. http://dx.doi.org/10.2307/2491273

Levin, R., Lin, C. F., & Chu, C. (2002). Unit Root Tests in Panel Data: Asymptotic and Finite-Sample Properties. *Journal of Econometrics*, 108, 1-24. http://dx.doi.org/10.1016/S0304-4076(01)00098-7

Maddala, G. S., & Wu, S. (1999). A Comparative Study of Unit Root Tests with Panel Data and a New Simple Test. *Oxford Bulleting of Economics and Statistics*, 61, 631-652. http://dx.doi.org/10.1111/1468-0084.61.s1.13

Ohlson, J. (1995). Earnings, Book alues, and Dividends in Equity Valuation. *Contemporary Accounting Research*, 661-687. http://dx.doi.org/10.1111/j.1911-3846.1995.tb00461.x

Ramakrishnan, R., & Thomas, J. (1998). Valuation of Permanent, Transitory, and Price-Irrelevant Components of Reported Earnings. *Journal of Accounting, Auditing and Finance*, 13, 301-336.

Sargan, J. D. (1958). The Estimation of Economic Relationships Using Instrumental Variables. *Econometrica,* 26**,** 393-415. http://dx.doi.org/10.2307/1907619

Spiegel, M., & Subrahmanyam, A. (1992). Informed Speculation and Hedging in a Non-Competitive Securities Market. *Review of Financial Studies*, 5, 307-330. http://dx.doi.org/10.1093/rfs/5.2.307

Verrecchia, R. E. (1990). Information Quality and Discretionary Disclosure. *Journal of Accounting and Economics*, 12, 365-380. http://dx.doi.org/10.1016/0165-4101(90)90021-U

Verrecchia, R. E. (1983). Discretionary Disclosure. *Journal of Accounting and Economics*, 5, 179-194. http://dx.doi.org/10.1016/0165-4101(83)90011-3

Waymire, G. (1985). Earnings Volatility and Voluntary Management Forecast Disclosures. *Journal of Accounting Research*, 23, 268-295. http://dx.doi.org/10.2307/2490919

Xie, H. (2001). The Mispricing of Abnormal Accruals. *The Accounting Review*, 76, 357-373. http://dx.doi.org/10.2308/accr.2001.76.3.357

Table 1. Panel Unit Root Tests

IPS Panel Unit Root Tests		
Variables	Without Trend	With Trend
b	-1.47(3)	-1.68(3)
Δb	-5.11(2)*	- 5.41(1)*
er	-5.10(2)*	-5.57(2)*
bv	-1.25(3)	-1.47(3)
Δbv	-5.07(2)*	-5.38(2)*
eps	-5.43(2)*	-5.86(3)*
flev	-1.67(3)	-1.84(3)
Δflev	-4.87(2)*	-5.11(2)*
intcov	-1.63(3)	-1.92(3)
Δintcov	-4.51(2)*	-4.94(2)*
TA/Asset	-5.43(3)*	-5.68(3)*
1/Asset	-1.19(4)	-1.42(3)
Δ(1/Asset)	-4.76(2)*	-4.93(2)*
ΔREV/Asset	-4.78(3)*	-5.23(2)*
PPE/Asset	-4.52(3)*	-5.03(2)*
TCA/Asset	-4.61(3)*	-4.88(2)*
TCA/AvAsset	-4.49(2)*	-4.71(2)*
CF/AvAsset	-4.74(2)*	-5.11(2)*
EQ1	-5.23(2)*	-5.48(1)*
EQ2	-4.89(1)*	-5.18(1)*
EQ3	-4.33(2)*	-4.61(2)*
EQ4	-4.39(1)*	-4.73(1)*
wacc	-5.09(2)*	-5.33(2)*
wacc1 (EQ1)	-4.85(2)*	-5.13(1)*
wacc2 (EQ2)	-4.92(2)*	-5.22(1)*
wacc3 (EQ3)	-5.10(1)*	-5.31(1)*
wacc4 (EQ4)	-4.73(2)*	-4.93(1)*

LLC Panel Unit Root Tests	
Variables	With Trend
b	-1.32
Δb	-9.53*
er	-8.75*
bv	-1.62
Δbv	-9.37*
eps	-4.73*
flev	-1.72
Δflev	-4.71*
intcov	-1.50
Δintcov	-4.48*
TA/Asset	-8.33*
1/Asset	-1.34
Δ(1/Asset)	-6.93*
ΔREV/Asset	-7.18*
PPE/Asset	-7.26*
TCA/Asset	-6.31*
TCA/AvAsset	-6.40*
CF/AvAsset	-5.54*
EQ1	-6.73*
EQ2	-8.29*
EQ3	-6.32*
EQ4	-6.55*
wacc	-7.68*

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wacc1 (EQ1)	-6.89*
wacc2 (EQ2)	-6.90*
wacc3 (EQ3)	-7.24*
wacc4 (EQ4)	-7.14*

Handri (hom) Panel Unit Root Tests

Variables	With Trend
b	11.27*
Δb	1.35
er	1.17
bv	19.85*
Δbv	1.13
eps	1.26
flev	1.83
Δflev	4.55*
intcov	1.82
Δintcov	4.83*
TA/Asset	1.21
1/Asset	18.25*
Δ(1/Asset)	1.13
ΔREV/Asset	1.48
PPE/Asset	1.16
TCA/Asset	1.52
TCA/AvAsset	1.23
CF/AvAsset	1.14
EQ1	1.12
EQ2	1.32
EQ3	1.06
EQ4	1.15
wacc	1.44
wacc1 (EQ1)	1.37
wacc2 (EQ2)	1.18
wacc3 (EQ3)	1.25
wacc4 (EQ4)	1.21

Handri (het) Panel Unit Root Tests

Variables	With Trend
b	8.48*
Δb	0.62
er	1.77
bv	18.36*
Δbv	1.47
eps	1.54
flev	1.64
Δflev	4.56*
intcov	1.56
Δintcov	4.81*
TA/Asset	1.13
1/Asset	10.95*
Δ(1/Asset)	1.03
ΔREV/Asset	1.16
PPE/Asset	1.41
TCA/Asset	1.15
TCA/AvAsset	1.23
CF/AvAsset	1.24
EQ1	0.78

EQ2	0.84
EQ3	1.02
EQ4	0.83
wacc	1.18
wacc1 (EQ1)	1.23
wacc2 (EQ2)	0.91
wacc3 (EQ3)	1.14
wacc4 (EQ4)	1.52
Fisher-ADF	
Variables	
b	15.68
Δb	94.55*
er	118.33*
bv	21.23
Δbv	131.98*
eps	164.95*
flev	31.09
Δflev	152.84*
intcov	28.58
Δintcov	164.90*
TA/Asset	131.10*
1/Asset	11.15
Δ(1/Asset)	132.23*
ΔREV/Asset	125.41*
PPE/Asset	145.64*
TCA/Asset	133.12*
TCA/AvAsset	128.94*
CF/AvAsset	126.74*
EQ1	136.29*
EQ2	130.20*
EQ3	121.76*
EQ4	137.15*
wacc	141.23*
wacc1 (EQ1)	137.66*
wacc2 (EQ2)	141.58*
wacc3 (EQ3)	141.84*
wacc4 (EQ4)	138.19*
Fisher-PP	
Variables	
b	21.26
Δb	132.48*
er	147.89*
bv	25.48
Δbv	142.18*
eps	154.81*
flev	24.93
Δflev	144.07*
intcov	31.83
Δintcov	167.18*
TA/Asset	145.77*
1/Asset	10.14
Δ(1/Asset)	122.67*
ΔREV/Asset	129.81*
PPE/Asset	142.07*

TCA/Asset	131.66*
TCA/AvAsset	132.84*
CF/AvAsset	129.85*
EQ1	134.19*
EQ2	138.44*
EQ3	128.57*
EQ4	133.22*
wacc	141.15*
wacc1 (EQ1)	132.96*
wacc2 (EQ2)	145.82*
wacc3 (EQ3)	134.69*
wacc4 (EQ4)	133.44*

Numbers in parentheses are the augmented lags included in the unit root test, while Δ denotes first differences.* denotes statistical significance at 1%

Table 2. Tests of Dynamic Heterogeneity Across Groups

Specification	ADF(3)	AR(3)	White's Test
wacc-Δb-Δbv-eps-Δflev-Δintcov-EQ1	35.02*	41.55*	69.63*
wacc-Δb-Δbv-eps- Δflev-Δintcov-EQ2	37.54*	44.72*	8.31*
wacc-Δb-Δbv-eps- Δflev-Δintcov-EQ3	38.11*	45.43*	76.82*
wacc-Δb-Δbv-eps- Δflev-Δintcov-EQ4	31.12*	40.42*	63.46*
er-wacc	27.09*	30.14*	61.74*
er-wacc1 (EQ1)	29.49*	37.88*	66.53*
er-wacc1 (EQ2)	35.77*	40.91*	70.23*
er-wacc1 (EQ3)	32.05*	36.55*	67.81*
er-wacc1 (EQ4)	34.64*	38.82*	68.77*

ADF(3) reports the parameter equality test (F-test) across all relationships in the panel. AR(3) displays the F-test of parameter equality conducted in a third-order autoregressive model of the relationships. White's test reports the White's test of equality of variances across the investigated relationships in the panel. Δ denotes first differences. * denotes statistical significance at 1%.

Table 3. Correlations Among Earnings-Quality Measures

	EQ1	EQ2	EQ3	EQ4
EQ1		0.68	0.42	0.37
EQ2	0.72		0.45	0.40
EQ3	0.44	0.48		0.27
EQ4	0.39	0.41	0.30	

Spearman correlations are above diagonal, while Pearson correlations are below diagonal

Table 4. Panel (Fixed Effects) Regression Estimates

Cost of Capital and Accounting Information

$wacc1_{jt} = 0.46 + 0.199\ \Delta b_{jt} - 0.114\ \Delta bv_{jt} - 0.054\ eps_{jt} + 0.078\ flev - 0.126\ intcov - 0.207\ EQ1_{jt}$

(40.9)* (23.2)*(-11.9)* (-10.6)* (7.66)* (-5.87)* (-8.11)*

$R\text{-bar}^2 = 0.78$ LM=1.34[0.43] RESET=2.01[0.21] HE=1.33[0.37] J-test = 28.99[0.00]

$wacc2_{jt} = 0.45 + 0.198\ \Delta b_{jt} - 0.116\ \Delta bv_{jt} - 0.053\ eps_{jt} + 0.061\ flev - 0.078\ intcov - 0.268\ EQ2_{jt}$

(39.9)* (22.9)*(-11.4)* (-10.5)* (8.12)* (-6.08)* (-7.93)*

$R\text{-bar}^2 = 0.76$ LM=1.31[0.41] RESET=2.19[0.24] HE=1.23[0.32] J-test = 35.24[0.00]

$wacc3_{jt} = 0.47 + 0.212\ \Delta b_{jt} - 0.097\ \Delta bv_{jt} - 0.055\ eps_{jt} + 0.065\ flev - 0.092\ intcov - 0.175\ EQ3_{jt}$

(45.6)* (25.6)*(-11.1)* (-11.7)* (5.94)* (-5.18)* (-6.49)*

$R\text{-bar}^2 = 0.64$ LM=1.16[0.32] RESET=2.44[0.36] HE=1.12[0.27] J-test = 31.25[0.00]

$wacc4_{jt} = 0.46 + 0.211\ \Delta b_{jt} - 0.072\ \Delta bv_{jt} - 0.054\ eps_{jt} + 0.056\ flev - 0.101\ intcov - 0.249\ EQ4_{jt}$

(45.4)* (25.5)*(-10.8)* (-11.9)* (6.95)* (-5.83)* (-4.12)*

$R\text{-bar}^2 = 0.66$ LM=1.34[0.37] RESET=2.12[0.24] HE=1.37[0.35] J-test = 28.11[0.00]

Stock Prices and Cost of Capital (Direct Approach)

er = 0.044 + 0.095 wacc

(1.27) (1.36)

$R\text{-bar}^2 = 0.39$ LM=1.55[0.48] RESET=2.06[0.22] HE=1.78[0.39] J-test = 30.48[0.00]

Stock Prices and Cost of Capital (Indirect Approach through Accounting Information)

er1 = 2.114 - 0.497 wacc1

(2.44)* (-7.01)*

$R\text{-bar}^2 = 0.89$ LM=1.29[0.34] RESET=2.53[0.31] HE=1.28[0.33] J-test = 36.46[0.00]

er2 = 2.112 - 0.467 wacc2

(2.43)* (-6.62)*

$R\text{-bar}^2 = 0.86$ LM=1.33[0.36] RESET=2.63[0.36] HE=1.45[0.39] J-test = 33.47[0.00]

er3 = 2.089 - 0.459 wacc3

(2.39)* (-5.79)*

$R\text{-bar}^2 = 0.56$ LM=1.03[0.21] RESET=2.11[0.19] HE=1.22[0.27] J-test = 28.41[0.00]

er4 = 3.075 - 0.452 wacc4

(2.49)* (-5.74)*

$R\text{-bar}^2 = 0.53$ LM=1.10[0.24] RESET=2.13[0.20] HE=1.27[0.29] J-test = 32.55[0.00]

t-statistics are reported in parentheses, while p-values are reported in brackets. LM is a serial correlation for the residuals test, RESET is a model specification test, HE is a heteroskedasticity test and J-test is the Sargan's instruments validity test. Δ denotes first differences. * denotes significance at 1%.

Innovation Strategy for Business to Business Market Penetration

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Abstract

Strategies must align innovation capabilities to foster business model, since it mediates between the technology and the economic platforms domain. Here we consider the elements influential to technology innovation process in the context of a business to business technology-driven enterprise, considered within the perspective of technology maturity and organizational life cycle. The study subject was the Operacional Têxtil Ltda, a Brazilian textile systems automation enterprise, serving Latin-American textile industrial market. Main conclusions indicate the enterprise could be (a) an innovative business process generator and make this the leading strategy to compete; (b) an innovative product launcher and make this the leading strategy to compete; and/or (c) a technology-driven innovator using this strategy to improve market penetration.

Keywords: Innovation, B2B strategy, Marketing strategy, Technology-driven enterprise, Technology strategy

1. Introduction

Next generation enterprises, as posed by Jonash; Sommerlatte (1999), are under extreme pressure by today's hypercompetitive market. As effective competitive strategies depend on a firm's innovation capabilities, enterprises need to know where, or on what capabilities to invest to guarantee competition power in their operating environment. The endeavor to build core competences seems to be the obvious way. Nonetheless, the majority of enterprises, especially technology-driven enterprises (TDE), find it hard to identify what elements should be dealt with to establish the best corporate strategy. Obviously, success does not depend essentially on managing organizational key processes, but on how to sustain innovation – either in product or in business.

In a TDE environment, success depends on a coherent management of processes that lead to innovation. Executives have been trapped by the obsession of focusing the development of innovation without considering capabilities aligned to structures, context and organizational maturity as a whole. To identify and to introduce processes that combine key factor of success and technology innovation one needs to understand the organizational technology maturity cycle and the importance of market acceptance standards. Not perceiving these elements or barely understanding their role could lead to processes not congruent with corporate strategy, weakening effectiveness decreasing corporate competitive edge.

A winning corporate strategy requires considering the best way to consolidate especial capabilities contingent to the balance between product technology innovation and business technology innovation (Jonash; Sommerlate, 1999). Innovation in each way is distinctive and possesses specific requirements. For instance, if a technology-driven enterprise is in the verge of mass production, it should focus on business technology innovation, not necessarily on product innovation (Kampas, 2003). This is key to entrepreneurs and executives to boost direction and effectiveness to

corporate strategy. In the same context, corporate strategy will be effective only if it optimizes capabilities and resources available within the corporation.

To creating competence in business, through technology domain, would assure innovation capacity to corporations that "became an unavoidable need" if they want to succeed (Prahalad; Ramaswamy, 2003, p.12). It is not about adherence to traditional prescriptive strategies, such as cost reduction, efficient management, organization and control, re-engineering and outsourcing. It is essentially a way of generating value. And value in the one hand, is innovation by definition. If technology influences business in nearly all formats and all activities, on the other hand, innovation turns to be the strategy that supports continuous and profitable growth, independently of the business nature.

To expand market participation, besides considering strategies between the spectrum of premium price and low prices scaling up production strategies, B2B technology-driven enterprises need to know what and where the traps of a workable innovation strategy are. Using innovation to support corporate strategy to market penetration pushes the former to a higher level of importance in the process of building internal effective strategies. It seems obvious that innovation strategy becomes key to effective corporate strategies, requiring careful consideration of the process of technology innovation. The understanding of the nature and mechanics of this process is essential to support the logistics to carry effective B2B strategy market penetration.

1.1 Objectives

Our target here is to identify and discuss, using a selected technology-driven enterprise, the process of technology innovation in product and in business, in the context of organizational maturity. The study is carried out examining the nature and the process of organizational ripeness that curbs the development of basic competences in the corporation. As a result we propose a representative model to product and business innovation processes. The model combines stages of organizational maturity with preferred focus on innovation to orient the appropriate strategy formulation.

2. Methodology

The method used to carry out this study was the case study method. We explore in the case the process according to which is observed and analyzed. Yin (2005) would point this approach as to look for the how, in the phenomenon. The central social subject of the research was the founder and executive president of the enterprise Operacional Textil Ltda (OT). We also interviewed two senior employees, both system analysts, who have been with the company since its inception. Their contribution confirmed the company's historical trajectory described by the executive president and the meaning of observed behavior in the routine processes of OT.

The social subject of this research is Operacional Têxtil Ltda., a textile systems automation enterprise. OT's IT systems are to integrate management and manufacturing tasks at textiles companies. OT was established about 25 years ago and became a major player in this sector, in South America. Its payroll sums up over 120 employees from which, two thirds are technical specialists, such as textile technologists, IT programmers and systems analysts. OT first main system was the Dyeing Management System (DMS), a system dedicated to integrate and automate textile dyeing operations. Small, medium textile enterprises first adopted DMS. Lately, the system, improved and expanded in terms of its functions, was relaunched as Textile Management Systems (TMS), a system involving textile and management operations, business intelligence and costumer relations. Big players in the textile industry sector, such as Vicunha Textil, currently the major textile company in South America, and one of the biggest in the world, adopted TMS as its central integrated management and manufacturing system. OT holds two subsidiaries in South America: one in Argentina and another one in Peru. The enterprise also carries on a vast portfolio of clients and strategic alliances with multinational corporations dedicated to build or share common IT solutions. Among important strategic allies, OT counts with J.D. Edwards, that historically has helped OT find the best set of integrated solutions, combining production and administrative operations. We choose OT as the social subject of this research because it fits the basic requirements that we stated for this study, which means, the subject should operate in the Business to Business market, be a technology-driven enterprise, and operate in the international market.

This case study involves the history of Operacional Textil from its inception. It is divided into three major phases: (a) the early years; at the time when OT launched the main system, the Dyeing Management System; (b) the consolidation years, by the time when OT launched the Textile Management System; and (c) the recent years, a latter period, when OT begins to expand to international market. The data were collected through interviewing OT's owner and the main executives. Also OT's internal documents were accessed.

3. An Applied Theoretical Basis

Enterprises in general, and more typically, technology-driven enterprises present highly distinctive standards in life cycle, according to experts such as Adizes (1999); Greiner (1986). Adizes, for instance, describes nine stages of structural development in the life cycle of an enterprise. Stages involve infantry, adolescence, maturity, aristocracy,

bureaucracy and death. Adizes argues that maturity and senescence of an enterprise is linked to the relationship between adoption consolidation of rules and flexibility. As the organization matures, rules and formal procedures tend to increase and determine the types of internal structures are likely to consolidate. Rules limits power distribution and determine the format of the decision making process. An organization reaches maturity when it achieves a stable equilibrium between rules and flexibility among constituent areas.

Bernhoeft's (1997) perspective, however, is the organizational maturity as result of successful relationships established with market. The maturing stages are: creation, survival, success, growth and maturity. In each stage is driven by market hurdles that influence the maturity process. Maturity is reached as the organization builds a solid architecture of internal capabilities and external market relationships. So, everything in the organization is aligned to the needs of the organization's market relationship.

Greiner (1986) points out that the organization's life cycle are inflection points resulting from internal crises. That is, organization gets mature after successive internal crises. The nature of each crisis typifies the organization's stage of development. Each one leads to a new development stage. Greiner identifies five types of crisis and similar corresponding growth cycles. A leadership crisis, for instance, leading to a growth by orientation, would happen in small organizations, while a bureaucracy crisis, supporting growth by collaboration, would happen in established middle or big organizations. Another way of looking at this issue, especially on technology-driven enterprises, is applying Hruby's (1999) rationale of product technology maturing process. Hruby simplifies the organizations' life cycles into three stages only: beginning, normative and mass production. The beginning is chaotic and explorative. It is disciplined by the next stage, the normative, where norms rule the organizational dynamics, leading to a structural equilibrium and allowing for stable mass production stage.

In spite of specificities, the authors perspectives are clearly linked to each other. The rationale for establishing the stages seems to basically be the same, that is, the equilibrium between organizational flexibility and ruling. In Figure 1 Hruby's organizational life cycle for a technology-driven enterprise supports the rationale for the distinct phases in the evolution of the innovation process, either in product technology, or in business technology. Next we discuss each stage and its associated traps, proposing at the end, a representative model.

3.1 Product Technology Evolution

Any technology product holds a singular life cycle. Hruby (1999, p.15) points to four stages for a new product technology. At the launching, the new product or technology may be unique. It becomes subsequently an exotic, then, a specialty, and finally, a commodity as the technology matures in time and evolves through incremental improvements and distinct advances in applications. This cycle represents the spectrum of technological application.

Hruby (1999) defines the **unique** product is a singular solution for a specific problem. It is handcrafted (there is no standard process to build it), based on technologies in state-of-the-art. An **exotic** product is like the unique, but still in the early stages of a serial production. As **specialty** the product is known and accepted by the market, but still in the stage of limited production. And finally, as a **commodity** the product is accepted by the market and produced in massive scale. In contrast with the earliest stages, sold under a premium price policy, as a commodity the product competes in lower price. The profit contribution margin of the product shrinks as it evolves from the unique to the commodity stages. In the unique and the exotic phases, the technology embedded in the product faces almost no competition, or because it still didn't attract much attention from market and competitors, or because it is complex and hard to be reproduced. In the specialty and commodity phases, however, market standards of acceptance are established. As the product penetrates market, it enlarges opportunities, by chance, to be copied and to have technology reproduced.

3.2 Ways of Technology Development

Technology-driven enterprises need a permanent innovation platform. To build an effective innovation platform it is necessary to master the continuous changes in the clients' demand environment, that means, to become an ambidextrous organization (Reinmoeller; Baardwijk, 2005). Ambidexterity refers to external environment adaptation and internal alignment. Regarding corporate environment, Kampas (2003) asserts that external adaptation and internal alignment must be in consensus with cultural premises of the enterprise. Thus, to respond to client needs and demands one must to convene structure, resources, capabilities and cultural patterns in the organization. Adaptation without proper cultural premises consideration may lead to business failure (Kampas, 2003).

Changing cultural behavior in organizations depend on changes in individual believes and values, too. Schein (2004) assures that changing people's cultural behavior in an organization means to align individual premises and values to cultural norms. But culture in an organization is highly influenced by factors affecting the specific organizational life cycle. Therefore, to change its own culture, a technology-driven enterprise needs to know in what evolution stage it

stands. Kampas (2003) observes that cultural standards are related to the product development phases. For instance, specific type of cultural standards stipulates the dynamics and influence performance as the organization matures and becomes contingent to rules and regulations. Knowing and considering such patterns, thus, it is essential to formulate corporate strategies and stimulate product and business innovation. It is fairly logic, therefore, to understand that enterprises, where cultural norms influence scale production, tend to perform below acceptable in product innovation if they are scaling up production. Obviously, the inverse is also true, that is, enterprises where cultural norms are less influential in product manufacturing, stand more open and tend to be more innovative, either in product or in business innovation.

4. Results - Maturing Stages and Traps

Based on the expert literature, we analyze the organizational maturing stages and implications for the innovation process in the context of B2B. The analysis of each maturing stage shows the type of challenges one must face and the kind of associated traps that must be consider to handling efficiently the process of innovation. To do so, we here consider the evolution of Operacional Textil, to illustrate the stages, traps and the resulting arrangements for innovation.

4.1 The Beginning Stage

The beginning is the creation stage. The enterprise becomes a fact, through the launching of a new product or system. At its earlier times, enterprises expend a huge effort trying to put out a unique, state-of-the-art product. Normally they do so by jumping into a market opportunity, which give them a significant competitive advantage. Evans (2002) asserts that at this stage, endeavors are mostly focused on product engineering development or production processes. This was the case at OT. In OT's earlier years, people were free to work their own way to find the best and fastest solution to build the Dyeing Management System. DMS should respond to the needs of dyeing automation to textile industry. Individual freedom and the dynamics of specific needs lead organizational climate close to chaos. At this point, the focus was possible applications of DMS and market penetration.

The first idea was to develop DMS with applications for spinning, dyeing, knitting and woven fabrics processes, all at once. But sooner they perceived that focusing on one application would be more efficient. Dyeing management was the chosen focus. Five people were directly involved in designing, programming and testing the new software. As Mr. Krieck, a textile technician and OT's entrepreneur puts it:

In the affair to simplify processes and get results, there was a great deal of divergence, among almost everything, from programming language to help routines. There was also high pressure, from early adopter to customize solutions that increased conflicts because of diversified ways to have them solved...

Pressures for customization required answers that no specialist was able to find alone. Interaction would be the best way. Analysts, developers and programmers found more efficient technologies by socializing knowledge, even if apparently they give the impression of getting low effectiveness and productivity in the processes. The climate was individualistic, though. Not infrequently, conflicts spurred up, demonstrating a typical anarchist managerial model. Each professional focused his/her responsibilities and functions to develop the system. On the top of it, cultural norms were still not strong enough to curb individual behaviors.

Survival needs lead OT's strategy to stimulate breakthroughs to build the system, in order to cut time to market and to decrease development costs. OT's survival depended on a new crunch of technology domain. Market responses, however, demanded for expanded applications of DMS. OT decided to relaunch the system as Textile Management System (TMS), now adding other textile production (spinning, knitting, etc.) and administrative (business intelligence, e-procurement and others) functions.

Considering market responses, this period was valuable to adjust and increase TMS the market acceptance. Some of OT's most important clients, which were willing to pay the price for the novelty, used the system and pointed main inefficiencies. Most of them were related to the administrative functions, such as purchasing, human resources management and the likes.

At first, OT sought partnership and strategic alliances with other small enterprises, to accelerate the system development. OT could then rapidly incorporate administrative subsystems, such as accounting, financial, human resources and others. As OT expanded TMS applications, it faced problems in the internal structure. Needs for the system development, conflicts of power (groups and individual conflicts) and lack of formal rules, begun to shake the effectiveness of OT's business model. On the top of this, some of OT's partners started to sell separately the system modules developed in partnership with OT, undermining the market for the product as a whole. Clearly, cracks came to show in OT's business model.

OT stopped doing new alliances and imposed serious restrictions to the current ones. In fact, OT decided to run the development risks and incorporate all costs for developing the system by itself. The target then was to put out a system resembling an enterprise resources planning, specialized in the textile industry.

When the basic features of TMS were incorporated, market showed signs of acceptance. OT was discerning with success the set of basic characteristics that TMS should hold to be accepted by industry and, in turn, to be produced as a commodity. At that point, basic processes also needed to be standardized. To operate under standard processes OT's internal structure and business model needed to be changed too.

4.1.1 Traps in the Beginning stage

The first stage of life cycle of a technology-driven enterprise appropriates the best environment for technology development. Evans (2002) and Christensen et al. (2002), suggest further that technology-driven enterprises must pursue disruptive or radical technological innovation to sustain business. At OT people were working hard on radical technologies to maintain OT's as an innovative business. The apparent chaos and internal disorder at OT resulted from a planned organizational flexibility in its earlier stage. The main trap in this context would be to take the natural organizational flexibility, as the necessary organizational behavior. Organizational flexibility can and must be controllable, to be effective. The main reason is that, in spite of being contingent to innovation, flexibility can turn into a conflicting factor if not appropriately used. As a conflict cause, flexibility can decrease productivity, increase operating costs and decrease general performance of the organization. Therefore, the flexibility trap must be prevented and voided through a conscious pattern of planned control.

4.1.2 Interpreting Traps of the Beginning Stage

In the first life cycle stage organizations present a low market performance with a preferred focus on product development. Admissibly OT in this stage was in a low market performance situation because of the incipience of the enterprise. Not all attributes of the system, say, functionality, performance, compatibility and the likes, were complete and in place, to match textile industry needs. At the same time, standard processes to scale up TMS manufacturing were still not implanted. So, production costs were significantly higher than in a normal (scale up) production condition. Limitations on the product's spectrum of attributes (performance, compatibility, design, price, quality, assurance and the like) were partially compensated by the uniqueness of the system. Even so, it was not enough for immediate market acceptance and so uniqueness only could not guarantee OT's survival. Market penetration, therefore, was vital to OT, but it depends on the other system features. Thus, efforts should be concentrated on the system features and its ability to solve specific textile problems. OT's strategy was to stimulating creativity and divergence to develop a system that could better integrate administrative and production functions. To supply the strategy requirements, a flexible environment was necessary. And so, to avoid the flexibility trap of the first stage, OT needed to maintain the equilibrium between flexibility and ruling (the standardization process).

4.2 Normative Stage

As market acceptance increases, so increase requisites for scaling up, that is, increase the needs for standardization. Enterprises focus on organizing internal processes, determine workload priorities, standardize processes to decrease costs, increase productivity and expand market share. There is a good deal of investment in time and energy to set up appropriate rules and procedures to align activities and processes with the organization overall strategy. Under a managerial perspective, standardization would guarantee a more equalitarian distribution of power and a better circumscription of the limits regarding managers' responsibilities.

At OT, the normative stage begins when market established the basic set of standard features that the system should hold. Since the first clients required integration of functions for the system, OT focused on increasing integration of the system modules (first the modules for production and then the administrative modules). Besides the system features, a main challenge for OT was to develop the integration of its own processes to optimize its capabilities. Mr. Krieck expressed these challenges, pointing that:

I didn't know that we, at OT, were in another stage that required first internal adjustments, before going out and compromising with our clients. Clients wanted quick answers and these [answers] required specific processes, for example, channeling quick to the right group or expert, to solve the problem…

OT was gradually favoring standardization of internal processes. As OT incorporated in the TMS new features demanded by market (the first system's features grew from four or five to a more than ninety distinct applications, in the current TMS), those features required internal processes to speed operating processes and increase market value. Also, market value could be increased if internal routines could accommodate better the emulation in the TMS of inherited systems, thus reaching superior efficiency and competitiveness.

This experience helped OT understand the value and the needed discipline of standard processes to put out a system applicable to textile industry of any size. Learning from technical needs, OT redesigned its organizational structure to be more efficient and quick answerer. Then gradually procedures and standards were established to collimate efforts and decrease conflicts among system experts. As standardization of internal processes was consolidating, OT was able to better penetrate its market and expand shares, first in Brazil and then in South America.

4.2.1 Normative Stage Analysis

The normative is by definition, a transitional stage. It begins when market standards of acceptance indicate the minimum requirements for the product to succeed. These standards then, limit the features of the product, indispensable for market massive acceptance. On the other hand, as the product becomes known and market accepted, similar products and surrogates are progressively mimicked in the market. Product novelty loses the initial impact and enterprises focus on to increasing availability and to expand market share. Focusing on production, however, means to reorient efforts to establish production standards to guarantee quality and productivity, that is, to guarantee organizational effectiveness. The economy of the competition changes to a different rationale, from premium (novelty) to a low price. Narayan (2000) identified the basic characteristics of the normative stage pointing that organizational maturity progresses as production structures and activities are normalized to determine the best logistics of the workplace towards decreasing costs. Narayan (2000) also notices that while product technology is incorporated, that is, a dominant design and set of processes are adopted, the predominant model defines the production profile. In the market interface, efforts increase from awareness of the product, to preference and then to purchasing decision.

At OT, market acceptance of TMS consolidates after OT decided to cut external alliances for product development and lead internal efforts to adjust TMS to market claims. Investments for system development internally required a natural expansion of human resources and an organizational redesign to accommodate growth. Administratively, a new structure was designed and implemented. The original organic structure of OT was kept, however, responsibilities and managerial limits of power were better defined. At the production, that is, at the software development level, new standard procedures and formal flow of communication were applied attempting to standardize workplace processes. Flexibility in the decision making process was restricted, allowing for rules to play a bigger and increasing role in the dynamics of OT.

4.2.2 Traps of the Normative Stage

What traps could be hidden in the normative stage? Many traps could be hidden, from rigidity due to norms restrictions, to paralysis of entrepreneurial spirit. One important trap is the new role that the organization gives to control (to measure performance). Control, and its process, is a major change in the organization, in and tend to acquire a bigger and bolder status in the organization than it should. It becomes so important that it ends up self-contained and more important than other preceding administrative functions, such as planning. As a result, the augment and rigidity of control and the filtering of dissonant information creates a paralysis of the original paradigms unloading the existing entrepreneurial spirit and limiting the innovation ability of the people in the organization. The most important trap, nevertheless, seems to be the rigidity over organizational dynamics, originated in the emphasis on norms and regulations. Efforts to conform market standards of acceptance and to control performance increase the power of internal rules (bureaucratization) toward the conformity, pacifying the original dynamics. The enterprise bureaucratization plays against the nature of a technology-driven business, creating an imbalance between the needed flexibility and the required internal ruling to discipline productivity. The imbalance also surrogates the creative characteristics of the first stage (beginning), with the parsimony of this stage, pushing operating effectiveness to standardization of processes.

4.2.3 Interpreting Traps of Normative Stage at OT

Growing to be a market standard is crucial to a technology if it is to become market successful. Market acceptance of a product may determine a trend in the competitive strategy of the enterprise towards mass production. Mass production, however, requires standardization of processes and products. It makes formal rules and procedures the foundation of the organizational performance. The order and rhythm of internal dynamics are established by rules that curb people's behavior and curb also the expected level of productivity (Utterback,1994). The flexibility of the first stage is gradually replaced by a system of rules, determining functions, decision making processes and production flows. The organization now needs to concentrate on conformity, rather than creativity, to gain market presence (Hill, 2002). At OT, the competitive strategy changed, deemphasizing values related to product novelty and highlighting values supporting standard procedures, hierarchy and compliance. The enterprise stressed organizational value attributes that help it compete, since scaling up means narrowing profit margins from individual product. In other words, OT concentrated on acquiring advantages from scaling up production by expanding client's portfolio, instead of advantages from product novelty.

4.3 Mass Production Stage

Mass production stage is characterized by organizational stability, where the enterprise acquires a dynamic equilibrium between rules and flexibility (Adizes, 1999), reaches maturity (Bernhoeft, 1997), and initiates a cycle of growth by collaboration (Greiner, 1986). Externally, as market standards of acceptance are established, the focus of the competences changes to increasing marketing management. Access value attributes, such as accessibility, availability and pricing are the essentials. Enterprise then competes based on cost leadership either on large or narrow scope markets. In this stage, the product becomes a commodity and must be produced and sold as such.

What happened at OT? After integrating all basic function required by the industrial textile market, OT ended up with a TMS with over ninety functions and respective modules, involving all administrative, infra-structure, commercialization (marketing/sales) and production features. An acceptable TMS could then be sold in the market, driving OT's attention specifically to market expansion. The focus of the business changed from internal adjustment to external marketing problems. Additionally, OT needed to modify perception of their clients in the textile industry, as expressed by the marketing manager:

We had a major problem trying to convince them on the value of our system (TMS) over their information technology already in place. Words, spoken and written, were not strong enough. We needed something else…

The strategy for OT's market penetration was to sell TMS on the basis of warranties of return. OT first evaluated the level of productivity and profitability of each client. Then, OT established the price of TMS based on the warranty that TMS would give a certain return (a percentage) after a specific period of the system implementation.

The process was quite simple. In despite being risky, the process was effective for OT in terms of closing sales. To do this, OT sends his expert to study the client processes and take a close view of costs and profitability rates. Then, studying the client's registers and the day-to-day operations, OT can evaluate its profitability. A report of current profitability would be produced and discussed with client to agree upon parameters, metrics and current values. Performance report considers, among other, macro factors, such as the business liquidity; the current costs (overall and by area); the volume of sales; and the products marginal contribution. Based on these data, OT determines an overall performance index of the company's business performance. A methodical analysis follows, to evaluate possibilities, constrains and facilitators considering a probable performance of the company if TMS would be in place. Then, a proposal is developed and proposed the adoption of TMS, for a trial period, indicating the expected decrease in operating costs by the end of that trial period.

The challenge, incorporated in the proposal, is that, if OT's system (TMS) would not reach the goals by the end of the trial period, then the client would not have to buy it or even pay for the trial expenses. The goals of the proposal involve mainly the measure of the increase in productivity, the decrease in costs and the overall quality, ensure by TMS. Each company has to previously agree upon the rates and the evaluating parameters given previously, as a condition for OT to determine the goals, in terms of quality assurance, costs and overall productivity of the company.

Pricing TMS on the basis of a return index and running the risk of going back home with no deal was a significant innovation in OT's business technology, specifically regarding marketing management. The confidence on the efficiency of TMS, that is, the proven superior performance of the software and specially, the success of each sale using this strategy, leveraged TMS sales and OT's market share in the textile sector. TMS has been quickly established itself as a standard production and administrative automation system in textile companies in South America.

OT also perceived that for market penetration on a mass production stage it needed a trustful trade mark to consolidate organizational image. OT also needed to shorten the image consolidating time to build name branding in the market. There was a clear need to quickly build the intangible attributes (system's trade mark and OT's image), and maintain, but not lessen, attention to fundament attributes (product technology, design, quality and similars). OT then went back to strategic alliances with national and international companies. The alliance with J.D. Edwards, for instance, gave the opportunity to stand before international clients (textile clients) and more aggressive competitors, helping consolidate TMS trade mark and increase its market share.

4.3.1 Mass Production Stage Analysis

Mass production stage involves characteristics in the opposite end of a new product launching spectrum. At this point all market acceptance standards, regarding quality, price, functionality and usability, are in place. To mass product, processes must be standardized and product is marketed mainly through a mass market strategy. Contribution margins by piece are small, but market size can be enlarged. As the product becomes known and accepted, fierce competition fires up in the market context. Internally, besides process standardization, structures and functions are clearly defined and aligned, leading to a better organizational effectiveness. Emphasis is set on developing business process competences and on building balance between norm and flexibility, especially in market interface. The attention to

innovation changes focus from product technology to business technology. Access value attributes, such as, price, financing, accessibility, availability and impulse, are pursued as the fundament for business innovation. Besides pricing, branding becomes the preferred strategy for market penetration. If the first two stages concentrated in the business structure, this stage focuses mainly on market interface.

4.3.2 Traps of Mass Production Stage

The basic trap of the mass production stage is the business systematization itself. Business systematization involves process standardization through well defined lines of hierarchy, division of work and productivity standards. Norms curb the decision making process. But, if for one, business systematization increases the organization capacity to compete in a mass production context, for the other, it could make business to become obsolescent. As pointed, the adoption of the norm as the pattern for decision making, the enterprise tends to decrease creativity, either to create new products (applications in the case in discussion), or to find new ways (processes) to manage, to model and to produce. It is easy to see that the effectiveness of a mass production strategy depends on a higher level of internal standardization. However, the enterprise can only concentrate on profit maximization through market expansion, if it does thoroughly the business systematization. And that is the remarkable trap. Revenue increase, other than through its own line of products, for example, are set aside or not pursued (at least, not vigorously) by the organization, because of a lessening endeavor to explore different format of innovation, such as the open innovation (CHESBROUGH, 2003). In the end, rules, norms and productivity standards turn out to be so important that a resulting normative aristocratic culture tends to restrict the capacity to create and innovate along the entire enterprise.

4.3.3 Interpreting Traps of the Mass Production Stage

Business systematization through norms and regulations ends up to be the main responsible factor for decreasing creativity in the organization. It begins by slowing down product development and finishes by limiting business innovation. In the mass production stage, the challenges to be dealt with are not only the scale up production, the cutting costs or the market leadership. Technology-driven enterprises need to face a paradoxical issue, embedded in the process of norms and rules systematization. Once competitors jump in the same arena, competitive advantages for the leaders become difficult to be kept. What may hold leaders back is an easy and natural accommodation induced by the use of norms in the decision making process, administrative and production processes that states the internal dynamics by curbing people's behavior. In general, if the enterprise maintains course, competitive advantages will come only through innovation in business technology.

In the OT case, once market accepted the basic set of TMS functional features, indispensable to increase productivity at textile companies, the major effort at OT would be to expand client's portfolio. OT then, decided to commoditize TMS. The structure or internal division of work was formalized by grouping similar features under a specific division. Internal focus of efforts detoured from designing and programming new applications to maintaining and producing (that is, emulating applications in the established ones). TMS went from a vertical and customized type of product at its launching, to a horizontal or shelf product one (generic type) changing a potentially innovative context. Now a customized ERP could pose a threat to TMS, unless OT anchored in a strategic control area, for instance, innovation in applications emulated in the established ones.

5. Lessons - Developing Competences

Since its inception OT evolved based on distinct roles of innovation in its business model. During the first stage (beginning), OT focused innovation on developing the TMS to launching a winner product (Figure 1). The major challenge was to build features useful to the specific nuances of the textile industry. The first version of the software went out to the market name-branded as Textile Manager (TM). Few corporations were willing to pay the price for the novelty. Feedback from first users allowed OT to redesign the software, increase integration and expand functions. The software was then re-launched as the Textile Manager System (TMS). The focus of the innovation was tangible and fundament value attributes related to functioning, designing, technology and quality. These attributes are linked to the first three stages of IT systems development (systems analysis, design and programming), a clear focus on product technology innovation.

In the second stage (normative), beginning after market reaction to TMS re-launching, OT's innovation focus diverted to conformant value attributes, such as, compatibility and performance. The gradual market acceptance of this version induced OT to initiate the internal adoption of norms and standards, mainly to speed up emulations and customizations required by clients. Standardizing norms, processes and structures was a must (Figure 1). At the same time, a noticeable diversion in IT systems building phases, meaning from product designing and programming to maintaining and producing phase, was slowly profiling the OT's business model.

Insert Figure 1 Here

At the third stage (mass production), TMS was market accepted. OT needed then to reshape its market interface, since mass production stage requires efficient marketing strategies (Figure 1). New competitors, such as Magnus, a system from Datasul Ltda. were launched at the time OT was in the middle of the standardization process. OT refocused its market position, by accelerating clients' applications in TMS, by increasing system's compatibility and by increasing customization, flexibility and processes. Internally, OT maintains emphasis on normalization to decrease TMS time to market as well as, to control cost production. Innovation changes from product technology to business technology (that is, to business model and attributes).

Innovation in TMS applications and quality characteristics kept OT from losing market leadership. Production, integration functions and flexibility in customization of TMS as well, quickly turned it the preferred system among the bigger textile companies in Brazil. Winning this market became then the passport to make TMS acceptable by medium and small textile companies, in the Brazilian and in the Latin-American markets.

5.1 Implication for the Business and the B2B Marketing

Evolving from one stage to another implies managing changes in different ways. Contextual characteristics of the beginning stage are clearly different from the normative or the mass production stages. Analyzing what happened at OT, we found what is described in the Figure 2, pointed under different circumstances to specific events by many authors, such as Hruby (1999), Adizes (1999), Kampas (2003), Hagel III (2002), and Jonash; Sommerlatte (1999).

In the beginning stage, developers center attention on creating market most valuable features into the product: novelty and value attributes. The novelty speaks for itself, but value attributes must support the novelty to expand the perceived competitive advantages. For instance, tangible product value attributes such as functioning and performance, and fundament value attributes, such as, design, innovation and technology, are more supportive of advantages and should convince easily companies in needs of advantages in the B2B market. In this stage, the enterprise is more pro-active, as notes Kampas (2003), and product novelty and the weight of value attributes give to the developer most of the bargaining power, allowing for introductory prices with a higher profit margin (Figure 2). Novelty is more important in the product *launching*, where it comes out as an exotic peace. As the product reaches more enterprises, novelty decreases in importance and value attributes begin to count. Margins decrease while the product slips to a specialty and then differentiated categories.

Insert Figure 2 Here

In the normative stage, the required internal competences change in order to increase the ability to bolster and tight the industrial market relationships. Most product attributes of fundament, such as design, technology, quality, security, and some tangible attributes, such as, performance, technical support and compatibility, are critical for a superior marketing performance. B2B market, in general, accepts product novelty as a much bigger value as compared with product cost, because of the potential competitive advantage of the novelty. The extension of the bargaining power of the developer, however, is contingent to the perceived product value attributes to users, regarding the additional competitive advantages. Here, however, a much bigger attention must be given to the market accepted standards (Figure 2) by the developer, or the product will be accepted. At OT, the normative stage began at the time of the re-launching of TMS. OT incorporated to the first version of TMS, all suggested modification by the early clients and added some basic new application (mainly for administrative purposes), as the intuited market standards of acceptance. TMS became known for most of the textile industrial market in Brazil and some countries in Latin America. But as a textile genuinely oriented system, it was well differentiated from other rival industrial ERPs.

In the mass production stage, the product becomes a commodity and corporate competences turn to the administrative and production management standards (Figure 2). Production standards should guarantee the highest levels of operating effectiveness and productivity (PORTER, 1996). Administrative standards should determine the right competitive strategy, focusing mainly in the marketing strategy. Competitive strategy, generally, depends on top management vision, but the organization needs to develop a strategic thinking to collimate and impel efforts in the direction of the needed environmental adaptability. In this stage, corporate capacities relate to the access value attributes, such as price, financing, accessibility, availability and the like. They are the most important elements to be work out, because they define the profile of the business model for this stage. However, access value attributes are market oriented and also shape the marketing strategy for the industrial market to be served.

At OT, marketing strategy relies on accessibility value, configuring an innovation in the business process. Instead of selling a product, OT sells results, a language that any industrial client would understand. To do so, OT negotiates with each potential buyer, why and how the deal (purchase of TMS) will be carried out. OT's strategy is to do a preliminary evaluation the current productivity and profitability of the client's business. The cost of each set of production process is determined and evaluated according to the ABC's cost accounting rules. Then, on the basis of the data evaluated, a

client's business performance index is set by OT for a pre-defined period. This period is long enough to If results were reached, the client would pay for TMS, if not, the deal would be canceled.

Clearly, in this stage, the rationale for doing business was far distinct from the rationale used in the beginning and/or in the normative stages. Since the bargaining power of the business switched from the developer (or offer) to the clients, the competition advantages became the benefits embedded in the business format. So value attributes, such as, accessibility should be supported be the right pricing and financing strategies, two critical value attributes to make the marketing B2B strategy work.

The evolution of the business model for technology-driven enterprises highlighted two distinct areas of innovation, the product and the business innovation strategy. The Figure 2 shows that, from the introduction up to the market acceptance standards, the enterprise corporate strategy should focus on developing technical capabilities, to better handle product value attributes, such as, functioning and/or compatibility features. Emphasis on corporate capacities (technical capabilities, corporate competences, technology domain, and the like) will reshape the business model and the market interface approach of the enterprise. In the Figure 3, we depict, in large traces, the implications of the effort on product technology innovation. During this phase, organizational and competitive strategies are basically neglected, because product features and novelty should win out the market. The business conforms to the needs (capacities) within the enterprise to provide the attributes considered essential to market acceptance. The main area for product technology innovation is the interface between corporate and competitive strategies (Figure 3).

Insert Figure 3 Here

After market acceptance has been consolidated, the enterprise needs business capabilities and flexibility to expand product shares in the market. This phase we call it business technology innovation phase (Figure 2). In this phase, technology-driven enterprises must control the fundamental ability to add value to the transaction process, through a reshaped business. Now market relationships get the most attention. Branding, market positioning and strategic alliances to assure control to and of desired market segments orient priorities, resources and investments. At first, the value of the innovation is learned from the competitive environment, through co-creative experiences (Prahalad; Ramaswamy, 2003) as the origin for value generation. So, organizational flexibility and business processes are critical for the enterprise to succeed. Therefore, innovation in business is concentrated in the interface between competitive and organizational strategies, as well as between organizational and corporate strategies, as shown in Figure 3.

The idea of co-creative experience pointed above, follows a similar concept to the open model of innovation (Chesbrough, 2007), using ideas available in the many sources of knowledge, mainly coming from buying experiences of costumers. The main issue here is to find ideas and key business processes to guarantee added value to the product. The value at this point is not product novelty, but a disciplined set of business and production processes and an optimized infra-structure now to curb market efforts.

At OT, the most recent application of TMS, such as, distance client training services and business process to sell TMS (purchase defined by the TMS index of returns), indicate an important innovation in business technology acquired by OT, both originated in co-creative experiences. Client distance training, for instance, became an excellent tool to identify weaknesses derived from the system complexity to easy the implementation of the system (ease of use value attribute was detected as one of the most important features of new products leading to market acceptance).

Lastly, to control the fundaments of business technology innovation, technology-driven enterprises must evolve two administrative tools. One is the technical and the other is the competitive intelligence (Rodrigues; Riccardi, 2007). The technical Competitive Intelligence should boost the product technology innovation abilities of the enterprise. The competitive or business intelligence should boost the business technology innovation abilities. Both intelligence systems will provide consistent information for the decision making process about corporate capabilities and about the competitive environment, technological trends, chunks of knowledge and innovation locatios in the world, client preferences, competitors strategies and trends of market segment preferences. The systems will help enterprises establish an efficient innovation and business strategy conducive to better marketing activities for continuous growth.

6. Conclusions

The analysis of a business to business technology-driven enterprise combined with organizational life cycle and technological maturity allows us to propose a Technological Maturity Model (Figure 2) supporting corporate, competitive and organizational strategies (Figure 3) that will assure superior marketing performance. A contextual analysis of this model induces to some important conclusions, configured at least to the studied context. First, we can state that the technology-driven enterprise studied does hold a well defined technology maturity cycle, determined by the relationship between rules and flexibility. As product is scaled up, rules and standardization of processes become consolidated. The dynamics of the organization loses flexibility, but it gains in productivity.

Second, the innovation focus changes according to the market standard of acceptance as a corner stone. For the analyzed organization, before that mark, innovation strategy focuses on product technology innovation. Internal competences stimulate innovation on value attributes related to the product only. After the market standard of acceptance, innovation strategy focuses on business technology innovation. Market feedback consolidates corporate competences, as well as organizational adaptation, to increase competitive effectiveness.

Third, in the analysis context, a technology-driven enterprise may opt for one of three strategies: (a) adopt product innovation strategy, making this strategy the basis to build continuity to its business (marketing through product novelty/innovation); (b) adopt business innovation strategy and to compete through it (marketing through business innovation); and (c) adopt a product innovation strategy, based on a product value attribute, but remain in the business technology innovation phase (scale up production) and make this the strategy to compete (marketing expansion through product innovation).

Fourth, lessons taken from OT strategic trajectory allow us to deduct that the comprehension of structural factors, either related to product technology maturation, or related to the organizational life cycle of a technology-driven enterprise would boost to establish a consolidated corporate strategy (Figure 3). The adoption of any strategy commeted above should consider the organizational maturity stage. To be effective the innovation strategy must use internal competences accordingly. Internal competences, on the other side, reach a peak of effectiveness as the organization transits completely in one stage of maturity.

Finally, the effectiveness of the innovation strategy, as consequence of the integration of corporate, organizational and competitive strategies, is dependent on the synchronism with the organization life cycle (beginning, normative, mass production). It also depends on the exploration of corporate competences related to each product life cycle (exotic, specialty, differentiated, commodity). For instance, the adoption of product innovation strategy to reach the market and subsidize marketing strategies, must promote structural flexibility. The related organizational competences to be stimulated involve an entrepreneurial, divergent, exploratory and creative climate. Conversely, if the option is for a business innovation strategy, then attention should be given to standardization of administrative, business and production processes, that is a decrease in structural flexibility. In any case, the stages of structural maturity, the product life cycles and the technology innovation phases should be synchronized to increase business performance.

References

Adizes, I. (1999). *Managing Corporate Lifecycles.* Englewood Cliffs (NJ): Prentice Hall.

Baardwijk, N. V., & Reinmoeller, P. (2005). The Link Between Diversity and Resilience. *MIT Sloan Management Review*, 46(4), 61-66.

Bernhoeft, R. (1997). *Como tornar-se Empreendedor em qualquer idade* [How to becoming entrepreneur at any time]. São Paulo: Nobel.

Chesbrough, H. W. (2003). *Open Innovation: The New Imperative for Creating and Profiting from Technology*. Cambridge, MA: Harvard Business S. Press.

Chesbrough, H. W. (2007). Why Companies Should Have Open Business Models. *MIT Sloan Management Review*, 48(2), 22-28.

Christensen, C. M., Johnson, M. W., & Rigby, D. K. (2002). Foundations or Growth: How to Identify and Build Disruptive New Businesses. *MIT Sloan Management Review*, 43(3), 22-32.

Evans, N. D. (2002). *Business Innovation and Disruptive Technology: Harnessing the Power of Breakthrough Technology*. Englewood Cliffs, NJ: Prentice Hall.

Farrel, L. C. (1993). *Entrepreneurship*. São Paulo: Atlas.

Fleming, L., & Sorenson, O. (2003). Navigating the Technology Landscape of Innovation. *MIT Sloan Management Review***,** 44(2), 15-24.

Greiner, L. E. (1986). *Evolução e Revolução no Desenvolvimento das Organizações* [Evolution and Revolution in Organizational Development]. São Paulo: Nova Cultural.

Hill, C. W. L. (2002). *International Business with Global Resource CD, PowerWeb and World Map*. Boston: McGraw-Hill (Irwin).

Hruby, F. M. (1999). *Technoleverage.* New York: AMACOM.

Jonash, R. S., SOMMERLATTE, T. (1999). *The Innovation Premium*. Reading, MA: Perseus Book.

Kampas, P. (2003). Shifting Cultural Gears. *MIT Sloan Managemen Review*. 44(2), 41-48.

Mohr, J. (2001). *Marketing of High-Technology Products and Innovations*. Englewood Cliffs, NJ: Prentice Hall.

Narayan, V. K. (2000). *Managing Technology and Innovation for Competitive Advantage*. Englewood Cliffs, NJ: Prentice Hall.

Porter, M. (1996). What is strategy? *Harvard Business Review***.** November-december, p.59-78.

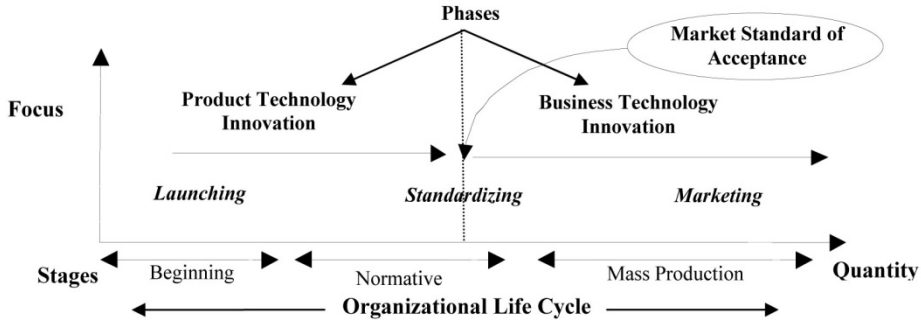
_____. (2008). *On Competition*. Boston (MA): Harvard Business School Press.

Prahalad, C. K., & Ramaswamy, V. (2003). The New Frontier of Experience Innovation. *MIT Sloan Management Review*. 44(4), 12-18.

Rodrigues, L. C., & Riccardi, R. (2007). *Inteligência Competitiva – nos negócios e organizações*, [Competitive Intelligence – in business and organizations. Maringá (PR): Unicorpore.

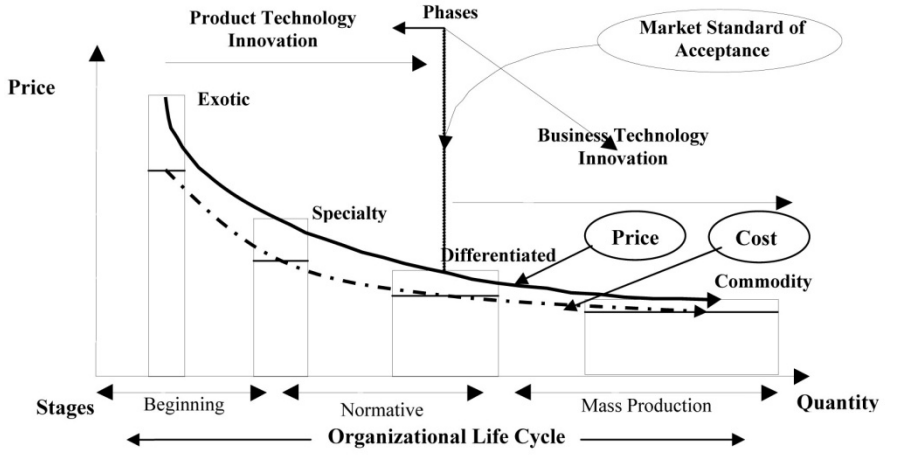
Schein, E. H. (2004). *Organizational Culture and Leadership*. San Francisco: Jossey-Bass.

Utterback, J. M. (1994). *Mastering the Dynamics of Innovation.* Boston (MA): HBS Press.



Source: Based on Hruby, F.M. **Technoleverage.** New York: AMACOM, 1999; Adizes, I. **Managing Corporate Life Cycles.** Engelwood Cliffs: Prentice, 1999.

Figure 1. Innovation Focus in Organizational Life Cycle



Source: Based on Hruby, F.M. **Technoleverage.** New York: AMACOM, 1999; Kampas, P. Shifting Cultural Gears in Technology-Driven Companies. **MIT Sloan Management Review**, v.44, n.2, 2003; Hagel III,J. **Out of the Box**. Harvard Business School Publishing, Cambridge, 2002.

Figure 2. Innovation Process in a Technology-Driven Enterprise

Figure 3. Innovation, Strategy Integration and Business Configuration

Advances and Challenges for Adoption of Activity Based Costing (ABC) by Public Sector: A Comparative Study of Brazil, Colombia, Uruguay and United States

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Abstract

This article aims to evaluate the advances and challenges to the adoption of the activity based costing system (ABC) by the public sector of countries like Colombia, Uruguay and Brazil, always keeping a comparative perspective with the historical experience of the United States. Considering the growing demand of citizens-users of public services in terms of quality, accountability and transparency, and also the convergence of international accounting and management practices, such as convergence on IPSAS by the public sector and the adoption of IFRS in the private sector, encouraged by economic globalization, the study in comparative perspective between different experiences become relevant to public sector organizations, in order to inspire public policies in that direction. The results found by the present research reinforces the conclusions of previous papers (Nunes 1995, IFAC 2000, 2002, 2003, Duarte Martins Mauss and Souza 2008), reaffirming the relevance of the ABC system information for the decision-making process also in the public sector.

Keywords: Activity based cost, Public Administration, Public sector, New public management, Accountability, Convergence, Brazil, Colombia, Uruguay, United States

1. Introduction

The so called national economies are under a transformation process during the last two decades, in the sense of a stronger productive interdependence among then. Besides the traditional interdependence verified after several decades in the financial markets and also in trade, the high degree of economic interdependence can be noticed now also in the institutional level as well in the productive sphere.

The most visible signs of this trend are the development of regional trade agreements, the growth of the intra-firm trade, the growth and the dispersion of foreign direct investment, the convergence of economic market factors and technologies, as result of the growing importance of global productive networks and supply chains to the local economies. At the institutional level, the spread of regional integration and trade blocs and multilateral regimes all over the World seems to follow the global network economy *modus operandi* and provide new and effective forms of governance.

All these trends related to a stronger economic productive interdependence point not exactly to the fall of borders but to a lower level of the capacity of control of the territorial national State over the growing number of multiples channels of integration between the different economic regions, in the commercial, financial, productive and corporate level. In this context, not only the governance effectiveness through the traditional public policy is affected, but also the corporate management practices are affected.

All these transformations can be considered as result and cause of the prevailing dynamics of convergence in the global economy. According to the convergence hypothesis, the greater is the openness and greater is the economic integration to the global economy, stronger is supposed to be the dynamic of convergence, which may drive different aspects such as price levels, market practices, consumption patterns, technological solutions, communication gaps, institutional behavior but also management practices. The logic of the transfer of technologies and techniques follows the investment as well the practices follow the information. The logic of "benchmarking" seems to be present and comprehensive. In this context, also the corporate governance technique follows the spread of the information technologies.

For several decades, according to Hansen and Mowen (2001), companies didn't use to care very seriously about the presence of similar products in oversee markets and much less about questions related to the nature and origin of management control practices in use, because they were separated by geographic distance and protected by market niches. But is was due to some key factors, such as opening markets and international competition, as Wernke (2004, p. 75) reminds us, that organizations are compelled to seek methods to assist in the decision making process, including now an enhanced global rationality, optimal solutions discussed and nurtured in competitive markets, and other essential strategic elements to its permanence in the market segment.

Is this context made of weaker public governance over markets and stronger linkages among economic networks of global range, the market actors decision making process would be affected by a considerable higher degree of incertitude, since, in an interdependent global economy, the new linkages become so complex, even when considering only local markets, always determined by variables from the international business environment.

This is precisely the environment where institutions are valuable and socially demanded, since institutions can provide effective support to bridge the "market failures", understood as rationality failures, in terms of access to information and reduction of transaction costs. And, in a context of retreat of the bureaucratic State institutions, this demand for bridging rational gaps institutions is, each time more in post-modernity, supplied by institutional regimes, public but non-State institutions, market institutions or even by international regimes.

In this context, the economic interdependence in global regional or scale, which enhance and accelerate the movement of economic flows over and under the traditional national and territorial governance boundaries, can be understood also as an inductor factor for reducing costs of organizational activities and processes, due to the increased competition, now on a global scale, updating in global terms the permanent pressure for reducing inefficiencies and waste, but also reducing the transaction costs in market structures itself.

One of the most interesting aspects of this process is that some of the transformations in terms of interdependence and convergence observed in the international economy can also be observed in the public sector management. Since the 1980s, we have been witnessing the emergence of the New Public Management, as a result of the crisis of the traditional "bureaucratic State" and the emergence of the social demands for improvement of the public services supplied, as shown by Lozano and Valencia (2008, p. 85) in the article "Presupuesto y public spending: Secretaría General de Presupuestos y Gastos".

In this sense, this present study aims to access how the economic actors but also the market structures can benefit from adopting management regimes and standards practices, upgrading individual corporate performances and also reducing the transactions costs existing in market structures. The case to be analyzed as a trend of convergence of management techniques will be the adoption and diffusion of the ABC system, the Activity-Based Costing system in the public sector of emerging economies of Latin America, with special attention to the developments in Brazil, Colombia and Uruguay, always in a comparative perspective with the historical developments observed in the United States.

The quest for higher transparency of public sector spending and better quality of services supplied have widespread over the public sector in all Latin America since the reforms of the 1990s, and several managerial procedures have been gradually incorporated to the State institutions. In this context, the problem of cost determination is commonly central but always elusive to the management of supplied public goods and services, as seems to indicate the several studies, such as Duarte (2002), Cruz (1997), Slomski (2003), Ribeiro Filho (1997), Nunes (1995), BNDES (2000), Félix and Gomes (2008) and Mauss e Souza (2008).

This paper, initially, describes the problem of search to then make the literature review. In the sequence, was dealt with the methodology and the comparative study focusing the challenges of adoption of the ABC system in the public sector in Latin America, in countries like Brazil, Uruguay and Colombia, always in a comparative perspective with the case of United States. The review of literature will try to highlight the most important and pioneer initiatives, common developments and problems reported.

1.1 Research Problem

This paper aims to discuss one specific aspect of the general dynamic of convergence, also related to the building international patterns and regimes. These trends are assumed as important characteristics of the contemporary economic globalization.

The focus of this work will be set on the convergence of management and corporate governance techniques, a process that is motivated by the expanding global networks of investment and information. These productive global networks seem to be determining the trade patterns, the foreign investment pattern, the technological convergence pattern and also the management techniques patterns.

The present paper wants to contribute to the understanding this process through the analysis of the dissemination of the ABC system among the public sector management of some Latin American countries (Brazil, Colombia and Uruguay), in comparative perspective with the United States experience, seeking patterns of common challenges for the adoption of this management standard, specially in the public sector management.

The research aims to answer the following question: what are the advances and challenges for adoption of the ABC system by the public sector of countries like Brazil, Colombia and Uruguay ? Which patterns and determinants is its development responding to ?

The answer to this question will indicate in what extent the public sectors of the studied countries have been stimulated by own experiences and positive results or have integrated ready-made management models and techniques.

1.2 Research Objectives

The objective of this research paper is to produce insights to those public policies initiatives aiming the reform of public sector management in the sense of enhance the rational performance in the public sector and better cost reducing results. The study will be carried out through the comparative analysis of the implementation and diffusion processes in specific Latin American countries, namely Brazil, Colombia and Uruguay, always considering as reference the historical experience in the United States, considering the convergent and divergent aspects and exploring the possible determinants for its advance of the adoption of ABC costing system in the public sector, according to the available literature.

1.3 Methodology

The methodology used in this research is based on an exploratory comparative study, reviewing the literature about the ABC system in the public sector of some Latin American countries, order to identify trends and hypothesis.

The research design and the choice of the studied countries are based on the intention to offer economic and economic representativeness and also some degree of geographical and economic variety. Thus, following these criteria, two countries are members of “Mercosur” (Brazil and Uruguay), another country is member of the Andean Pact (Colombia), one is a large and (relatively) closed economy (Brazil), one is a middle size economy (Colombia) and the third is an example of small and open economy (Uruguay).

In this sense, the countries were chosen also in function of the availability of information concerning the adoption of the ABC system in the public sector. The special case, working as reference to all others, is the United States, where the ABC system was initially developed and is increasingly being adopted by the public sector.

2. Theoretical References

2.1 Globalization and Convergence

One of the basic assumptions of the present study is based on the hypothesis that openness and interdependence of local, regional or national economies with the global financial, productive and technological networks produce convergence. Convergence can be noticed in different areas and levels of the economy, such as market factors, prices, practices, technologies and techniques, rules and norms, and even language.

Convergence could be understood, in this sense, as a major dynamic operating in the international economy, in its global networking era, a dynamic resulting, basically, from the contact. Economic contact, recently stimulated by the greater importance of global networks (financial, productive, informational), can redefine aspects such as connectivity, continuity and proximity, which, by their turn, can redefine the own shape of the economic space.

Since “contact” is sharing and also learning, even the cultural perception of distance and the cultural perception of similarities can be transformed by the growing interdependence. Geographical proximity sometimes doesn't mean necessarily to be a determinant to the perception of what is “different”, as indicate the researches of Leite (1981) in “cultural affinities of the Executive and the selection of eternal markets in Brazilian companies producing

manufactured goods" and Freire and Rocha (2003) in the article "The new frontiers: the multinacionalização of Brazilian companies".

Distance is an economic concept and not a "Euclidean" concept, based on the straight line, according to the expression adopted by the World Bank report (2009). The economic distance is related to the access and the connectivity, following an economic space shaped in form of networks, more and more a space of flows and less a space of places (Castells 1999), or a space of circularities.

In this sense, the economic linkages with the Brazilian economy, or the absence of them, make in many cases the neighboring Colombia farther than United States (Freire and Rocha, 2003). It is also what detect Stöttinger and Schlegelmilch (1998) in the article "Explaining export development though psychic distance: enlightening or elusive?" quoted by Freire and Rocha (2003, p. 107), suggesting that "the concept of cultural distance had become less important due to the globalization of markets".

This idea of convergence as a byproduct of interdependence and openness to the global economy is based on the works of neoclassical economic theory of trade. According to this model, the market economy would be based upon the rational logic of specialization as the way to achieve efficiency and productivity. Once fulfilled the requirements of free movement of factors through the economic space, occurring between the different sectors of the same economy or occurring between the different national economies, the rational seek for efficiency through specialization should provoke an equalization of opportunities, a better distribution of factors, an improvement in the optimal allocation and, hence, a general dynamic of convergence.

In this context, the higher is the level of connectivity and unification existing in some given economic space, higher tend to be the degree of specialization, optimal allocation and convergence in that space. Thus, it would be the existence of fragmented and segmented economic spaces, due to institutional, political or infrastructural reasons, that would stimulate the development of local autarkies and economic divergences and imbalances.

In this sense, the contemporary economic global networks seem to be capable of accelerate the economic flows, transporting goods, services, capital, technology and information, enhancing contact, opening space for innovation but also for increased competitiveness, now on a global scale. Both trends seems capable to ultimately represent a factor of pressure and then inductor of changes, pushing organizations is the search for alternatives for reducing costs or improve performance.

The contemporary transformations could be understood as a qualitative new trend, touching the productive base of the economy, where the productive process is each time more organized as productive corporate networks of global reach, and, according to Castells (1999), can be considered as the "basic organizational form" of the global economy. Important indicator of this new basic organizational form is the growing importance of the intra-firm trade.

Its importance in the international trade relations grew from 30% in 1970 to 55% in 2000, according to the World Bank (2009). The sharp resumption of the foreign direct investment in the world economy during the 1990s, especially in the emerging economies, could be understood as another sign of the consolidation of global productive networks, passing from the traditional level of 6% previous to the 1990s to 11% of the capital formation in 2005, in the World economy. (RICUPERO 2007)

In the managerial environment, this trend can generate a new demand from the citizens-users pressuring the public managers to a better performance and efficiency in the supply of public goods and in the management of public institutions, which may rely on the principle of the lowest cost in conjunction with the highest quality.

Of course, broader forms of contact also generate uncertainty and fear, especially in periods of "great transformations", inspiring, not infrequently, the adoption of protective policies, as a form of reaction against the loose of references and the uncontrolled side effects. During those times is common to arise different forms of localism and autarky, such as the search for local solutions, the protectionism in its several forms and levels, and reliance upon domestic resources, as well the arising of new diffuse demands for "control" in the cultural background.

In the case of the economies focused in the present study, is possible to see some indicators of integration to the global economy. The degree of openness existing in each economy tells us a little about the trade connections with the rest of the World and much more about the degree of importance of the domestic market to each economy. The Table 1 shows the degree of openness of the studied economies.

But when we compare the degree of participation of the foreign transnational corporations in the industry sector, we can have a closer idea about the productive integration to the international productive networks, as can be observed in the Table 2.

2.2 The Problem of Efficiency in the Public Sector

Studies conducted by the Secretary to the Federal Budget, of the Brazilian Government (SOF, 2008: p. 9), pointed out the "need" of a control system based on a detailed cost information structure, as the best support for the management of the public sector. This system could guide the decisions of agencies running public policies but also for the central State bodies of the public administration. This cost-based information system would consist of a "circular flow" focused on the cost information.

This perception expressed in recent policies of some sectors of Brazilian administration seems to extend and deepen the two decades old debate of reform of public administration in the sense of a more rationally managed public sector, in the sense of higher accountability and efficiency of public resource management, as remind us Beckett (2002).

In the same direction, Alonso (1999, p. 45) in the article "Cost in public service**"** reminds that "the correct calculation of the costs of public services and its publicity are powerful instruments of social control, allowing [...] the evaluation of efficiency of services provided ".

All this effort of reform of the public administration, broadly called as "new public administration", consolidated new priorities and methodologies, all inspired in the almost consensual liberal visions in the 1980s aiming to reduce the size of the State, and, at the same time, to foster a managerial and rational approach to the remaining State institutions.

Other premises were also stimulated the autonomy and the decentralization, as well the greater involvement and participation of the civil society. Beyond the direct privatization, the new policies also seek to promote the indirect administration, based in regulatory agencies and concessions to private suppliers.

All these trends have inaugurated a more diffuse boundary between the public and private spheres, with higher levels of participation and an approach in which public wouldn't mean necessarily state-owned. In Brazil, this new conception was inaugurated in 1995, with the reform plan named "*Plano Diretor da Reforma do Aparelho de Estado*", following the new constitutional text of 1988, where the "efficiency" where introduced as a formal principle of the public administration.

But the contemporary times seems to aggregate a further demand into the managerial approach of the public administration. As Félix and Gomes (2008, p. 2) in the article "Managerial accounting system applied to public administration: A case study on Comlurb" remember, the fiscal crisis occurred recently in Europe and United States are compelling governments around the World to "rewrite its way of thinking the Administration", considering strongly the effort to meet the needs of collectivity in face of the depressed level of available resources, not to mention the increasing demands for transparency, accountability and efficiency.

In this sense, in Spain, Lozano and Valencia (2008, p. 85) in the article "Presupuesto y public spending Secretaría General de Presupuestos y Gastos" remark that all the financial and fiscal turmoil observed recently in the World economy seems to be impacting the priorities of the public administration, urging the affected economies to search for improvement in the use of the depressed resources, trying as much as possible to keep providing quality service, in what could be called an expanded or "reloaded" version of the "New Public Management".

For heavier efficiency demands in public sector administration, tighter cost control seems to be the frequent answer, once efficiency standards depends of the government capacity of checking and vigilance on costs over time, as point out Silva (1999, p. 73) in "Governmental Accounting: a managerial approach".

Even the definition of "efficiency" in the public sector is each time more defined in terms of costs, as remarks Garcia (1997, p. 10) in the article "Evaluation of government action: points to an early conversation", where the efficiency of any scheduled government action is now currently defined as "relationship between products and costs resulting from the completion of a public action".

This microeconomic approach could seem self-evident to the perspective of an individual firm but it is less for a public institution, considering the well-established liberal tradition focusing on the macro level of market structures, where "efficiency" is perceived much more as absence, or, lack of disturbance in the market relations (Saavedra, 2006, p. 10). As Tanzi defines in an influent International Monetary Fund report (IMF 2000), "efficiency" would be the "ability of the State in achieving socioeconomic targets with the least possible distortion of the market and with minimal uptake of available resources".

The relevance of the efficiency to the public sector administration in Latin America is proportional to the weight of the public sector for those economies.

To assess its not negligible impact, we can analyze the data from Table 3, presenting in percentage of gross domestic product (GDP), the weight of public sector spending in some economies of Latin America. Based on this panorama, Mauss and Souza (2008, p. 3) also advocate the need for implementation of a control system in the public sector focused on the costs incurred.

2.3 The ABC System

The ABC system can be defined, following Martins (2006), as a costing method segmented by each specific activity, what seeks to reduce the distortions caused by arbitrary apportionment of indirect costs. However, the utility of the ABC system is not limited to product cost determination. Other kind of organizations can use this tool to control and organize its activities, dealing with goods and services, in the private or public sector.

The ABC cost system was developed during the mid-1980s in the United States mainly by the managerial efforts performed by corporate research as noticed by Cooper (2009), especially by researches undertaken by corporations such as John Deere, Union Pacific, Tektronix, Hewlett-Packard and General Motors. (Khoury and Ancelevicz, 2000, p. 57)

Documented in several case studies, the ABC system spread among the American and European corporations due to net improvement offered by this managerial tool to the strategic decision-making process (Nakagawa, 1994, p. 70). The cost determination process offered by the ABC system overcomes the limits of the traditional focus on fixed and variable cost. (Garrison, Noreen and Brewer, 2007)

In this sense, Pamplona (1997) reminds us that the cost determination can be set in function of different corporation segments, lines of production, sectors, or even individual clients or customers. For Martins (2006), with the use of ABC system by the management can clearly show the cost of each activity which covers all expenses with necessary resources to the organization performance, taking in consideration the wage costs, their social charges, depreciation, energy, materials, facilities etc.

In this sense, it is important to know then what precisely an “activity” is. In several studies and surveys that deal with ABC costing system (PAMPLONA, 1997; KHOURY and ANCELEVICZ, 2000; MARTINS, 2006; CHING, 2006; FÉLIX and GOMES, 2008) the organization activity is understood in a very similar way as defined by Nakagawa (1994, p. 42), as "a process that combines, in an appropriate manner, people, technologies, materials, methods, in its environment" .

Still according to Nakagawa (1994), focusing the cost formation process according to each specific activity as proposed by the ABC system, it is possible to improve the level of transparency and visibility and better access the contribution of each activity. As Ching (2006, p.99) complements, in the ABC system there is possible to identify the cause-effect relationship, making it possible to control the sources of costs but also identifying the availability of resources required.

Thus, pointed by Kaplan and Cooper (1998), the ABC system can be understood as a response to the inaccuracy of traditional costing system, and as a result of natural evolution of the economy of the firm, each time more composed by increased fixed costs, decreasing of direct labor, high incidence of technological change and information technology, decreasing of importance of the accounting costs and growth in the diversity of products and services.

Concerning the public sector administration, the activity-based costing system (ABC) represents a great opportunity to supply the necessary information to the public administration, once, according to Brimson (1996, p. 41), the activity-based accounting can contribute to change the shape and the dynamics of the organizations, uncovering the relationship between costs and activities, influencing then the decision process, being applicable to the indirect but also direct public administration, as remind us Slomski (2003).

3. Analysis of Results

The adoption the ABC system by the public sector in Latin America can be understood as limited and in pioneering phase, despite the significant recent advances. From the experiences observed in Uruguay, Brazil and Colombia, it is possible to identify some common trends.

Following the historical trend observed in the United States, where the pioneer initiatives were implemented by the Armed Forces, the defense administration in the South American countries also were responsible for some experiences, especially in Brazil. In 2004, the Brazilian Army implemented a central cost supervision unity, called SISCUSTOS. But connected to the managerial innovations of transnational corporations, the Brazilian Central Bank (BaCen) has adopted in 2005 a “cost commission” to identify the process of cost formation in its activities.

In Colombia, with its well rooted tradition of modern public administration, the ABC system has been spread in several agencies and public enterprises, especially those supplying public services as sanitation water and electricity.

This was result of a decree set by the Superintendent of Public Services determining the implementation of the ABC system in all public service companies. One of the best examples are the efficient "EEPPs", the municipal public enterprises, which had attained a high degree of managerial rationality, and the adoption of ABC systems is present and used to the tariffs determination as well the subsides policies.

The regulatory agencies and concessionaires of the telecommunications sector, such as ENTELSA and Telefonica de Pereira, they are also using the ABC system to determine the sector tariffs. In the Colombian direct administration, the best example is the system developed in 2001 by the government of the capital district of Bogota, covering three quarters of all district institutions, a process starting with the district public hospitals.

Important contribution has been made by the "Corporación Calidad", a non-profit institute and research center created in 1991 oriented for development of managerial techniques in the public sector. Among the important projects, the institute carries out training programs to the implementation of the ABC system in public institutions.

In Uruguay, when the wide program of State reform was introduced in the 1990s by the "Comité Ejecutivo para la Reforma del Estado" (CEPRE), the ABC system was highlighted as one of the most important tools to guarantee the managerial approach expected to be implemented in the Uruguayan public sector.

After that, the system became the most important tool to the prices and tariffs determination by the public service suppliers. But the program was abandoned in 2006 and the emphasis on the activity costing approach has decreased.

4. Final Remarks

The interdependence between national economies fostered by the global financial and productive networks have increased the level of competition and the importance of learn from the best practices is becoming "vital" to the organizations. This trend has been encouraging the market players to "benchmark" the most successful global management technologies, in order to find alternatives to the fierce competition.

In the search for alternatives to cost reduction and also to the process improvement, corporation but also States and governments are nowadays rethinking their models, trying to improve the general economic environment or only to meet the needs of its citizens, consumers of public goods. The wave of State reform initiated in the 1980s have been stated this values of effectiveness, whose have been over-emphasized in the context of the financial and fiscal crisis of 2008. The control of the costs of the public sector seems more important yet.

In this context, this study indicates that with the use of ABC costing management information system by the public sector in Latin America is still in halfway or in its early stages. Despite its consensual capacity to promote higher degrees of transparency and accountability of public spending and disseminate a "cost culture" in the public administration, the dissemination seems to depend, as pointed out by previous researches in the area, on the existence of factors such as:

a) qualified administrative staff;

b) reduced levels of populist culture in the public administration;

c) consistent demands from the civil society in terms of transparency, accountability and rationality of public services management;

d) cooperation between academic research institutions and public administration.

In this sense, future studies may verify the level of adoption of Balanced Score Card (BSC) by the public sector of these countries and their possible integration with the ABC system, to complement the management information that the Government organizations need strategic level for decision-making.

References

Alonso, M. (1998). *Cost in public service*, Text for discussion no.31. Brasília: ENAP, Outubro.

Aucoin, P. (1990). Administrative Reform in Public Management: paradigms, principles, paradoxes and pendulums. *Governance*, 3(2), 115-137. http://dx.doi.org/10.1111/j.1468-0491.1990.tb00111.x

Bagura, Y. (2000). Public Sector Restructuring. Ocassional Paper no. 3. Geneva: United Nations Research Institute for Social Development.

Barzelay, M. (2001). *The New Public Management,* Los Angeles: University of California Press.

Caulfield, J. (2004). Measuring Autonomy in Social Security Agencies: four countries comparison. *Public Administration and Development*, 24, 137-145. http://dx.doi.org/10.1002/pad.319

Caulfield, J., & Larsen, H. (eds.) (2002). *Local Government at the Millennium*, Berlin: Leske Budrich Opladen. http://dx.doi.org/10.1002/pad.319

Christensen, T., & Lægreid, P. (eds.) (2001). *New Public Management. The transformation of ideas and practice,* Aldershot, Ashgate.

Cooper, R., & Kaplan, R. S. (1998). *Cost and performance*, S.Paulo: Futura.

Custeio Baseado em Atividades. (1994). S. Paulo: Atlas.

Félix, C. L., & Gomes, J. (2008). Managerial accounting system applied to public administration: a case study on Comlurb. *RIC-Revista de Informação Contábil,* 2(2), 1-18.

Forrssell, A. (2001). Reform Theory Meets New Public Management. *CHRISTENSEN: New Public Management,* 261-287.

Garcia, R. C. (1997). *Evaluation of government action: points to an early conversation,* Brasília: mimeo.

Gomes, J. S., & Salas, J. M. (2001). *Management Control: a contextual and organizational approach,* S. Paulo: Atlas, 3rd edition.

Gregory, R. (2001). Transforming Governmental Culture: a sceptical view of New Public Management. In: CHRISTENSEN (2001): *New Public Management.*

Hansen, D. R., & Mowen, M. M. (2001). *Cost Management.* S.Paulo: Pioneira- Thomson Learning.

IFAC. (2000). *International Federation of Accountants.* Perspectives on cost accounting for government: international public sector study. New York: IFAC.

IMF. (2000). *International Monetary Fund Report 2000*. Washington: IMF.

Khoury, C. Y., & Ancelevicz, J. (2000). Controvérsias acerca do sistema de custos ABC. *Revista de Administração de Empresas*, 40(1), 56-62.

Lozano, M. R., & Valencia, P. (2008). *Presupuesto y gasto publico*, Secretaría General de Presupuestos y Gastos, Instituto de Estudios Fiscales.

Mauss, C., & Souza, V. (2008). *Cost management applied to the public sector:* a model for measurement and analysis of the efficiency and effectiveness of Government. S. Paulo: Atlas.

Nunes, M. A. (1995). *Custos no Serviço Público,* S. Paulo: Maré.

Ricupero, R., & Barreto, F. M. (2007). A importância do investimento direto estrangeiro no Brasil. In: ALMEIDA 2007: *Internationalização das Empresas Brasileiras*. Rio de Janeiro: Elsevier.

Rocha, A., & Freire, C. (2003). The paradox of cultural distance: the Boticario in Portugal. *ROCHA*: *The new frontiers: the globalization of Brazilian companies.*

Silva, L. M. (2004). *Contabilidade Pública: abordagem da nova administração pública*, S.Paulo: Atlas, 7th ed.

SOF – Secretary to the Federal Budget, Brazilian Government. (2008). Cost Information systems in the Federal Government: guidelines for the development and deployment of methodologies and systems of generation and employment of cost information in federal Government, 2008. Available in < https://www.portalsof.planejamento.gov.br/consultacustos >. access in November 12.

UNCTAD. (2003). *The World Investment Report 2003.* Geneva: Unctad.

WERNKE. (2005). Rodney Wernke. Activity based costing (ABC) applied to the processes of purchase and sale of goods distributor. *Revista de Contabilidade Financeira da USP*. S.Paulo, no.38, p. 74-89, May.

Table 1. Degree of Openness of Selected Economies

country	degree
Brazil (in 2005)	20 %
Brazil (in 1995)	10 %
Colombia	31 %
United States	25 %
Uruguay	25 %

Source: Unctad 2006.

Table 2. Participation of TNC in Industrial Production

country	participation
Brazil	32 %
Colombia	29 %
United States	11 %
Uruguay	11 %

Source: Unctad 2006.

Table 3. Percentage (%) of GDP (Gross Domestic Product) on Public Expenditure on Goods and Services

Countries	Year			
	1990	1995	2000	2005
Argentina	17,8	17,6	17,5	17,3
Bolivia	18,4	18,8	18,6	19,2
Brazil	30,8	21,5	21,6	22,3
Chile	22,9	17,7	17,9	17,8
Colombia	15,5	19,9	27,4	28,2
Costa Rica	21,1	15,0	15,0	15,6
Ecuador	24,8	23,2	20,9	21,2
Guatemala	14,5	13,9	18,6	20,0
Mexico	15,3	15,5	13,4	13,3
Paraguay	12,8	16,0	20,5	15,7
Peru	16,3	15,7	17,5	16,9
Uruguay	22,8	18,6	18,5	19,2
Venezuela	15,8	16,0	15,4	18,8

Source: Heston, Summers and Aten quoted by to Saavedra (2006, pp. 10)

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The Use of Runs Test in Amman Stock Exchange

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Abstract

This paper applies runs test - runs up and down, distributions of runs by length, and runs above and below -to examine whether ASE is weak form efficient. The empirical results obtained in this paper suggest that the price behavior in ASE does not follow the random walk model over time. However, this does not necessarily imply a violation of weak form efficiency (vice versa is not correct).

Keywords: Market efficiency, Runs test, Random Walk model, Amman Stock Exchange

1. Introduction

The theory of market efficiency involves defining an efficient market as one in which trading on available information fails to provide an abnormal profit. Three levels of market efficiency have been defined; firstly, the weak form of the efficient market hypothesis which claims that prices fully reflect the information implicit in the sequence of past prices. Secondly, the semi-strong form of the efficient market hypothesis which asserts that prices reflect not only past prices but all relevant information that is publicly available. Researchers have tested this by looking at specific items of news such as announcements of earnings and dividends, forecasts of company earrings, changes in accounting practices, and mergers. Thirdly, the strong form of the efficient market hypothesis which asserts information that is known to any participant is reflected in market prices; hence, prices reflect not just public information but all the information that can be acquired by painstaking fundamental analysis of the company and the economy. In such a case, prices would always be fair and no investor would be able to make consistently superior forecasts of stock prices. Most tests of this view have involved an analysis of the performance of professionally managed portfolios.

The efficient market hypothesis yields a variety of testable predictions about the behaviour of financial asset prices and returns. The following are examples of these predictions (Beechey, Gruen, and Vickery 2000):

- Asset prices move as random walks over time, which test the weak form level. Technical analysis should provide no useful information; also test the weak form level.
- New information is rapidly incorporated into asset prices, and currently available public information cannot help in achieving abnormal returns, which tests the semi-strong level by using the event study.
- Fund managers cannot outperform the market, testing the strong form level.
- The actual asset price at any point in time will be a good estimate of its fundamental value, testing also the strong form level.

In order to investigate whether asset prices move as random walk over time, the hypothesis that successive price changes are independent must be tested. Different approaches have been utilised in literature. One is an approach

that relies primarily on common statistical tools, such as the runs test which determines whether successive price changes are independent, and consequently, whether the market is weak-form efficient. This approach has been used excessively and produced evidence of important independence in series of successive price changes in developed markets. The non-parametric runs test determines whether successive price changes are independent, but unlike its parametric equivalent serial correlation test, the runs test does not require returns to be normally distributed (Levene, 1952).

1.1 Review of Empirical Studies

This section presents a review of the empirical studies for runs test. It starts with studies conducted in developed financial markets and follows this with a review of studies conducted in emerging markets, then a review of studies conducted in the ASE.

1.1.1 Developed Markets

The early studies testing for weak form efficiency started on developed markets and applied runs tests. Generally, these studies supported the weak-form efficiency of the market, where it found an insignificant difference between the expected and observed number of runs, hence, the null hypothesis that the daily returns are random couldn't be rejected. Kendall (1953) stated that "an analysis of stock-exchange movements revealed little serial correlation within series and little lag correlation between series. Unless individual stocks behave differently from the average of similar stocks, there is no hope of being able to predict movements in the exchange for a week ahead without extraneous information". Similar conclusions have also been reached by Fama (1965). This study used the daily prices for the thirty stocks of Dow-Jones Industrial Average over the period 1957-1962 to test the empirical validity of the independent hypothesis of the random walk model. Serial correlation and runs tests (in addition to other technical tests) were applied to daily, four-day, nine-day, and sixteen-day price changes. The results showed little evidence, either of serial correlations or, from the various runs tests, of any large degree of dependence in price changes. Hence, dependency in price changes can not explain the departures from normality that has been observed in the empirical distribution of price changes. Cooper (1982) studied world stock markets using monthly, weekly and daily data for 36 countries. He examined the validity of the random walk hypothesis by employing correlation analysis, runs tests and spectral analysis. With respect to the USA and the UK, the evidence supported the random walk hypothesis.

In general, most empirical studies conducted in developed markets have tended to uphold weak form efficiency and thus no abnormal return would occur by using past prices.

1.1.2 Emerging Markets

Although it is generally believed that emerging markets are less efficient than developed markets, the research findings on emerging markets are actually quite mixed. There are different studies in favour of weak-form efficiency in developing markets which applied runs tests technique. Branes (1986) tested the applicability of the random walk hypothesis to the Kuala Lumpur Stock Exchange, using the traditional statistical techniques: serial correlation, runs, and spectral analysis. The Kuala Lumpur Stock Exchange exhibits a high degree of weak-form efficiency. Dickinson and Muragu (1994) used weekly prices over ten years of the 30 most actively traded equities on the Nairobi Stock Exchange. They failed to find evidence inconsistent with weak-form efficiency in the stock exchange by means of both runs tests and Q-test statistics, but suggested that a number of studies must be carried out on any market using a variety of methodologies to draw firm conclusions about weak-form efficiency.

Urrutia (1995) tests showed opposite results. He used variance-ratio tests and runs tests to investigate random walk and weak-form market efficiency in four Latin American emerging stock markets: Argentina, Brazil, Chile, and Mexico. Results from the variance-ratio estimates obtained, assuming homoskedasticity, reject the random walk hypothesis for the four Latin American markets. However, the runs tests indicate that the four Latin American markets are weak-form efficient. Urrutia suggested that investors might not be able to detect patterns in stock prices and develop trading strategies that would allow them to earn abnormal returns, as one interpretation for these results.

El-Erian and Kumar (1995) also found some departures from weak-form efficiency in Middle Eastern stock markets, but emphasise the serial dependence is sufficiently weak that it likely has little value in predicting future prices. Their finding is consistent with that of Butler and Malaikah (1992), who found statistically significant autocorrelation in the stock markets of Kuwait and Saudi Arabia. Nourrrendine Kababa (1998) has also examined the behavior of stock prices in the Saudi Financial Market, seeking evidence for weak-form efficiency, but found that the market is not weak-form efficient. Poshakwale (1996) investigated the weak form efficiency and the day of week effect in the Bombay Stock Exchange using runs test and serial correlation coefficient tests. The results of runs test and serial correlation coefficient tests indicate a nonrandom nature of the series and, therefore, violation of weak

form efficiency in the BSE. The other null hypothesis that there is no difference between the returns achieved on different days of the week is also rejected as there is clear evidence that the average returns are different on each day of the week. Mobarek (2000) examined the weak-form efficiency in Dhaka Stock Exchange using the daily price indices of all the listed securities on the DSE for the period 1988 to 1997. The results of both non-parametric tests (Kolmogrov –Smirnov normality test and run test) and parametric tests (Auto-correlation test, Auto-regression, ARIMA model) provided evidence that the share return series do not follow the random walk model, and the significant autocorrelation co-efficient at different lags reject the null hypothesis of weak-form efficiency.

Moustafa (2004) examines the behavior of stock prices in the United Arab Emirates (UAE) stock market using daily prices of 43 stocks included in the UAE market index for the period October 2, 2001 to September 1, 2003. He finds that the returns of the 43 stocks do not follow normal distribution. However, the results of runs tests show that the returns of 40 stocks out of the 43 are random at 5% level of significance. Although the UAE stock market is newly developed and it is still very small, also suffering from infrequent trading, according to his results, the UAE is found to be weak-form efficient.

Pandey (2003) analysed the efficiency of the Indian stock markets by using three Indian stock indices to test the efficiency level in Indian stock market and the random walk nature of the stock market by using the runs test and the Auto Correlation Function ACF (K) for the period from January 1996 to June 2002. The study found that the series of stock indices in the Indian stock market biased the random time series and do not confirming the Random Walk Theory.

Sharma et al. (2009) examined the weak-form efficiency of eleven (11) securities listed on the BSE using weekly data from July 2007 to October 2007 by employing runs test and auto-correlation tests. The study concludes that the BSE is weak-form efficient and the stock prices are having very scrimpy effect on future prices which implies that an investor cannot reap out abnormal profits as the current share prices already reflect the effect of past share prices.

Pradhan et al. (2009) in their paper tried to examine the Efficient Market Hypothesis (EMH) in its weak - form by employing the unit root test on the sample of daily stock returns of National Stock Exchange (NSE) and Bombay Stock Exchange (BSE). The sample period lies between Jan.2007 to Jul.2009. The study reveals that Indian Stock market is not weak - form efficient.

Worthington and Higgs (2004) find that Germany and Netherlands are weak form efficient under both serial correlation and runs tests, while Ireland, Portugal and the United Kingdom are efficient under one test or the other. Thus, rests of the markets do not follow a random walk Tas and Dursonoglu (2005) have confirmed the inefficiency result for Turkey using daily stock returns of ISE 30 indices from the period 1995 to 2004. Dickey-Fuller unit root and runs tests were used in their studies and the results of both tests reject random walk hypothesis in ISE.

Akinkugbe (2005) finds stock markets in Botswana to be weak and semi-strong form efficient. His data includes 738 weekly observations for the period June 1989 to December 2003. Autocorrelation, and Augmented Dickey-Fuller and Phillip-Perron unit root tests were used to investigate the weak form of EMH in Botswana stock exchange. In his study, autocorrelation test show evidence of no serial correlation and the results of both unit root tests indicate a stationary process for stock returns, therefore implying weak-form efficiency.

Using the serial correlation, runs and unit root tests Abeysekera (2001) indicates that the Colombo Stock Exchange (CSE) in Sri Lanka is weak-form inefficient. His data include daily, weekly and monthly returns of the Sensitive Share Index (based on market prices of 24 blue-chip companies listed on the CSE) and a 40-security value weighted index for the period January 1991 to November 1996. The results of three tests consistently reject the random walk hypothesis.

(Abraham et al. 2002) they all use variance ratio tests and runs test on the financial data of different countries for testing random walk hypothesis and found week form efficient these markets are and follow a random walk.

Hassan et al. (2006) conduct a test of efficiency in seven European emerging stock markets. They use International Finance Corporation's weekly stock index data for the period December 1988 through August 2002. Several methods used in their studies including Ljung-Box Q-statistic, runs, and variance ratio tests. According to their results, except Greece, Slovakia, and Turkey, markets in Czech Republic, Hungary, Poland and Russia are found to be unpredictable.

Dragotă et al. (2009) analyze the returns of 18 stocks listed at the BSE first category and of the Romanian capital market indices.11 The stocks and indices are monitored from their listing (respectively the indexes construction) date to the end of 2006. Dragotă et al. (2009) focus on the weak form efficiency, according to which all of the past prices information is incorporated into the current price and, consequently, there could not be obtained systematic abnormal returns based on historical information on prices. The investigation on the weak form of the efficient

market hypothesis is based on the following tests of the random walk hypothesis: the Cowels-Jones test, the runs test and the Multiple Variance Ratio – MVR – approach.

Filis (2006) tested the efficiency level of ASE by performing several tests for the period 2000-2002. These include unit roots (ADF) runs and GARCH effects tests. Furthermore he used the Wilcoxon Signed Rank test for the equality of implied versus historic volatility. He rejected the semi-strong form of efficiency as he found evidence of volatility clustering whereas he accepted the weak form as he found that the returns for this period followed a random walk.

Briefly, the previous studies cannot support or contradict the weak form efficiency in emerging markets. Much work must be conducted to investigate price dynamics in emerging markets. It is interesting to find if ASE is weak-form efficient and to what extent, and to explore the return generating process by using serial correlation and runs tests.

1.1.3 ASE

Few studies investigated the weak form efficiency of ASE by using the conventional tests. El-Erian and Kumar (1994) analyzed the development of equity markets in selected Middle Eastern countries, and evaluated their informational efficiency. The analysis focused on a sample of six countries consisting of: relatively active markets, (Jordan and Turkey), an established but less active market (Eygpt), and more recently established markets (Iran, Morocco, and Tunisia). A range of quantitative indicators, including market capitalization and concentration, price earnings ratios, price volatility, and the extent of correlation with industrial country markers, are applied. A quantitative analysis of the efficiency of selected markets in the region, and a comparison of the efficiency of these markets with a number of other emerging markets, are also undertaken. The results show that there are significant differences across these countries in the importance and characteristics of equity markets. For example, the study measured the volatility of the Jordanian and Turkish markets and compared it with other emerging and developed markets. The emerging markets have been found to be more volatile than the developed markets. Nevertheless, the Jordanian market exhibits the lowest volatility among the emerging markets. The paper also examined the degree to which emerging equity markets are efficient in pricing stocks, through assessing whether stock prices display any systematic patterns or whether they are indistinguishable from random walk. The empirical evidence is based on the serial correlation, for the first ten lags, and the non-parametric runs technique. Daily and weekly data were used. For the daily series for Jordan, the results indicate that the first order serial correlation (0.194) is highly significant, and hence, the random walk model does not hold. For the higher order coefficients, the 3rd, 4th, and 6th are significant. In the case of the weekly data, the pattern is different: the serial correlation coefficients are not statistically significant only for the 4th lag and at the 10% level.

The runs test is performed by comparing the actual number of runs (defined as a sequence of price changes of the same sign preceded and followed by price changes of different signs) with the expected number of runs on the assumption that price changes are independent. If the observed runs are not significantly different from the expected number of runs, then the inference is that successive price changes are independent. The results of the runs analysis for both the daily and weekly data indicate that the null hypothesis of independence could be rejected at the 1% level.

Another study for Karemera, Ojah, and Cole (1999) reported different interesting results. They used the runs test and the single and multiple variance-ratio tests to examine the stochastic properties of local currency –and US dollar-based equity returns in 15 emerging capital markets. The results indicate that the majority of the emerging equity series analysed are consistent with the RWH and weak form efficient when both local currency-based data and exchange rate-adjusted data are used. The data comprises monthly national stock price indices expressed in both domestic (local) currency and US dollars from 1987:12 to 1997:5, and obtained from Morgan Stanley Capital Information (MSCI) files for emerging markets. The study also provides some descriptive statistics on returns of the stock indices.

According to Karemera, Ojah, and Cole (1999), and El-Erian and Kumar (1994) results, Jordan is found to have the lowest standard deviation (a measure of asset's risk) among the emerging markets covered in the study. However, according to the runs test statistics, the hypothesis of independence can not be rejected at the 5% level for the Jordanian equity return series, and also for most of the emerging markets covered in the study, for both US dollar-based data and local currency-based data. Hence, the Jordanian market and most of the emerging markets covered in the study are weak-form efficient.

Karemera, Ojah, and Cole present different possible reasons for the presence of a positive and/or negative serial correlation when a market is, at the same time, documented to be weak-form efficient. For example, infrequent or nonsynchronous trading patterns can yield a positively autocorrelated stock price series behaviour. When small-capitalized firms trade less frequently than large-capitalized firms, information is impounded first into

large-capitalized firms' prices, and then small- capitalized firms', with a lag; and this lag induces a positive serial correlation in the index series that contain these distinct capitalized groups of stocks. Given the market concentration of the top large companies whose stocks dominate the emerging market indices, this explanation is not far-fetched. The effects of government interventions can also be another reason for the positive autocorrelation in emerging equity markets' series. Furthermore, they reported that RWH seems to be sensitive to the test observation intervals of the series, and the testing methodology used. On the other hand, the results of variance ratio tests suggest that the Jordanian market does not follow a random walk for either US dollar-based data or local currency-based data for all intervals, given that the observation intervals q=2, 4,8,16 months, with a base of one month, variance ratio estimates are computed for two-month, four-month, eight-month, and sixteen month observation intervals.

Omet (1990) examined the Jordanian market in its beginings, by using the daily prices for most active sixteen shares, and covered the period from 1st Jan. 1979 to 31st Dec. 1986. He applied the serial correlation model, runs analysis, distribution of runs by length, and filter technique. The price time series of each of the sixteen shares are used to calculate the sample correlation coefficients for daily changes in log prices for the first five lags. For the first lag, the coefficients for all shares are significant and range from +0.269 to -0.061. For the other lags, the correlation coefficients are close to zero and most of them are statistically insignificant. Hence, results suggest that the price changes reflect some degree of significant positive dependency patterns. The runs test was performed for the sixteen shares for the 1-day and 2-day price changes. The number of actual runs for the 1-day price change was found to be less than the number of expected for all shares, thirteen of these differences are significant. However, regarding the 2-day price changes, fifteen shares were found to have actual runs less than expected, but these differences are not significant. Omet concluded that the 1-day price changes reflect positive dependency patterns, which is in agreement with the serial correlation model's results.

1.2 Data and Descriptive Statistics

1.2.1 Data

Data tested comprised of the daily prices of the five indices in ASE from 1st January 2000 to 31st December 2008 .

1.2.2 Descriptive Statistics

Summary statistics for the ASE indices are presented in Table 1.1. (see appendix 1) The daily return for each index is calculated as: $\ln(p_t) - \ln(p_{t-1})$ where $\ln(p_t)$ is the natural logarithm of the index at time (day) t. Dividends are assumed away (Campbell *et al*., 1997). Of the five indices, the bank index has the highest average return of 0.00035 over the time period 2000-2008, while the industry index has the lowest and the only negative mean daily average return of (-0.00014). In case of standard deviation of stock returns, the bank and industry sectors have the greater fluctuations. Whilst one of the basic assumptions of random walk model is that the distribution of the return series should be normal, it can be seen from Table 1.1 that the frequency distribution of the return series for each index is not normal. The normal distribution has a skewness coefficient of zero and a kurtosis coefficient of 3. Skewness is a measure of symmetry, or more precisely, lack of symmetry. A distribution, or data set, is symmetric if it looks the same to the left as it does to the right of the centre point. The formula for the Skewness is:

$$S = \frac{\frac{1}{T}\sum_{t=1}^{T}(y_t - \bar{y})^3}{\sigma^3} \tag{1}$$

Where $\bar{y}$ is the mean, σ is the standard deviation, and T is the number of observations.

Negative values for skewness indicate data that are skewed left, and positive values for skewness indicate data that are skewed right. By skewed left, we mean that the left tail is heavier than the right tail. Similarly, skewed right means that the right tail is heavier than the left tail. Some measurements have a lower bound and are skewed right. For example, in reliability studies, failure times cannot be negative.

Regarding ASE indices, the skewness coefficient is positive for all indices. These lie in the opposite direction to that commonly manifested by most stock markets (see, for example, Harvey and Siddique, 1999; Peiró, 1999; and Premaratne and Bera, 2001).

Kurtosis is a measure of whether the data is peaked or flat, relative to a normal distribution. That is, data sets with high kurtosis tend to have a distinct peak near the mean, decline rather rapidly, and have heavy tails. Data sets with low kurtosis tend to have a flat top near the mean rather than a sharp peak. A uniform distribution would be the extreme case. The formula for Kurtosis is:

$$K = \frac{\frac{1}{T}\sum_{t=1}^{T}(y_t - \bar{y})^4}{\sigma^4} \tag{2}$$

where $\bar{y}$ is the mean, σ is the standard deviation, and T is the number of observations.

The kurtosis of a normal distribution is 3. If the distribution has thicker tails than does the normal distribution, its kurtosis will exceed three. A positive kurtosis indicates a peaked distribution, while a negative kurtosis indicates a flat distribution.

The kurtosis coefficient is higher than 3 for all indices, indicating a leptokurtic distribution. A kurtosis higher than 3 indicates a leptokurtic distribution, while one lower than 3 indicates a playkurtic distribution (Parkinson, 1987). Hence, skewness and kurtosis values for the ASE indices return series deviated from the normal distribution both on skewness and kurtosis values and at 1% significant level, indicating that the distribution of indices return series are not normal. In light of the previous results, and to assess the extent of non-normality in the distributions of the indices return series, the Jarque-Bera statistic is used to test whether each series is normally distributed. The test statistic measures the difference of the skewness and kurtosis of the series with those from a normal distribution.

Under the null hypothesis of a normal distribution, the Jarque-Bera statistic is distributed as χ^2 with 2 degrees of freedom. The reported probability is the probability that a Jarque-Bera statistic exceeds (in absolute value) the observed value under the null hypothesis; a small probability value leads to the rejection of the null hypothesis of a normal distribution. The formula for Jarque-Bera is:

$$JB = \frac{T-k}{6}\left[S^2 + \frac{1}{4}(K-3)^2\right] \tag{3}$$

where T is the number of observations, k is zero for an ordinary series and the number of regressors when examining residuals to regression equation, S is skewness and K is kurtosis (Bera, 1981). As shown in Table 1.1, the probabilities, for the *JB* test, for the indices return series are all less than 0.0001, which is statistically significant at 1% level and confirms that the distribution of the daily price indices of the ASE is not normal.

This result supports earlier findings that the emerging market returns are not normally distributed (Harvey, 1995). Bekaert and Harvey (2002) reported the skewness and excess kurtosis of twenty emerging markets, including Jordan, with the longest history in the EMDB, the IFC composite portfolio and the MSCI world market portfolio (pre-1990 and post-1990).

It is noticeable that the return series of the ASE has a positive skewness, which contradicts the IFC composite portfolio and the MSCI world market portfolio as well as most of other emerging markets. The average monthly excess of kurtosis is consistent with other emerging markets and very close to the world index.

2. Non-Parametric Runs Test

The runs test is an approach to determine whether successive price changes are independent; the normality assumption of distribution is ignored by this test. The null hypothesis for the runs test is that the observed series is a random series. A run is defined by Siegel (Siegel, 1956) as: "a succession of identical symbols which are followed or preceded by different symbols or no symbol at all". For the purpose of this test, runs up and down, distribution of runs by length, and runs above and below are applied.

2.1 Runs Up and Down

A run is counted every time the price series changes its sign. There are three possible changes: positive (+), negative (-), and zero changes (0). A run of length i is defined as i consecutive + or – or 0. In other words, a plus run of length i is a sequence of i consecutive positive price changes preceded and followed by either negative or zero changes. For example, the sequence of daily prices of (166.05, 166.38, 165.78, 165.20, 164.57, 164.01, 163.97, 164.03, 164.86, 164.86, 164.28, 163.79, 164.47, 164.54) has 6 runs (+, -, +, 0, -, +) with lengths of (1, 6, 2, 1, 1, 2) respectively.

This test examines if the direction of one observation influences the direction taken in later observations. The run's test compares the observed number of runs with the expected number of runs, which are computed under the assumption that prices fluctuate randomly and independently (Fama, 1965):

$$Expected\ Runs = \left[N(N+1) - \sum_{i=1}^{3} n_i^2\right] \Big/ N \tag{4}$$

Where N is the total number of return observations, and n_i is the number of price changes of each sign.

The standard error of the series (σ) of runs can be shown to be (Fama, 1965):

$$Standard\ Error = \left(\frac{\sum_{i=1}^{3} n_i^2 \left[\sum_{i=1}^{3} n_i^2 + N(N+1) \right] - 2N \sum_{i=1}^{3} n_i^3 - N^3}{N^2 (N-1)} \right)^{1/2} \quad (5)$$

The difference between the actual number of runs and the expected number of runs is examined for significance. Thus the difference between the actual number of runs, R, and the expected number, m, can be expressed by means of the usual standardized variable,

$$Z = \frac{\left(R + \frac{1}{2} \right) - m}{\sigma_m} \quad (6)$$

where the half in the numerator is a discontinuity adjustment. For large samples, Z will be approximately normal with a mean (0) and a variance (1). When the difference is found to be significant, this means that daily returns are not random and that there is an opportunity to make abnormal returns. If the actual number of runs are significantly less than the expected value, this indicates the market's overreaction to information, while a higher number of runs reflects a lagged response to information (Poshokwale, 1996).

2.2 Empirical Results

The non-parametric runs test is considered more appropriate than a parametric serial correlation test as the returns data does not conform to the normal distribution (Jarque-Bera test statistic is reported in Table 1.1). The standard normal Z-statistic can be used to test whether the actual number of runs is consistent with the independence hypothesis. If the Z value is greater than or equal to ±1.96, the null hypothesis at the 5% level of significance is rejected (Sharma and Kennedy, 1977).

When the actual number of runs exceeds (falls below) expected runs, a positive (negative) Z value is obtained. A positive (negative) Z value indicates negative (positive) serial correlation in the return series. As can be seen from Table 1.2, the Z statistics of the daily market return is greater than ±2.64 and negative for all indices. This means that the observed number of runs is significantly fewer than the expected number of runs at the 1% level of significance. Therefore, the null hypothesis that the return series of the indices follow a random walk can be rejected for all series.

Even though the empirical results rejected the random walk, runs tests are not considered a sophisticated method for identifying movements, since the termination of the movement is simply predicted when the price level has temporarily changed direction, regardless of the size of the price change that caused the change in sign. It is also consistent with other emerging market studies. For example, Poshokwale (1996) reported that the daily return series in the Indian, Philippine, Malaysian, and Thailand market produced an actual number of runs significantly lower than the expected number of runs. El-Erian and Kumar (1994) and Omet (1990) reported similar results for the Jordanian market, even though the study periods were different.

The next step is to analyze the difference between the actual and expected number of runs using the distribution of runs by length (number of days), in other words, by examining the differences-in length-between the actual and expected number of each sign.

2.2.1 Distribution of Runs by Length

When the differences between the actual and expected number of runs is significant, the distribution of runs by length analysis provides a more detailed description and answers the following question: given the total actual number of runs of each sign, how would we expect the totals to be distributed among runs of different lengths, and what is the actual distribution? In other words, if the signs of the price changes are generated by an independent process with their respective probabilities of P(+), P(-) and P(0), we are required to examine the differences (in length) between the actual and expected runs of each sign (TSP software is used to perform this test as shown in Appendix 2).

Depending on the actual number of positive price changes (NP(+)) , negative price changes (NP(-)), and zero price changes (NP(0)), the probability of positive price change [P (+)] to occur would be: (Fama, 1965)

$$P(+) = NP(+) / \left[NP(+) + NP(-) + (NP(0)) \right] \quad (7)$$

and P (-), P (0) would be

$$P(-) = NP(-) / \left[NP(+) + NP(-) + (NP(0)) \right] \quad (8)$$

$$P(0) = NP(0)/\left[NP(+) + NP(-) + (NP(0)\right] \tag{9}$$

The expected proportion of positive runs of length i (where i =1,2,3,…, α) would be $P(+)^{i-1}\left[1 - P(+)\right]$ (Fama, 1965). In other words, given that a positive run has occurred, this proportion is equivalent to the conditional probability of positive runs of length i(the sum of the conditional probabilities for positive runs of all length will be one). Similarly, this is applied for negative and zero runs to get the expected distributions by length of the total actual number of runs of each sign: $P(-)^{i-1}\left[1 - P(-)\right]$ and $P(0)^{i-1}\left[1 - P(0)\right]$respectively. The expected distributions, by length, of the total actual number of runs of each sign could be calculated by using (1.10), (1.11), and (1.12). The expected numbers of positive, negative, and zero runs of length i (where i =1,2,3,…, α) are calculated as: (Fama, 1965)

$$\overline{R}_i(+) = R(+)P(+)^{i-1}\left[1 - P(+)\right] \tag{10}$$

$$\overline{R}_i(-) = R(-)P(-)^{i-1}\left[1 - P(-)\right] \tag{11}$$

$$\overline{R}_i(0) = R(0)P(0)^{i-1}\left[1 - P(0)\right] \tag{12}$$

where $\overline{R}_i(+), \overline{R}_i(-)$ and $\overline{R}_i(0)$are the expected numbers of positive, negative and zero runs of length i and $R(+)$, $R(-)$and $R(0)$are the total actual numbers of positive, negative and zero runs.

2.2.1.1 Empirical Results

Table 1.3 reports, for each type of run, the probability of a run of each length, the expected number of runs of each length, and the actual number of runs of each length for the five indices. It is noticeable that all indices produced similar results, and that there are very few long runs. The most interesting point is that, for the runs of length 1 day, the actual number of runs is predominantly less than the expected number of runs. However, for runs of length 4 or more days, the actual number is mostly greater than the expected number. These results support the Omet (1990) results and previous runs test analyses, and suggest that the indices price series could not be characterised as random walk. The next chapter will investigate whether these short term trends of similar price changes could be utilized by a trader to increase the expected profit, by applying the filter Runs Above and Below

A run is counted every time the price series rises above or falls below a cut point measure (which may be the mean, median, mode, or any other chosen value). Each price observation is classified with either a + or - to indicate whether the price is above or below the cut point (theoretically, an observation could equal the cut point, and in this case according to SPSS package, the observation is classified as +). After classifying the observations, they are investigated for "runs". Unlike the runs before, the runs sought this time are of consecutive numbers that share the property of being above or below the cut point. Then, the number of numbers above the cut point is counted, as well as the number of number*s* below the cut point. Lastly, the total number of runs is counted. The computation of the cutting point, number of runs, and significance level, are as follows: (according to the SPSS guide as this package is the used to perform the test).

2.3 Computation of Cutting Point

The cutting point which is used to dichotomize the data can be specified as a particular number, or the value of a statistic which is to be calculated. The possible statistics are:

$$Mean = \sum_{i=1}^{N} X_i / N \tag{13}$$

$$Median = \begin{cases} \left(X_{(N/2+1)} + X_{(N/2)}\right)/2 & if\ N\ is\ even \\ X_{((N+1)/2)} & if\ N\ is\ odd \end{cases} \tag{14}$$

where the data are sorted in an ascending order from $X_{(1)}$, the smallest, to $X_{(N)}$, the largest. The mode is the most frequently occurring value. If there are multiple modes, the one largest in value is selected.

2.3.1 Numbers of Runs:

For each observation, the difference between the observation and the cut point is computed,

$$D_t = X_t - Cutpoint \tag{15}$$

If $D_t \geq 0$, the difference is considered positive. Otherwise it is negative. The number of times the sign changes, that is, $D_t \geq 0$ and $D_{t+1} < 0$, or $D_t < 0$ and $D_{t+1} \geq 0$, as well as the number of positive $\left(n_p\right)$ and negative $\left(n_a\right)$ signs, are determined. The number of runs *(R)* is the number of sign changes plus one.

2.3.2 Significance Level:

The sampling distribution of the number of runs *(R)* is approximately normal with

$$\mu_r = \frac{2n_p n_a}{n_p + n_a} + 1 \tag{16}$$

$$\sigma_r = \sqrt{\frac{2n_p n_a\left(2n_p n_a - n_a - n_p\right)}{\left(n_p + n_a\right)^2\left(n_p + n_a - 1\right)}} \quad \mathbf{2} \tag{17}$$

The two-sided significance level is based on

$$z = \frac{R - \mu_r}{\sigma_r} \tag{18}$$

2.4 Empirical Results

The observed mean, median, and mode are used as cut points. Cases with values less than the cut point are assigned to one group, and cases with values greater than or equal to the cut point are assigned to another group. One test is performed for each cut point chosen.

Tables 1.4, 1.5, and 1.6 (see appendix 1) present the results for the five series of indices daily prices for the period from 1st January 2000 to 31st December 2008, considering the mean, median, and mode of the daily prices as cut points.

The "Test Value" in each output table corresponds to the statistic value used as the cut point. Referring to the Z statistics reported by the above tables, all the tests show that the null hypothesis of randomness can not be rejected. Hence, runs tests using all three measures of central tendency (median, mean, and mode) are consistent with previous results demonstrated in this chapter. On the other hand, these results contradict the findings of Karemera, Ojah, and Cole (1999); they reported that the hypothesis of independence can not be rejected at the 5% level for the Jordanian equity return series. However, the other tests used in their study, simple and multiple variance ratio tests, suggest that the Jordanian market is not weak-form efficient. In The study of Karemera, Ojah, and Cole (1999) consisted of 114 monthly observations of the returns covering the period from 1987:12 to 1997:5. The returns series is used to perform the runs test

2.5 Conclusion

Empirical literature suggests that the price behaviour in developed markets can be characterized as random walk. However, it is still controversial in the case of developing countries. The empirical results obtained in this chapter for the ASE suggests that it is not weak-form efficient. The ASE reflects a high degree of positive temporal dependency patterns, violating the assumption of random walk model.

However, this does not necessarily imply a violation of weak form efficiency. As Ko and Lee (1991) state that if the random walk hypothesis holds, the weak-form of the efficient market hypothesis must hold, but not vice versa. Thus, evidence supporting the random walk model is evidence of market efficiency. But violation of the random walk model need not be evidence of market inefficiency in the weak form.

References

Abraham, A., Seyyed, F. J., & Alsakran, S. A. (2002). Testing the random behavior and efficiency of the Gulf stock markets, *The Financial Review*, 37(3), 469-480. http://dx.doi.org/10.1111/0732-8516.00008

Beechey, M., Gruen, D., & Vickery, J. (2000). The Efficient Market Hypothesis: A Survey. Research Discussion Paper, Economic Research Department, Reserve Bank of Australia.

Branes, P. (1986). Thin Trading and Stock Market Efficiency: A Case of the Kuala Lumpur Stock Exchange. *Journal of Business Finance and Accounting*, 13, 609-617. http://dx.doi.org/10.1111/j.1468-5957.1986.tb00522.x

Butler, K. C., & Malaikah, S. J. (1992). Efficiency and Inefficiency In Thinly Traded Stock Markets: Kuwait and Saudi Arabia. *Journal of Banking and Finance*, 16, 197-210. http://dx.doi.org/10.1016/0378-4266(92)90085-E

Chakraborty, M. (2006). Market Efficiency for the Pakistan Stock Market. *South Asia Economic Journal*, 7(1), 67-81. http://dx.doi.org/10.1177/139156140500700104

Cooper, J., (1982). World Stock Market: Some Random Walk Test. *Applied Economics*, 14, 512-531. http://dx.doi.org/10.1080/00036848200000046

Dickinson, J., & Muragu, K. (1994). Market Efficiency in Developing Countries: A Case Study of the Nairobi Stock

Exchange. *Journal of Business Finance and Accounting*, 21, 133-149, http://dx.doi.org/10.1111/j.1468-5957.1994.tb00309.x

Dragotă, V., Stoian, A., Pele, D, T., Mitrică, E., & Bensafta, M. (2009). The Development of the Romanian Capital Market: Evidences on Information Efficiency. *Romanian Journal of Economic Forecasting*, 10, 147-160.

El-Erian, M., & Kumar, M. (1994). Emerging Equity Markets in Middle Eastern Countries. International Monetary Fund, Middle Eastern & Research Departments. *Working Paper,* WP/94/103.

Fama, E. (1965). The Behavior of Stock-Market Prices. *The Journal of Business*, 38, 34-105. http://dx.doi.org/10.1086/294743

Filis, G. (2006). Testing for Market Efficiency in Emerging Markets: Evidence from the Athens Stock Exchange. *Journal of Emerging Market Finance*, 5, 121-133. http://dx.doi.org/10.1177/097265270600500201

Harvey, C., & Siddique, A. (1999). Autoregressive Conditional Skewness. *Journal of Financial and Quantitative Analysis*, 34, 465-487. http://dx.doi.org/10.2307/2676230

Karemara, D., Ojah, K., & Cole, J. (1999). Random Walks and Market Efficiency Tests: Evidence from Emerging Equity Markets. *Review of Quantitative Finance and Accounting*, 13, 171-188. http://dx.doi.org/10.1023/A:1008399910942

Kendall, M., (1953). The Analysis of Economic Time-Series, Part 1, Prices. *The Journal of Royal Statistical Society*, 116, 11-25. http://dx.doi.org/10.2307/2980947

Ko K.-S., & Lee S.-B., (1991). A Comparative Analysis of the Daily Behavior of Stock Returns: Japan, The US & the Asian NICs. *Journal of Business Finance and Accounting*, 18, 219-34. http://dx.doi.org/10.1111/j.1468-5957.1991.tb00590.x

Levene, H. (1952). On the power function of tests of randomness based on runs up and down. *Annals of Mathematical Statistics*, 23, 34-56. http://dx.doi.org/10.1214/aoms/1177729484

Mobarek, A., & Keasey, K. (2000). Weak-form Market Efficiency of an Emerging Market: Evidence from Dhaka Stock Market of Bangladesh. *Working Paper,* Center for Development Studies, Bath University.

Moustafa, M. A. (2004). Testing the Weak-Form Efficiency of the United Arab Emirates Stock Market. *International Journal of Business*, 29(3), 310-325.

Nourredine, K. (1998). Behavior of Stock Prices in the Saudi Arabian Financial Market: Empirical Research Findings. *Journal of Financial Management and Analysis*, 11, 48-55.

Omet, G., Khasawneh, M., & Khasawneh, J. (2002). Efficiency Tests and Volatility Effects: Evidence from the Jordanian Stock Market. *Applied Economic Letters,* 9, 817-821. http://dx.doi.org/10.1080/13504850210161931

Pandey A. (2003). *Efficiency of Indian Stock Market.* Time Series Course.

Peiró, A. (1999). Skewness in Financial Returns. *Journal of Banking and Finance*, 23, 847-862. http://dx.doi.org/10.1016/S0378-4266(98)00119-8

Poshakwale, S., (1996). Evidence on the Weak -Form Efficiency and the Day of the Week Effect in the Indian Stock Market. *Finance India*, 10, 605-616.

Pradhan, B. B., Das, K. B., & Mishra, P. K. (2009). Empirical Evidence on Indian Stock Market Efficiency in Context of the Global Financial Crisis. *Global J. Finance Manage*, 1(2), 149-157.

Premaratne, G., & Bera, A. (2001). Modelling Asymmetry and Excess Kurtosis in Stock Return Data. *Working Paper*, Department of Economics, University of Illinois.

Sharma, J. L., & Robert, E. K. (1977). A Comparative analysis of stock price behavior on the Bombay, London and New York Stock Exchanges. *Journal of Financial and Quantitative Analysis*, 12(3), 391-413. http://dx.doi.org/10.2307/2330542

Sharma, G. D., & Mahendru, M. (2009). Efficiency Hypothesis of the Stock Markets: A Case of Indian Securities. *International Journal of Business and Management*, 4(3),136-144.

Siegel, S. (1956). *Non-parametric Statistics for Behavioral Sciences*. New York, McGraw- Hill

Tas, O., & Dursonoglu, S. (2005). Testing random walk hypothesis for Istanbul Stock Exchange. *International Trade and Finance Association Conference Papers*. [E-document] [Retrieved March 23, 2006] From: http://services.bepress.com/otfa/15th/art38

Urrutia, J. (1995). Tests of Random Walk and Market Efficiency. *Journal of Financial Research*, 18, 299-309.

Table 1. Descriptive Statistics of Daily Indices Return

	GENERAL	BANKS	INSURANCE	INDUSTRY	SERVICES
Mean	0.000154	0.000352	0.000148	-0.000139	0.000008
Median	-0.000309	-0.000254	0.000000	-0.000564	-0.000274
Maximum	0.047449	0.048855	0.039177	0.047816	0.044548
Minimum	-0.043102	-0.048470	-0.045597	-0.045998	-0.044349
Std. Dev.	0.006831	0.008228	0.005949	0.008348	0.008101
Skewness[a] *(S)*	0.422	0.676	0.408	0.334	0.324
***t-statistics*[b]**	8.344	13.371	8.075	6.612	6.417
Kurtosis[c] *(K)*	8.778	8.613	14.358	7.905	7.256
***t-statistics*[d]**	57.116	55.491	112.271	48.486	42.073
Jarque-Bera *(JB)*	3331.90	3258.12	12670.03	2394.63	1811.33
Probability	0.000000	0.000000	0.000000	0.000000	0.000000
Observations	2345	2345	2345	2345	2345

[a] For normal distribution the value of skewness is zero

[b] The *t*-values indicate that the values of the skewness coefficient are statistically different than zero at 1% level of significance. The *t-statistic* is calculated as S/(sqrt(6/2345)).

[c] For normal distribution the value of Kurtosis is three.

[d] The *t*-value indicates that the values of the Kurtosis coefficient are statistically different than three at 1% level of significance. The *t-statistic* is calculated as (K-3)/(squr(24/2345)).

Table 1. Distribution of Runs by Length for the Actual and Expected Runs of Each Sign

General Index											
	(+)ve Runs				(-)ve Runs				(0) Runs		
Length	**Proba.**	**Expected**	**Actual**	**Length**	**Proba.**	**Expected**	**Actual**	**Length**	**Proba.**	**Expected**	**Actual**
1	0.503	193.5	168	**1**	0.501	193.5	139	**1**	0.997	2.0	2
2	0.250	96.5	80	**2**	0.250	96.5	101	**2**	0.003	0.0	0
3	0.125	48.1	56	**3**	0.125	48.1	41	**3**	0.000	0.0	0
4	0.062	24.0	34	**4**	0.062	24.0	42	**4**	0.000	0.0	0
5	0.031	12.0	18	**5**	0.031	12.0	21	**5**	0.000	0.0	0
6	0.015	6.0	12	**6**	0.015	6.0	16	**6**	0.000	0.0	0
7	0.008	3.0	7	**7**	0.008	3.0	13	**7**	0.000	0.0	0
8	0.004	1.5	4	**8**	0.004	1.5	4	**8**	0.000	0.0	0
Other	0.002	0.7	7	**Other**	0.002	0.7	9	**Other**	0.000	0.0	0
Total	0.998	385.3	386	**Total**	0.998	385.3	386	**Total**	1.000	2.0	2
Bank Index											
	(+)ve Runs				(-)ve Runs				(0) Runs		
Length	**Proba.**	**Expected**	**Actual**	**Length**	**Proba.**	**Expected**	**Actual**	**Length**	**Proba.**	**Expected**	**Actual**
1	0.504	205.7	194	**1**	0.503	205.7	163	**1**	0.993	6.0	6
2	0.250	102.0	75	**2**	0.250	102.2	91	**2**	0.007	0.0	0
3	0.124	50.6	57	**3**	0.124	50.8	64	**3**	0.000	0.0	0
4	0.061	25.1	44	**4**	0.062	25.3	27	**4**	0.000	0.0	0
5	0.030	12.4	17	**5**	0.031	12.5	25	**5**	0.000	0.0	0
6	0.015	6.2	8	**6**	0.015	6.2	17	**6**	0.000	0.0	0
7	0.007	3.1	6	**7**	0.008	3.1	8	**7**	0.000	0.0	0
8	0.004	1.5	3	**8**	0.004	1.5	8	**8**	0.000	0.0	0
Other	0.002	0.8	4	**Other**	0.002	0.8	6	**Other**	0.000	0.0	0
Total	0.998	407.3	408	**Total**	0.998	408.2	409	**Total**	1.000	6.0	6
Industry Index											
	(+)ve Runs				(-)ve Runs				(0) Runs		
Length	**Proba.**	**Expected**	**Actual**	**Length**	**Proba.**	**Expected**	**Actual**	**Length**	**Proba.**	**Expected**	**Actual**
1	0.503	194.2	167	**1**	0.501	194.2	141	**1**	0.996	3.0	3
2	0.250	96.5	85	**2**	0.250	97.0	93	**2**	0.004	0.0	0
3	0.124	47.9	57	**3**	0.125	48.4	50	**3**	0.000	0.0	0
4	0.062	23.8	33	**4**	0.062	24.2	41	**4**	0.000	0.0	0
5	0.031	11.8	15	**5**	0.031	12.1	19	**5**	0.000	0.0	0
6	0.015	5.9	10	**6**	0.016	6.0	18	**6**	0.000	0.0	0
7	0.008	2.9	10	**7**	0.008	3.0	11	**7**	0.000	0.0	0
8	0.004	1.5	3	**8**	0.004	1.5	5	**8**	0.000	0.0	0
Other	0.002	0.7	6	**Other**	0.002	0.8	10	**Other**	0.000	0.0	0
Total	0.998	385.3	386	**Total**	0.998	387.3	388	**Total**	1.000	3.0	3
Insurance Index											
	(+)ve Runs				(-)ve Runs				(0) Runs		
Length	**Proba.**	**Expected**	**Actual**	**Length**	**Proba.**	**Expected**	**Actual**	**Length**	**Proba.**	**Expected**	**Actual**
1	0.638	253.3	243	**1**	0.607	261.7	232	**1**	0.755	203.0	161
2	0.231	91.7	85	**2**	0.239	102.8	96	**2**	0.185	49.8	66
3	0.084	33.2	34	**3**	0.094	40.4	62	**3**	0.045	12.2	18
4	0.030	12.0	10	**4**	0.037	15.9	20	**4**	0.011	3.0	12
5	0.011	4.3	12	**5**	0.014	6.2	11	**5**	0.003	0.7	5
6	0.004	1.6	8	**6**	0.006	2.4	4	**6**	0.001	0.2	4
7	0.001	0.6	1	**7**	0.002	1.0	2	**7**	0.000	0.0	3
8	0.001	0.2	2	**8**	0.001	0.4	0	**8**	0.000	0.0	0
Other	0.000	0.1	2	**Other**	0.000	0.1	4	**Other**	0.000	0.0	0
Total	1.000	397.0	397	**Total**	1.000	430.9	431	**Total**	1.000	269.0	269

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Service Index											
	(+)ve Runs				(-)ve Runs				(0) Runs		
Length	**Proba.**	**Expected**	**Actual**	**Length**	**Proba.**	**Expected**	**Actual**	**Length**	**Proba.**	**Expected**	**Actual**
1	0.510	215.2	216	**1**	0.504	215.2	167	**1**	0.986	11.8	12
2	0.250	105.5	85	**2**	0.250	106.7	121	**2**	0.014	0.2	0
3	0.122	51.7	50	**3**	0.124	52.9	50	**3**	0.000	0.0	0
4	0.060	25.3	27	**4**	0.061	26.3	28	**4**	0.000	0.0	0
5	0.029	12.4	14	**5**	0.030	13.0	27	**5**	0.000	0.0	0
6	0.014	6.1	16	**6**	0.015	6.5	13	**6**	0.000	0.0	0
7	0.007	3.0	6	**7**	0.007	3.2	9	**7**	0.000	0.0	0
8	0.003	1.5	2	**8**	0.004	1.6	6	**8**	0.000	0.0	0
Other	0.002	0.7	6	**Other**	0.002	0.8	6	**Other**	0.000	0.0	0
Total	0.998	421.3	422	**Total**	0.998	426.2	427	**Total**	1.000	12.0	12

Table 3. The Results for the Runs Up and Down Test

Index	Actual Runs	Expected Runs	Standard Error	Z-statistic
General	929	1171.9	24.10	(-10.09)**
Bank	990	1175.1	24.07	(-7.71)**
Industry	942	1168.3	24.00	(-9.45)**
Insurance	1294	1540.6	22.72	(-10.88)**
Service	1042	1192.2	23.95	(-6.29)**

** Significant at 1% level

Table 4. Runs Above and Below the Median Test

	General	Banks	Insurance	Industry	Services
Test Value	152.8	190.4	124.6	115.9	114.0
Cases < Test Value	1172	1172	1171	1172	1172
Cases >= Test Value	1173	1173	1174	1173	1173
Total Cases	2345	2345	2345	2345	2345
Number of Runs	55	12	22	39	35
Z	-46.2**	-47.9**	-47.5**	-46.8**	-47.0**

** Significant at 1% level

Table 5. Runs Above and Below the Mean Test

	General	Banks	Insurance	Industry	Services
Test Value	150.3	192.9	129.8	113.5	121.4
Cases < Test Value	1030	1223	1501	1056	1385
Cases >= Test Value	1315	1122	844	1289	960
Total Cases	2345	2345	2345	2345	2345
Number of Runs	39	20	14	23	17
Z	-46.8**	-47.6**	-47.8**	-47.5**	-47.7**

** Significant at 1% level

Table 6. Runs Above and Below the Mode (1) Test

	General	Banks	Insurance	Industry	Services
Test Value	160.7	216.7	122.8	117.0	100.2
Cases < Test Value	1597	1618	990	1257	172
Cases >= Test Value	748	727	1355	1088	2173
Total Cases	2345	2345	2345	2345	2345
Number of Runs	41	22	44	45	39
Z	-46.5**	-47.4**	-46.6**	-46.6**	-42.7**

** Significant at 1% level

(1)There are multiple modes. The mode with the largest data value is used.

Analysis of Industrial Transfer Mechanism Based on Environmental Regulation

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Abstract

Based on outcomes of existing researches, This paper discussed capital mobility in condition of monopolistic competition and transaction costs which be decided by cost of environmental regulation, also analyzed new economic geography model of industrial transfer. After derivation and analysis of model, we find that in short term, industrial transfer of different regions is related to transaction costs due to environmental regulations, which means lower transaction costs and higher trade freedom can promote industrial transfer; While in long term, equilibrium point of industrial transfer changes with change of different initial endowment of capital and labor of two regions.

Keywords: Environmental regulation, Capital gains, Iceberg transaction costs, Industrial transfer

1. Introduction

Industrial transfer refers to phenomena that enterprises transfer some or all of their productions from original regions to other regions which have different economic development levels, resulting in this status that spatial distribution of enterprises transfer from developed regions to developing ones. Although this concept itself can not show causes and more features of industrial transfer between different regions, it directly reflects this meaning of shift and distribution of economic activities, therefore it is inseparable of new economic geography research.

New economic geography researches on spatial distribution of economic activity, which refers to various countries or different regions within a country or city. Viewing existing literatures, many foreign scholars have studied importance of space factors in economic analysis, especially model of increasing returns under monopolistic competition proposed by Dixit and Stiglitz (1977), which made a new breakthrough on research of Spatial Economics. This model builds consumer preference function under assumptions that market structure is monopolistic competition, trying to answer basic questions of welfare economics from perspective of economies of scale, namely, whether market can produce socially optimal types and quantity of goods. On this basis, Paul Krugman (1991) constructed a model that contains only two regions. This model includes two types of products: agricultural product and manufactured goods. The former is produced by agricultural sector which is perfect competed, has constant returns to scale and produces only a single agricultural product; the latter is produced by industrial sector which is monopolistic competed, has increasing returns to scale and produces a wide variety of industrial products. After analyzing model, we found that economies between two regions will eventually form framework of industrialized area as core and agricultural area as periphery, then we proposed a "core-periphery" model. Based on this, researches on spatial distribution of economic activities from perspective of new economic geography are widely concerned , such as, Duranton and Overman (2005) improved research on regional economy with closely accurate enterprise geographic data under assumption that regional distribution of enterprises is continuous and not affected by regional marginal limit. Li and Long (2005)discussed relationship between capital element, technology transfer and business gathering by improving Dixit-Stiglitz monopolistic competition model, then discovered that different factors which affects business gathering is decided by different capital return, and technology transfer is one factor of business gathering. By means of theoretical perspective of new economic geography, Zhang etc.(2006)considered that upgrading industrial structure in a country should first enforce industrial transfer within country, then achieve inter-regional collaboration upgrading of industrial structure through layout of industrial structure in different regions. Gao(2007) made an analysis of spatial concentration and dynamics of economic activities by using method of mainstream economics, a found that factors such as opening and development gap between regions, contributed to occurrence of industrial transfer and formation of industrial clusters. Wu and Zeng(2007) constructed a circle economic structure formed by industrial transfer from

perspective of specialization, and considered that structure was conducive to upgrading of China's regional industrial structure. Xie ect.(2010)examined variation of China's 19 industries locational Gini coefficient before and after accession to WTO, by the way of using new economic geography theory of industrial clustering, and found that changes in China's regional economic differences had a trend of slowing down.

Above literatures analyzed clustering and upgrading of industrial structure from perspective of new economic geography, but lack of deep research on phenomenon of industrial transfer which is in connection with formation of industrial clusters, and can optimize industrial structure. On basis of existing researches, this paper studied mechanism of industrial transfer through improving Dixit-Stiglitz's model, and tried to analysis various factors which have impact on China's industrial transfer, its purpose is coordinate development of Chinese regional economic.

2. Establishment of Model

According to new economic geography theory, assuming that there are two regions, N and S, which have two industries A and B respectively, and two regions are symmetrical in preferences, technical conditions, openness to trade, factor endowments and other aspects; Suppose industry B is perfectly competitive, constant returns to scale, and its production uses only a factor : labor force L. Industry A is monopolistically competitive, with characteristics of increasing returns to scale and environmental regulation, and so on. In addition to labor factor L, industrial production also demands another factor of production, namely capital K, and industrial production that produces a product needs one unit of capital as fixed cost. Both N and S produce and consume products of industries A and B, N has industry A with number of n, and S with n*.

Returns on capital are π and π^* respectively in both regions; we also assume that capital can flow over regions, in order to pursue highest rate of return; taking impact of capital movements into account, we assume that labor and capital owners are not mobile, and capital income is consumed by owners in its location. Consumers from both regions have the same utility function. At the same time, we assume that it has no transaction costs for products from industry B, no transaction costs for products from industry A while in local transaction, but there exist "iceberg transaction costs (G)" in foreign transactions, which is determined by "melting coefficient (τ)" and "distance (d)".Here "distance" is a broad concept, on behalf of impact of environmental regulation in this paper. Expression as follows:

$$G=\tau d$$

3. Derivation of Model

Following derivation takes region N ,as an example, S in similar situation, marked by asterisk(*).

Utility function is divided into two levels: first level refers to Cobb-Douglas utility function that consumers consume both products from industries A and B; second level is utility function that consumers consume products portfolio from industry A, expressed by CES function. That is:

$$U = U(C_A, C_B) = C_A^{\mu} C_B^{1-\mu} \tag{1}$$

$$C_A = [\sum_{i=1}^{n} c_{NN}^{(\sigma-1)/\sigma} + \sum_{j=1}^{n^*} c_{NS}^{(\sigma-1)/\sigma}]^{\sigma/(\sigma-1)} \qquad 0<\mu<1, \rho = \frac{\sigma-1}{\sigma} < 1, \sigma>1 \tag{2}$$

Where U denotes consumer's utility, and C_A is a quantitative indicator of consumers consume products from industry A ,$C_A=(c_1,c_2,c_3,\ldots,c_n)$. $n^{\omega}=n+n^*$ is number of total demand for products from industry A in region N, c_{NN} and c_{NS} are numbers of region N's consumer's demand for products from industry A which are produced in region N and S respectively, σ is elasticity of substitution between products of industry A, μ is share of expenditure on products from industry A in total expenditure, both σ and μ are constants.

In first stage, consumer's total budget can be broken down into budget for products form industry A and budget for products from industry B. The issue is how consumer choose C_A and C_B to maximize utility:

$$U = U(C_A, C_B) = C_A^{\mu} C_B^{1-\mu}$$

$$P_N C_A + P_S C_B = I \tag{3}$$

P_N,P_S denote price index of products portfolios from N and S,I is consumer's income level. Based on first-order conditions for total utility maximization under constraints of total expenditure, direct demand function about CA and CB is:

$$C_A = \mu I / P_N, C_B = (1-\mu) I / P_S \tag{4}$$

In second stage, it minimizes consumer's expenditure considering that consumer s consume products portfolio from industry A, that is, it maximizes consumer's subutility under constraint of $\sum_{i=1}^{n} p_{NN} c_{NN} + \sum_{j=1}^{n^*} p_{NS} c_{NS} = \mu I$ .Lagrange equation is :

$$L = [\sum_{i=1}^{n} c_{NN}^{(\sigma-1)/\sigma} + \sum_{j=1}^{n^*} c_{NS}^{(\sigma-1)/\sigma}]^{\sigma/(\sigma-1)} + \lambda[\sum_{i=1}^{n} p_{NN} c_{NN} + \sum_{j=1}^{n^*} p_{NS} c_{NS} - \mu I] \tag{5}$$

Then we can get demand of N's consumers for products, which produced in region N, from industry A .

$$c_{NN} = \mu I \frac{p_{NN}^{-\sigma}}{P_N^{1-\sigma}}, I = \pi K + W_L L$$

P_{NN}, P_{NS} denote sale prices of products from industry A in region N and S respectively, which are produced in region N.P_{SS},P_{SN} are sale prices of products from industry A in region S and N respectively, which are produced in region S.I is not only total income, but also total expenditure(In case of monopolistic competition, industry's excess profits is zero when it is at equilibrium point, so I only contains factor income). $P_N^{1-\sigma}$ is price index of products from industry A in region N. Similarly, we can get c_{NS}, c_{SS} (demand of consumer S for products ,which produced in region S, from industry A), c_{SN} (demand of consumers S for products, which produced in region N, from industry A) respectively:

$$c_{NS} = \mu I \frac{p_{NS}^{-\sigma}}{P_N^{1-\sigma}}, c_{SS} = \mu I^* \frac{p_{SS}^{-\sigma}}{P_S^{1-\sigma}}, c_{SN} = \mu I^* \frac{p_{SN}^{-\sigma}}{P_S^{1-\sigma}} \tag{6}$$

If we ignore impact of price changes of some products on overall price index in formula of consumer demand, then $P_N^{1-\sigma}$ and μ are constants. We may assume that:

$$k = \mu I / P_N^{1-\sigma}, k^* = \mu I^* / P_S^{1-\sigma}$$

Then formula (6) can also be simplified as：

$$c_{NN} = k p_{NN}^{-\sigma}, c_{NS} = k^* P_{NS}^{-\sigma}, c_{SS} = k p_{SS}^{-\sigma}, c_{SN} = k^* p_{SN}^{-\sigma} \tag{7}$$

Above formulas give a description of constraint conditions, under which industry A makes price and output decision between two different regions in order to maximize profits. Consumer in regions N and S have the same utility function of products from industry B. Because we assume no transaction costs for products from industry A while in local transactions, but there exist "iceberg transaction costs (G)" in foreign transactions, then optimal outputs of industry A in regions N and S are :

$$x_N = c_{NN} + d\tau c_{SN} = k p_{NN}^{-\sigma} + d\tau k^* (p_{SN})^{-\sigma} = k p_{NN}^{-\sigma} + d\tau k^* (d\tau p_{NN})^{-\sigma} = [k + (d\tau)^{1-\sigma} k^*] p_{NN}^{-\sigma}$$

$$x_S = c_{SS} + d\tau c_{NS} = k p_{SS}^{-\sigma} + d\tau k^* (p_{NS})^{-\sigma} = k p_{SS}^{-\sigma} + d\tau k^* (\tau p_{SS})^{-\sigma} = [k + (d\tau)^{1-\sigma} k^*] p_{SS}^{-\sigma} \tag{8}$$

In front we assumed that fixed cost of every industry A in regions N and S is one unit of capital, while variable cost of per unit of output requires one unit of labor, which is free to enter and exit. Therefore, excess profit of industry is zero when it is at equilibrium status. Profit-maximizing pricing principle of industry is marginal cost-plus pricing. Because of "iceberg transaction costs" in inter-regional trade, ratio of local products in overseas trading price and local trading price is $d\tau$ .we can draw out profit function of industry A in region N：

$$p_{NN} x_N - (\pi + W_L a_m x_N)$$

π denotes return of one unit of capital, $W_L$is gains for one unit of labor. Therefore, we can work out prices of product when traded in local and foreign market under constraints of formula (8) by establishing Lagrangian Function of industry profits：

$$L = p_{NN} x_N - (\pi + W_L a_m x_N) + \lambda[x_N - k p_{NN}^{-\sigma} + d\tau k^* p_{NS}^{-\sigma}]$$

According to $p_{NS} = d\tau p_{NN}$,we can get：

$$L = p_{NN} x_N - (\pi + W_L a_m x_N) + \lambda[x_N - (k + d^{1-\sigma}\tau^{1-\sigma} k^*) p_{NN}^{-\sigma}] \tag{9}$$

we can solve：

$$p_{NN} = \frac{W_L a_m}{(1 - 1/\sigma)}, p_{NS} = \frac{d\tau W_L a_m}{(1 - 1/\sigma)} \tag{10}$$

Suppose industry A makes choice of its location according to its own capital gains from regions N or S. In case of monopolistic competition, excess profit of industries is zero, so sales revenue is equivalent to cost of production：

$$p_{NN}c_{NN} + p_{NS}c_{NS} = \pi + W_L a_m (c_{NN} + c_{NS})$$

Combined with formula (10), industry A's gains from region N can be expressed as：

$$\pi = p_{NN} x_N / \sigma = \mu p_{NN}^{1-\sigma} [I P_A^{-(1-\sigma)} + I^* d^{1-\sigma} \tau^{1-\sigma} P_B^{-(1-\sigma)}] \quad (11)$$

$P_N^{1-\sigma}, P_S^{1-\sigma}$ denote price indices of industries A and B in region N.

$$P_N^{1-\sigma} = \sum_{i=1}^{n} p_{NN}^{1-\sigma} + \sum_{j=1}^{n^*} p_{NS}^{1-\sigma} = n p_{NN}^{1-\sigma} + n^* (d\tau p_{NN})^{1-\sigma} = n^{\omega} p_{NN}^{1-\sigma} [s_n + \Phi(1-s_n)] \quad (12)$$

$$P_S^{1-\sigma} = \sum_{i=1}^{n} p_{SN}^{1-\sigma} + \sum_{j=1}^{n^*} p_{SS}^{1-\sigma} = n (d\tau p_{SS})^{1-\sigma} + n^* (p_{SS})^{1-\sigma} = n^{\omega} p_{SS}^{1-\sigma} [s_n + \Phi(1-s_n)] \quad (13)$$

Taking formulas (12) and (13) into (11),we have：

$$\pi = p_{NN} x_N / \sigma = \frac{\mu p_{NN}^{1-\sigma}}{\sigma} [\frac{I^{\omega} s_I}{n^{\omega} p_{NN}^{1-\sigma} (s_n + \Phi(1-s_n))} + \frac{I^{\omega}(1-s_I)\Phi}{n^{\omega} p_{NN}^{1-\sigma} (\Phi s_n + (1-s_n))}]$$

$$= \frac{\mu I^{\omega}}{\sigma n^{\omega}} [\frac{s_I}{(s_n + \Phi(1-s_n))} + \Phi \frac{(1-s_I)}{(\Phi s_n + (1-s_n))}] \quad (14)$$

$\Phi = (d\tau)^{1-\sigma}$, $s_n = n/n^{\omega}$ denotes share of industry A in region N, $1-s_n = n^*/n^{\omega}$ is share of industry A in region S, $s_I = I / I^{\omega}$ is ratio of expenditure in region N in total expenditure, $1-s_I = I^*/I$ is ratio of expenditure in region S in total expenditure. Similarly, we can get capital gains of industry A when it chooses location in region S：

$$\pi^* = \frac{\mu I^{\omega}}{\sigma n^{\omega}} [\Phi \frac{s_I}{s_n + \Phi(1-s_n)} + \frac{1-s_I}{\Phi s_n + (1-s_n)}] \quad (15)$$

then, difference of capital gains between two region is：

$$\pi - \pi^* = b \frac{I^{\omega}(1-\Phi)}{K^{\omega} \Delta \Delta^*} [(1+\Phi)(s_I - \frac{1}{2}) - (1-\Phi)(s_n - \frac{1}{2})] \quad (16)$$

$$b = \mu / \sigma, \Delta = s_n + \Phi(1-s_n), \Delta^* = \Phi s_n + (1-s_n)$$

4. Conclusion

4.1 Short-Term Equilibrium

From formula (16), we can see that if there are no "iceberg transaction costs" between regions N and S, which means capital returns of industry in regions N and S is equal when trade is freedom. $\Phi = (d\tau)^{1-\sigma} = 1$.Usually, $0 < \Phi = (d\tau)^{1-\sigma} < 1$. Then difference of capital gains of two regions is related to "iceberg transaction cost" ($d\tau$), industrial distribution of two regions (n, n^*), and consumer expenditures(I, I^{ω}).industry will make choice of its location according to capital gains of two regions.

Under different "iceberg transaction costs", effect intensity of each factor will be different. First, when "iceberg transaction costs" is low level , which means two environmental regulation strength (d) is weak or melt coefficient (τ) is small, freedom of trade tends to be 1.

$$\lim_{\Phi \to 1} (\pi - \pi^*) = b \frac{I^{\omega}(1-\Phi)}{K^{\omega} \Delta \Delta^*} [(1+\Phi)(s_I - \frac{1}{2}) - (1-\Phi)(s_n - \frac{1}{2})] = 0$$

At this point, industries have similar returns on capital in regions N and S. Choice of industry's location is less affected by share of expenditure in income and industrial distribution of two regions. With strength of environmental regulation increases, it will have an impact on choice of industry's location in two regions which have initial endowment with symmetrical distribution, leading industry moves to area with greater capital gains.

Secondly, when "iceberg transaction cost" is at a high level, that environmental regulation strength(d) of two regions is strong or melt coefficient (τ) is large, then freedom of trade tends to be zero.

$$\lim_{\Phi \to 0} (\pi - \pi^*) = b \frac{I^{\omega}(1-\Phi)}{K^{\omega} \Delta \Delta^*} [(1+\Phi)(s_I - \frac{1}{2}) - (1-\Phi)(s_n - \frac{1}{2})] = b \frac{I^{\omega}(s_I - s_n)}{K^{\omega} s_n (1-s_n)}$$

From above formula we can conclude that shift direction of industries between two regions depends on two opposite

forces. It has an positive impact on difference between profitability of capital gains if share of expenditure in income is greater than share with symmetrical distribution, which means region with larger share of expenditure has greater attractiveness of capital, resulting in industrial transfer to region with larger share of expenditure. If actual use of capital share exceeds that of symmetric distribution, it will reduce capital return in region N, and impede capital flowing to region N. Ultimate flowing direction of capital depends on sizes of two forces. We assume that each industry only uses one unit of capital and labor to product, so amount of capital equals to numbers of industries, which implies transfer of capital means industrial transfer.

4.2 Long-Term Equilibrium

In the long run, we can use equation of capital flow to represent long-run equilibrium of industry locating.

$$\frac{ds_n}{dt} = (\pi - \pi^*) s_n (1 - s_n) \tag{15}$$

From this, we can conclude that there are two possible long-run equilibriums. One is equilibrium of the same return on capital in two regions, that is $\pi = \pi^*$, Another is equilibrium of that all industry A will choose the same location to product at the same time, then $s_n = 0$ or $s_n = 1$ .We can also solve:

$$s_n = \frac{1}{2} + \frac{1 + \Phi}{1 - \Phi}(s_E - \frac{1}{2}) \tag{16}$$

Then we can draw out long-term equilibrium solution figure of industry A.

Insert Figure 1 here

In figure 1, this expression of curve II is:

$$s_I = \frac{E}{E^\omega} = (1-b)s_L + bs_k, s_L \equiv \frac{L}{L^\omega}, s_K \equiv \frac{K}{K^\omega}$$

Which is formed by equilibrium point. Curve nn is represented by formula (16) ,which is standard of capital mobility. Stable long-run equilibrium is determined by curve II and curve nn. Slope of curve nn($(1+\Phi)/(1-\Phi)$) varies with trade freedom .The greater trade freedom Φ (the smaller "iceberg transaction cost"),the greater $(1+\Phi)/(1-\Phi)$,the steeper curve nn. But no matter how trade freedom changes, curve nn is always through equilibrium point(1/2,1/2). Slope of curve nn is greater than 1, or coefficient of independent variable S_I ,which represents market share, is always greater than 1, that is, changes in local market share will result in a greater proportion of local industrial changes. Intersection of curve II and curve nn is long-run equilibrium point of industry in two regions. Point A(1/2,1/2) is its long-run equilibrium point when regions N and S have symmetrical distribution of labor endowment and capital endowment. If distribution of initial endowment is non-symmetrical, intersection of curve $I'I'$ and curve nn (point B) is its long-run equilibrium point.

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References

An, H. (2005). The Principle of Spatial Economics. Beijing China, *Economic Science Press*.

Davis, D. R., & Weinstein, D. E. (2002). Bones, Bombs and Break Points: The Geog- raphy of Economic Activity. *American Economi*c *Review*, l92, 1269-1289. http://dx.doi.org/10.1257/000282802762024502

Dixit, A. K., & Stiglitz, J. E. (1977). Monopolistic Competition and Optimu Product Diversity. *American Economic Review*, 6, 297-308.

Duranton, G., & Overman, H. G. (2005). Testing for Localisation Using Micro-Geographic Data. *Review of Economic Studies*, 72, 1077-1106. http://dx.doi.org/10.1111/0034-6527.00362

Gao, Y. (2007). Study of Industrial Clusters in the Context of Multi-angle of Economic Geography. *The Journal of Lanzhou Commercial College*, 2, 12-15.

Krugman, P. (1991). Increasing returns and economic geography. *Journal of Political Economy*, 99, 183-199.

http://dx.doi.org/10.1086/261763

Li, Y. Z., & Long, Z. H. (2005). Business Gathering Model Based on the Movement of Capital. *Quantitative and Technical Economics Research*, 3, 8-15.

Wu, X. B., & Zeng, Z. (2007). The Structure of Circle, Economic and Coordinated Development of Regional Economy in China. *Industry Economic Research*, 2, 47-56.

Xie, Y., & Zhong, S. Y. (2010). Bussiness Gathering and the Differences in Regional Economic Development in China-based on the Perspective of New Economic Geography. *Industrial Technology and Economy*, 5, 133-138.

Zhang, Y. B., Huang, J. L., & Zeng, Z. (2006). Cities,"Circle" of Economic and Industrial Upgrading-based on the Analysis of Theoretical Perspective of Economic Geography. *China's Industrial Economy*, 12, 45-52.

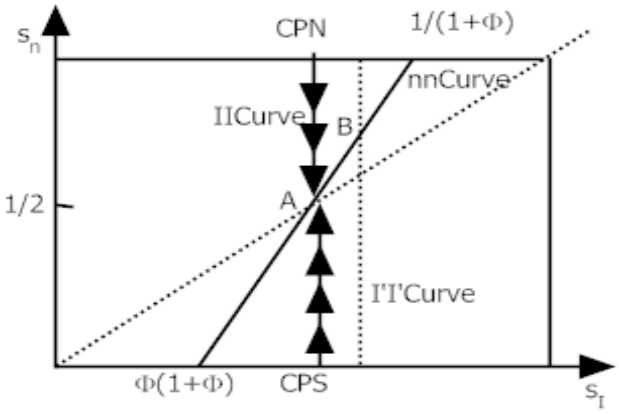

Figure 1. Long-Term Equilibrium Solution of Industry A

Gaining Competitive Advantage through Marketing Strategies in Container Terminal: A Case Study on Shahid Rajaee Port in Iran

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Abstract

Shahid Rajaee port complex at Bandar Abbas is the country's principal gateway for containerized cargo. It has emerged as a leading regional commercial center and a world class business environment. It has now become the logical place to do business in the Middle East, providing investors with a unique value added platform. Ports have a significant role in today's networked business environment. They are being regarded as hubs that are part of various logistics systems. The very essence of seaport is to link maritime networks and land network. These networks for the port are means of analyzing its competitiveness. The objective of this study is to find out the main factors which impact on competitiveness of container port in Shaied Rajaee. Port and enable it to suggest and apply the profound marketing strategy to get the huge load in this port. Based on our findings by employing the factor analysis is to reveal the vital competitiveness of the port. It reveal that that port strategy and policy, port logistics, hinterland condition, availability, shipping maritime service, port Regional center, shipping agreement and port service and connectivity are determining factors in the shahid Rajee port in Iran.

Keywords: Port competitiveness, Shipping line, Marketing strategy, Shaid Rajee, Factor analysis, Iran

1. Introduction

Port investment is continuous in most parts of the world, to cope with the year-on-year growth in container trade. The Middle East has seen strong container port demand growth, and virtually all ports have programmes to increase capacity and/or their capability to handle larger vessels.

1.1 Shahid Rajaee Port

The market environment in which seaports operate is changing. Ports are confronted with changing economic and logistics systems. Port authorities and port management effectively to market dynamics whose objectives are

significantly economic, are forced to re-assess their role and related governance structures.

The coastline of the Islamic Republic of Iran borders the Persian Gulf, the Gulf of Oman, and the Caspian Sea. All three sea areas have important ports, Iran's largest port, Bandar Abbas, is located on the Strait of Hormuz, the narrow passage separating the Persian Gulf and the Gulf of Oman. These sea areas are of high significance for the commercial navigation: the Gulf Areas due to the large hydrocarbon reserves with increasing vessel traffic, especially tanker traffic and the Caspian Sea due to the potential growth of transport through the "North-South corridor". Iran's Commercial Ports General Master Plan – Phase II covers the following eight major, and four minor ports.

Shahid Rajaee port complex at Bandar Abbas has 1,050 m of container quay, equipped with two panamax and eight post-panamax container gantry cranes, the most recent five of which were installed in 2004-05. In 2004, the handling of feederships was transferred to general cargo quays, served by mobile cranes. The container terminal is operated by Tidewater Middle East, of which the government's Ports and Shipping Organization owns 45.76 per cent. Under the country's fourth five-year plan, the government's shares are to be sold to the private sector by 2010. A second container terminal, of 70h, is due to open in 2008, with 850m of quay, 17m depth alongside and eight super post-panamax container gantry cranes. A second phase is intended to add 140h and 2,050m of quay.

1.2 Capacity Forecasts of Middle East

Based on quantification of port and terminal investment plans, capacity forecasts for the Middle East are detailed by port range and port in below Table. Container handling capacity at Middle East ports is set to increase by 148 per cent over 2006-15 to 69.6m TEU/year.

According to the anticipated course of port investment, capacity at ports on the Persian Gulf and Gulf of Oman will grow by 147 per cent over 2006-15 to 48.1m TEU/year. New terminal development at Jebel Ali is expected to boost capacity at the Dubai ports by 141 per cent to 26.5m TEU/year over this period. Abu Dhabi and Bahrain are both set to increase capacity by a factor of four with the planned development of new ports at Taweelah and Mina Khalifa respectively, whilst Kuwait's planned new Bubiyan terminal is expected to contribute to a 3.9-fold growth in capacity.

On the Arabian Sea and Gulf of Aden range, a 184 per cent increase to 9.9m TEU/year will be generated by anticipated investment programmes over 2006-15. Salalah will remain the dominant port in the range with a 173 per cent rise in capacity to 6.6m TEU/year, but the largest increase will come from Djibouti's planned new 1.6 TEU/year capacity terminals at Doraleh.

Ports on the Red Sea will see a 128 per cent increase in capacity over 2006-15, to 11.58m TEU/year, if investment proceeds as anticipated. Saudi ports – in particular Jeddah – will remain pre-eminent, with 119 per cent growth to 7.7m TEU/year, but strong increases are also planned in Jordan, Egypt and Sudan.

2. Literature Review

2.1 Port and Shipping

There is an expanding interest in the changing role of ports as a result of the globalization of production and distribution (K. Bichou, 2004; Carbone, 2003; De Martino, 2003; Gray, 2004; Notteboom, 2005; Robinson, 2002; Rodrigue, 2005). Customarily, ports are taken into account to act as an interface between ships and shore by preparing shelter and berthing space, temporary storage and the supply of superstructure and infrastructure for cargo operation and movement within port. So, their functions and roles are seen as a standalone with very little attention to the importance of the other parts of the supply chain. On this basis, the main part of research in the area has been on the efficiency and performance of seaports and container terminals (Cullinane, 2002; Heng, 2005; Tongzon, 2005). Currently, ports are considered to have a new role to fulfill in the era of globalization. The development of global supply chains changes ports' role towards efficient distribution of products across supply chains as opposed to performance in loading, unloading of ships and berth availability. In this new role, the port is considered as part of a cluster of organizations in which different logistics and transport operators are involved in bringing value to the final consumers. In order to be successful, these channels require gaining a higher degree of coordination and cooperation (De Souza, 2003; Panayides, 2007; Song, 2007). There are substantial gains to be made from technology investment with the insurance that the productivity gains from technology investments are manifested in cost savings to port users. In addition, there are also consequential gains from implementing programs on customer and stakeholder relationships and from introducing value-added services. For example, an investment in a more advanced information technology to reduce turnaround times for ships can provide gains for shipping lines which can be passed onto shippers in terms of lower freight rates. More must be done to implement programs for port integration in the supply chain while maintaining more flexibility and responsiveness to the preferences of shipping

lines. In spite of their pioneering work of measuring the relationship, their findings do not provide balanced views between the service providers and the actual service users. The concept of supply chain is complex and consists of a number of parties involved in the delivery and in adding value to the final product. A gap in perceptions is potentially important as it indicates either the possibility of over-emphasis on areas that customers do not value, or a potential shortfall in provision of services in areas they do. There some important factors which effect on port importance such as having Confidence in port schedules, frequency of calling vessels, variety of shipping routes, accessibility of port (Pearson, 1980), navigation distance, hinterland nearness, connectivity to ports, port facilities, availability of port, port tariffs(Willingale, 1981), average waiting time in port, port service capacity(Collison, 1984), calling frequency, tariffs, accessibility in port schedules, port congestion, inter-linked transportation networks(Slack, 1985), port costs, frequency of calling vessels, port reputation and/or loyalty, ship direct calling, experience of cargo damage(Brooks, 1984, 1985). Having loading and unloading facilities for large and/or odd-sized freight, having low freight handling shipments, providing a low frequency of loss and damage, equipment availability, offering convenient pick-up and delivery times, providing information concerning handling, offering assistance in claims handling, offering flexibility in meeting special handling requirements(P. Murphy, Dalenberg, D., Daley, J.,, 1988, 1989, 1991; P. Murphy, Daley, J., Dalenberg, D.,, 1992).Other approaches which have been proposed have divided effective factors in port industry and shipping lines by two groups: Internal and External. Internal factors like service level, availability facility capacity, status of the facility, port operation policy. External factors like international politics, change of social environment, trade market, economic factors, features of competitive ports, functional changes of transportation and materials handling(Peters, 1990), geographical location, hinterland networks, availability and efficiency of transportation, port tariffs, stability of port, port information system(UNCTAD, 1992), port facilities, inland transportation networks, container transport routes(McCalla, 1994), geographic location of ports, inland railway transportation, investment of port facilities, stability of port labor(Starr, 1994), port tariffs, safety handling of cargoes, confidence in port schedules (Tengku, 1995), custom service, rapidness, simple documents in port, cargo damage and skills of port (Chiu, 1996).

2.2 Port Competitiveness

The verification of port competitiveness has fundamentally focused on port selection criteria. In the 1980s,(Collison, 1984; Pearson, 1980; Slack, 1985; Willingale, 1981) purposed various components of port selection which covered Europe, America and South-east Asia. Moreover in the 1990s,(Brooks, 1985; McCalla, 1994; P. Murphy, Dalenberg, D., Daley, J.,, 1988, 1989, 1991; P. Murphy, Daley, J., Dalenberg, D.,, 1992; Peters, 1990; UNCTAD, 1992) exposed varying analytical dimensions and major factors influencing them. Studies in the 1990s included American studies of the geographic location of ports, inland railway transportation, investment in port facilities and the stability of port labor(Starr, 1994).

In 1995, Tengku's PhD thesis at Cardiff University entitled 'Marketing of freight liner shipping services with reference to the far-East-Europe trade: a Malaysian perspective' highlighted port tariffs, safe handling of cargoes, confidence in port schedules and port service. A year later at the same institution Chiu's PhD thesis 'Logistics performance of liner shipping in Taiwan' noted that customs service, rapidity of processing, simplicity of documentation in port, cargo damage and skills of port labor influenced port competitiveness (Table 4). Later,(Malchow, 2001) analyzed the flow of four commodities in eight major US ports. Moreover, they extended their studies in 10 major US ports by incorporating additional attributes finding that the most significant characteristic of a port was its location(Malchow, 2001). Recently,(Heng, 2005; Tongzon, 2005) suggested eight determining factors of port competitiveness and(K. Bichou, Gray, R., 2005) argued that port competition will shift from the institutional, functional and/or spatial levels to channel management.

3. Research Methodology

3.1 Identifying Factors Effect on the Competitiveness of the Port and Shipping Lines

As what mentioned, in this research we face with complexity of components. We have extracted components from different models and articles and join them to setup the base of our research. At the end, we start the analysis with 50 components. (Table 2)

3.2 Data Collection

We have conducted face-to-face interviews with participants of this research in April and May 2011, at first with 85 useable responses from 94 questionnaires were distributed in Shahid Rajaee different sections to coordinate the pilot test of our research. And then our research main tests were conducted with 320 useable responses from 343 questionnaires. Respondents' gender, age, Educational Level, job profiles have been illustrated in Table 1 to Table 4 in May 2011. Attitudes on each of the variables has been evaluated using five-point Likert scales attached firmly by the agreement level of each question with point of 1 = very poor and 5 = excellent.

3.3 Data Analysis

3.3.1 Reliability of Pilot Test, Calculation of Sample Size (N)

A reliability test, based on Cronbach's Alpha, is used to test the internal consistency of questionnaire responses. We have used Cronbach's Alpha (α) to show the reliability of pilot test. The Cronbach's Alpha of

pilot test is 0.934. It shows that the reliability of this test is high.

3.3.2 Reliability of Main Test

As we mentioned above, the research is conducted with considering the population upper than 294. The Cronbach's α of main test of our research is 0.843. Since the Cronbach's α is more than 0.7, it indicates our research reliable and the research questionnaire responses have high internal consistency (Cronbach, 1951; Nova´k, 2004; Ware, 1998)

3.3.3 Factor Analysis Results

Factor analysis has been employed as an appropriate methodology to synchronously validate measurements in port and transport studies (Blanc, 1998; Ha, 2003; Kent, 2001; Lu, 1999; Tracey, 2004). Fundamentally, it is divided by two approaches. The first approach of factor analysis, exploratory factor analysis, is used to explore and survey purposes to establish trends and variable structures and the second, confirmatory factor analysis, is used for evaluation and analysis. This study adopted the second approach, first of all, to explore and categorize the variables and then form clusters of components and the evaluation structure.

In the first step of this research, KMO and Bartlett's Test is used to know whether it is possible to employ factor analysis to reduce attributes of the research. The Kaiser-Meyer-Olkin measure of sampling adequacy figure is 0.732 higher than 0.6 and near to 1. It shows either the number of respondents is adequate. The quantity of Bartlett's sig. is 0.000 less than 0.05. It indicates factor analysis is appropriate for to identify the model of factors. Totally, these two outputs demonstrate we have permission to run factor analysis. In the next outcome, with principle component analysis, we find that the quantity of port safety and security attribute in extraction method is 0.454 less than 0.5. It shows this attribute should be eliminated for factor reduction. The factor analysis is run for the second time and the outcome shows the port privatization should be omitted that's why it is 0.488 less than 0.5. The factor analysis is run for the third time and all the attributes quantity is higher than 0.5. So we should terminate factor reduction and go to next outcome. The third outcome is total variance explained. In this outcome, the Initial Eigenvalues part determines that 16 factors will remain and the rest are omitted from the analysis. The Rotation Sums of Squared Loadings part in our research indicates 16 extracted factors with varimax rotation have Initial Eigenvalues higher than 1.0 and can remain in the analysis. These 16 factors interpret 67 % of variables variance. We used varimax rotation to normalize the percentage of variance among factors. For example, the percentage of variance for first factor without rotation is 14.880 while it is normalized to 6.235 with varimax rotation.

The other outcome which is the main part of our analysis is the Rotated Component Matrix which contains factor loadings of each variable in remained factors after rotation. In accordance with what we mentioned in previous paragraph, our research has 16 factors and 48 variables. It means we should have had 16 factors with 3 attributes for each one, but we didn't do it. For improvement, we combine each of 2 components to build 1 factor with 6 subsets. Thus, our research has 8 factors.

Insert Table 3 Here

In Rotated Component Matrix, we try to categorize each factor with 3 loadings with higher absolute value. The higher value of factor loading has the more effect on total variance. With consideration to the factor analysis on 50 variables, 8 factors are identified as main factors of our research. These eight factors are: 1. Port Strategy and Policy; 2. Port Logistics; 3. Hinterland Condition; 4. Availability; 5. Shipping Maritime Service; 6. Port Regional Service; 7. Shipping Agreement; 8. Port Service and Connectivity.

Insert Table 4 Here

- The factor analysis shows that the variables Reliability of Schedules in Port, Port Productivity, Recognition and Reputation of Port, Port Strategic Planning, Port Marketing Strategy, and Flexibility of Rules & Regulation are categorized under the factor of Port Strategy and Policy.

- The variables Efficient Inland Transport Network, Inland Transportation Cost, Port Software Capacity, Sophistication Level of Shipping Information Software and System, Port Infrastructure and Superstructure, Port Community are grouped under the factor of Port Logistics.

- The variables Hub & Spokes Network, Deviation from Main Trunk Route, Port Congestion, Reliability of Schedules in Shipping, Ship Safety and Security, Frequency of Large Container Ship Calling are grouped under the

factor of Hinterland Condition.

- The variables Service Differentiation, Availability of Vessel Berth on Arrival in Port, Well Articulated Logistics Flow and Added-Value Operation, Port Accessibility (Navigation Distance), Ship Capacity and Size, and Port Competition are the clusters of the factor of Availability.
- The other group of variables are Frequency of Ships Calling and Diversify of Ship Route, Frequency of Cargo Loss and Damage, Number of Direct Shipping Lines of Ocean-Going Vessel, Water Depth in Approach Channel and at Berth, Port Capacity and Size, and Port Cluster which form the factor of Shipping Maritime Service. (Table 3)
- The variables Port Location (Geographically), Special Economic Zone (SEZ) Free Economic Zone (FEZ), Cost for Cargo Handling, Transfer and Storage, Inter-Modal Link, Cost Related Vessel Entering are the clusters of the factor of Port Regional Center. (Table 3)
- Trade and Commerce Policy, Mutual Agreement of Port Users, Adaptability to the Changing Market Environment, Level of Service for Fresh Water, Bunkering, Ship products and Repair, Free Dwell Time on the Terminal, and Maritime Dependence Factors (MDF) are the loadings of the factor of Shipping Agreement. (Table 3)
- The variables Customs Clearance System, 24 Hour a Day, Seven Days a Week Service, Zero Waiting Time Service, Level of Ship Entrance and Departure, Hinterland Access, and Professionals and Skilled Labors in Shipping Operation are categorized under the factor of Port Service and Connectivity. (Table 3)

3.3.4 Reliability for Factors

A reliability test, based on Cronbach's Alpha, is used to test the each internal consistency of each construct (factor) and the result shows all of 8 factors have internal consistency. Port Strategy and Policy, Port Logistics, and Availability have the α values higher than 0.7 so their consistency is high, but the Cronbach's Alpha of Port Regional Service, Shipping Agreement, Port Service and Connectivity, Hinterland Condition, and Shipping Maritime Service are between 0.5 and 0.7 which shows normal consistency..(Cronbach, 1951; Nova´k, 2004; Ware, 1998).

4. Findings

As we mentioned in analysis section, now it is time to design main structured model of our research.

Insert Figure 2 Here

4.1 Correlation of Factors

We continue our research with analyzing the correlation of factors to measure the association among them. Satisfying this scope, we employ Pearson Correlation Coefficient and Spearman Correlation Coefficient. The correlation coefficient, which ranges from -1 to +1 is both a measure of the strength of the relationship and the direction of the relationship. Pearson Correlation Coefficient (r) is calculated by following equation:

The correlation coefficient, which ranges from -1 to +1 is both a measure of the strength of the relationship and the direction of the relationship. A correlation coefficient of 1 describes a perfect relationship in which every change of +1 in one variable is associated with a change of +1 in the other variable. A correlation of -1describes a perfect relationship in which every change of +1 in one variable is associated with a change of -1 in the other variable. A correlation of 0 describes a situation in which a change in one variable is not associated with any particular change in the other variable. In other words, knowing the value of one of the variables gives you no information about the value of the other.

The following findings have gained from verifying correlation between factors via Pearson Correlation Coefficient and Sig.

Insert Table 5 Here

- In according to Pearson Correlation results, the highest correlation is between Port Logistics and Availability at the 0.01 level of Pearson Sig. The Correlation Coefficient between them is 0.590.
- In according to Pearson Correlation results, Port Strategy and Policy and Port Regional Service have correlation at the 0.05 level of Pearson Sig. The Correlation Coefficient between them is 0.131.
- As Pearson Correlation results shows, there is no correlation between Port Logistics and Sipping Maritime Service.
- As Pearson Correlation results shows, there is no correlation between Hinterland Condition and Port Regional Service.
- As Pearson Correlation results shows, there is no correlation between Availability and Port Regional Service.

- In according to Pearson Correlation results, Shipping Maritime Service and Shipping Agreement and Port Service and Connectivity have correlation with all other factors at the 0.01 level of Pearson Sig.

4.2 Friedman Test Result

The Friedman test is applicable to problems with repeated-measures designs or matched-subjects designs. Friedman test is used to analyze the equality of preferences of components. In this research, we make an attempt to find out whether the preferences of 8 factors are equal or at least 2 factors have different preferences. We analyze the Relation between differences via H_0 and H_1 test. The interpretation of H_0 is the equality of preferences of factors, and the interpretation of H_1 is the difference at least between two factors. In according Friedman test, since the Sig. is less than 0.05, so the H_0 is not acceptable and the effect of all the factors on competitiveness of Shahid Rajaee port and shipping is not the same. Friedman test points that the factor of *Port Regional Service* is the most important factor and has the greatest effect on competitiveness of Shahid Rajaee port and shipping.

The classification of factors as point of preference in accordance with Freidman test is as the following:

- Port Regional Service
- Port Service and Connectivity
- Shipping Agreement
- Shipping Maritime Service
- Hinterland Condition
- Port Logistics
- Availability
- Port Strategy and Policy

The main component from the clusters of Port Regional Service which has the greatest effect on competitiveness of Shahid Rajaee Port and Shipping is the Port Location. The second important component in competitiveness of the port and shipping is Competitive Advantage of Port in Ships Route. It is one of the clusters of port service and connectivity.

5. Conclusion

This paper contribute the first study of port competitiveness in Iran, although the existing literature has pointed out the importance of competitiveness for port but empirical work on this issue is very limited in Asia. The purpose of this paper is to determine the components and evaluate the factors which have the high impact on the competitiveness of Shahid Rajaee port and shipping lines. The identified competitiveness of attributes of shahid Rajaee port contains Port Strategy and Policy; Port Logistics; Hinterland Condition; Availability; Shipping Maritime Service; Port Regional Service; Shipping Agreement; and Port Service and Connectivity. It enables port manager to draw practical marketing strategy by knowing these attributes and absorb the huge useful terrific in this port.

References

Bichou, K. (2004). A logistics and supply chain management approach to port performance measurement. *Maritime Policy & Management*, 31(1), 47-67. http://dx.doi.org/10.1080/0308883032000174454

Bichou, K., Gray, R. (2005). A critical review of conventional terminology for classifying seaports. *Transportation Research Part A: Policy and Practice,* 39(1), 75-92. http://dx.doi.org/10.1016/j.tra.2004.11.003

Blanc, L., Wyckoff, P. (1998). A strategic success factor analysis of the New Orleans vessel traffic service. *Transportation Journal*, 38(3), 44-50.

Brooks, M. (1984). An alternative theoretical approach to the evaluation of liner shipping-Part 1. Situational factors. *Maritime Policy and Management*, 11(1), 35-43. http://dx.doi.org/10.1080/03088838400000032

Brooks, M. (1985). An alternative theoretical approach to the evaluation of liner shipping – Part 2: choice criteria. *Maritime Policy and Management*, 12(2), 145-155. http://dx.doi.org/10.1080/03088838500000050

Carbone, V. (2003). The changing role of ports in supply-chain management an empirical analysis. *Maritime Policy and Management*, 30(4), 305-320. http://dx.doi.org/10.1080/0308883032000145618

Collison, F. (1984). North to Alaska: marketing in the Pacific Northwest-Central Alaska liner trade. *Maritime Policy and Management*, 11(2), 99-112. http://dx.doi.org/10.1080/03088838400000003

Cronbach, L. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16, 297-334. http://dx.doi.org/10.1007/BF02310555

Cullinane, K. (2002). A stochastic frontier model of the efficiency of major container terminals in Asia: assessing the influence of administrative and ownership structures. *Transportation Research*, A(36), 743-762. http://dx.doi.org/10.1016/S0965-8564(01)00035-0

De Martino, M. (2003). The changing role of ports in supply-chain management: an empirical analysis. *Maritime Policy and Management*, 30(4), 305-320. http://dx.doi.org/10.1080/0308883032000145618

De Souza, G. A. (2003). Liner shipping companies and terminal operators: internationalization or globalization? *Maritime Economics and Logistics*, 5, 393-412.

Gray, R. (2004). A logistics and supply chain management approach to port performance measurement. *Maritime Policy & Management*, 31(1), 47-67. http://dx.doi.org/10.1080/0308883032000174454

Ha, M. (2003). A comparison of service quality at major container ports: implications for Korean ports. *Journal of Transport Geography*, 11(1), 131-137. http://dx.doi.org/10.1016/S0966-6923(02)00069-8

Heng, W., Tongzon, J. L. (2005). Port privatization, efficiency and competitiveness: some empirical evidence from container ports. *Transportation Research*, A(39), 405-424. http://dx.doi.org.libproxy1.nus.edu.sg/10.1016/j.tra.2005.02.001

Kent, J., Parker, R., Luke, R. (2001). An empirical examination of shipper perceptions of service selection attributes in five truckload industry. *Transportation Journal*, 51(3), 27-36.

Lu, C., Marlow, P. (1999). Strategic groups in Taiwanese liner shipping. *Maritime Policy and Management*, 26(1), 1-26. http://dx.doi.org/10.1080/030888399287032

Malchow, M., Kanafani, A. (2001). A disaggregate analysis of factors influencing port selection. *Maritime Policy and Management*, 28(3), 265-277. http://dx.doi.org/10.1080/03088830110060840

McCalla, R. (1994). Canadian Container: How have they fares? How will they do? *Maritime Policy and Management*, 21(3), 207-217.

Murphy, P., Dalenberg, D., Daley, J. (1988). A contemporary perspective on international port operations. *Transportation Journal*, 28(1), 23-31.

Murphy, P., Dalenberg, D., Daley, J. (1989). Assessing international port operations. *International Journal of Physical Distribution and Materials Management*, 19(9), 3-10. http://dx.doi.org/10.1108/EUM0000000000334

Murphy, P., Dalenberg, D., Daley, J. (1991). Analysing international water transportation: the perspectives of large U.S. industrial corporations. *Journal of Business Logistics*, 12(1), 169-190.

Murphy, P., Daley, J., Dalenberg, D. (1992). Port selection criteria: an application of a transportation research framework. *Logistics and Transportation Review*, 28(3), 237.

Notteboom, T. E. (2005). Port regionalization: towards a new phase in port development. *Maritime Policy & Management*, 32(3), 297-313. http://dx.doi.org/10.1080/03088830500139885

Nova´k, A., Christine, L., Abetz, L. (2004). Development and validation of an acceptability and satisfaction questionnaire for a contraceptive vaginal ring. *Pharmaco Economics*, 22(4), 245-256. http://dx.doi.org/10.2165/00019053-200422040-00003

Panayides, P. M. (2007). *Development of ameasurement instrument for port supply chain orientation.* Paper presented at the In: Proceedings of the IAME Annual Conference 2007, 2–4 July, Athens, Greece.

Pearson, R. (1980). *Containerline Performance and Service Quality*: University of Liverpool.

Peters, H. (1990). *Structural changes in international trade and transport markets: the importance of markets*. Paper presented at the The 2nd KMI International Symposium.

Robinson, R. (2002). Ports as elements in value-driven chain systems: the new paradigm. *Maritime Policy and Management*, 25(1), 21-40. http://dx.doi.org/10.1080/03088830210132623

Rodrigue, J. P. (2005). Port regionalization: towards a new phase in port development. *Maritime Policy & Management*, 32(3), 297-313. http://dx.doi.org/10.1080/03088830500139885

Slack, B. (1985). Containerization inter-port competition and port selection. *Maritime Policy and Management*, 12(4), 293-303. http://dx.doi.org/10.1080/03088838500000043

Song, D. W. (2007). *Development of a measurement instrument for port supply chain orientation.* Paper presented at the Proceedings of the IAME Annual Conference 2007, 2–4 July, Athens, Greece.

Starr, J. (1994). The mid-Atlantic load centre: Baltimore or Hampton Road? *Maritime Policy and Management*,

21(3), 219-227. http://dx.doi.org/10.1080/03088839400000045

Tracey, M. (2004). Transportation effectiveness and manufacturing firm performance. *International Journal of Logistics Management*, 15(2), 31-49. http://dx.doi.org/10.1108/09574090410700293

UNCTAD. (1992). Port Marketing and the Challenge of the Third Generation Port„ pp. 358-361.

Ware, J., Kosinski, M., Gandek, D. (1998). The factor structure of the health survey in 10 countries. *International Quality of Life Assessment*, 51, 159-165.

Willingale, M. (1981). The Port routing behaviour of short sea ship operator theory and practices. *Maritime Policy and Management*, 8(2), 109-120. http://dx.doi.org/10.1080/03088838100000032

Yeo, G.-T., Roe, M., Dinwoodie, J. (2008). Evaluating the competitiveness of container ports in Korea and China. *Elsevier, Transportation Research* . A(42), 910-921. http://dx.doi.org/10.1016/j.tra.2008.01.01

Table 1. Respondents' Profiles

Gender	Frequency	Percent
Male	215	67.2
Female	105	32.8
Total	320	100.0
Age		
	5	1.6
Under 18	4	1.3
18 - 25	129	40.3
26 - 35	157	49.1
36 - 45	22	6.9
46 – 55	3	0.9
More than 55	320	100.0
Total		
Educational Level		
	15	4.7
Diploma	93	29.1
Associate of Art	149	46.6
BS	63	19.7
MS	320	100.0
Total		
Job Profiles		
	14	4.4
Manager	65	20.3
High Expert	117	36.6
Executive Expert	32	10.0
Port Operator	47	14.7
Terminal Operator	45	14.1
Others	320	100.0
Total		

Table 2. Components of Competitiveness for Shahid Rajaee port and Shipping Lines

Component
1. Frequency of cargo loss and damage
2. Frequency of large container ship's calling
3. Frequency of ship's calling and diversify of ship's route
4. Level of ship's entrance and departure navigation aids systems
5. Number of direct calling of ocean-going vessel
6. Professionals and skilled labors in port operation
7. Ship's safety and security
8. Reliability of schedules in port
9. Sophistication level of port information and its application scope
10. Port Infrastructure And Superstructure
11. Service capacity for ship's size
12. Accessibility (navigation distance)
13. Availability of vessel berth on arrival in port
14. Service differentiation
15. Cost for cargo handling, transfer and storage (port tariff)
16. Cost related vessel entering
17. Well-articulated logistics flow that includes intermodality and added-value operation
18. Efficient inland transport network
19. Free dwell time on the terminal
20. Port Software Capacity
21. Hinterland Access
22. Port competition (internal, international, between terminals)
23. Inland transportation cost
24. Inter-modal link
25. Level of service for fresh water, bunkering and ship's products, repair
26. Deviation From Main Trunk Route
27. Hub & spokes network
28. Port congestion
29. Port safety and security
30. Maritime dependence factors (MDF)
31. Recognition and reputation of port(Brand Image)
32. Reliability of schedules in port(stability of services for shipping line and shipper)
33. Free economic zone (FEZ)
34. Special economic zone (SEZ)
35. Port location (geographically)
36. Port productivity
37. Port capacity and size
38. Port community
39. 24 h a day, seven days a week service
40. Water depth in approach channel and at berth
41. Zero waiting time service
42. Port cluster
43. Port strategic planning
44. Port marketing strategy
45. Flexibility of rules & regulation
46. Port privatization
47. Adaptability to the changing market environment
48. Customs clearance system
49. Mutual agreement of port users
50. Trade/commerce policy

Table 3. Loadings on Each Factor Extracted from Rotated Component Matrix

Variables	Factor							
	1	2	3	4	5	6	7	8
32. Reliability of Schedules in Port	0.703							
36. Port Productivity	0.695							
31. Recognition and Reputation of Port	0.686							
43. Port Strategic Planning	0.730							
44. Port Marketing Strategy	0.766							
45. Flexibility of Rules & Regulation	0.672							
18. Efficient Inland Transport Network		0.693						
23. Inland Transportation Cost		0.672						
20. Port Software Capacity		0.557						
09. Sophistication Level of Shipping Information Software and System		0.681						
10. Port Infrastructure And Superstructure		0.659						
38. Port Community		0.215						
27. Hub & Spokes Network			0.707					
26. Deviation From Main Trunk Route			0.667					
28. Port Congestion			0.651					
08. Reliability of Schedules in Shipping			0.771					
07. Ship Safety and Security			0.761					
02. Frequency of Large Container Ship Calling			0.414					
14. Service Differentiation				0.787				
13. Availability of Vessel Berth on Arrival in Port				0.783				
17. Well Articulated Logistics Flow and Added-Value Operation				0.277				
12. Port Accessibility (Navigation Distance)				0.803				
11. Ship Capacity and Size				0.777				
22. Port Competition				0.273				
03. Frequency of Ships Calling and Diversify of Ship Route					0.669			
01. Frequency of Cargo Loss and Damage					0.729			
05. Number of Direct Shipping Lines of Ocean-Going Vessel					0.437			
40. Water Depth in Approach Channel and at Berth					0.779			
37. Port Capacity and Size					0.526			
42. Port Cluster					0.350			
35. Port Location (Geographically)						0.758		
34. Special Economic Zone (SEZ)						0.380		
33. Free Economic Zone (FEZ)						0.312		
15. Cost for Cargo Handling, Transfer and Storage						0.729		
24. Inter-Modal Link						0.571		
16. Cost Related Vessel Entering						0.547		
50. Trade and Commerce Policy							0.737	
49. Mutual Agreement of Port Users							0.563	
47. Adaptability to the Changing Market Environment							0.268	
25. Level of Service for Fresh Water, Bunkering, Ship products and Repair							0.659	
19. Free Dwell Time on the Terminal							0.654	
30. Maritime Dependence Factors (MDF)							0.294	
48. Customs Clearance System								0.780
39. 24 Hour a Day, Seven Days a Week Service								0.629
41. Zero Waiting Time Service								0.224
04. Level of Ship Entrance and Departure								0.695
21. Hinterland Access								-0.457
06. Professionals and Skilled Labors in Shipping Operation								-0.210

Table 4. Loadings on Each Factor Extracted from Rotated Component Matrix

Variables	Cronbach's α
Port Strategy and Policy	0.874
Port Logistics	0.842
Hinterland Condition	0.698
Availability	0.769
Shipping Maritime Service	0.759
Port Regional Service	0.798
Shipping Agreement	0.753
Port Service and Connectivity	0.737

Table 5. Correlations with Pearson Coefficient

		Port Strategy Policy	Port Logistics	Hinterland Condition	Availability	Shipping Maritime Service	Port Regional Service	Shipping Agreement	Port Service And Connectivity
Port Strategy Policy	Pearson Cor.	1							
	Sig. (2-tailed)								
	N	320							
Port Logistics	Pearson Cor.	0.485**	1						
	Sig. (2-tailed)	0.000							
	N	320	320						
Hinterland Condition	Pearson Cor.	0.365**	0.501**	1					
	Sig. (2-tailed)	0.000	0.000						
	N	320	320	320					
Availability	Pearson Cor.	0.370**	0.590**	0.407	1				
	Sig. (2-tailed)	0.000	0.000	0.000					
	N	320	320	320	320				
Shipping Maritime Service	Pearson Cor.	0.410**	0.353**	0.310**	0.298**	1			
	Sig. (2-tailed)	0.000	0.000	0.000	0.000				
	N	320	320	320	320	320			
Port Regional Service	Pearson Cor.	0.131*	0.400**	-0.004	-0.064	0.144**	1		
	Sig. (2-tailed)	0.019	0.019	0.937	0.252	0.010			
	N	320	320	320	320	320	320		
Shipping Agreement	Pearson Cor.	.400**	0.216**	0.209**	0.224**	0.273**	0.182**	1	
	Sig. (2-tailed)	0.019	0.000	0.000	0.000	0.000	0.001		
	N	320	320	320	320	320	320	320	
Port Service and Connectivity	Pearson Cor.	0.304**	0.355**	0.326**	0.249**	0.308**	0.163**	0.246**	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.003	0.000	
	N	320	320	320	320	320	320	320	320

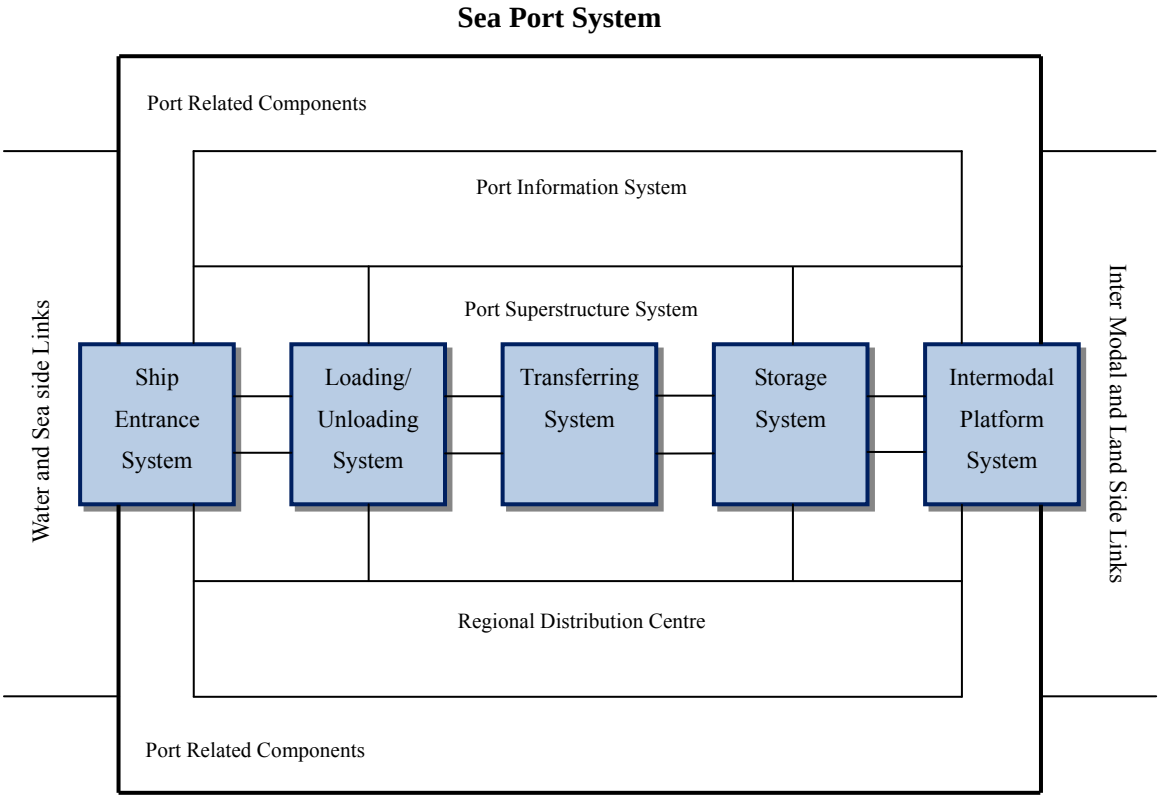

Figure 1. Selection of Determinants of Competitiveness of Port and Shipping Lines (Gi-Tae Yeo, 2008)

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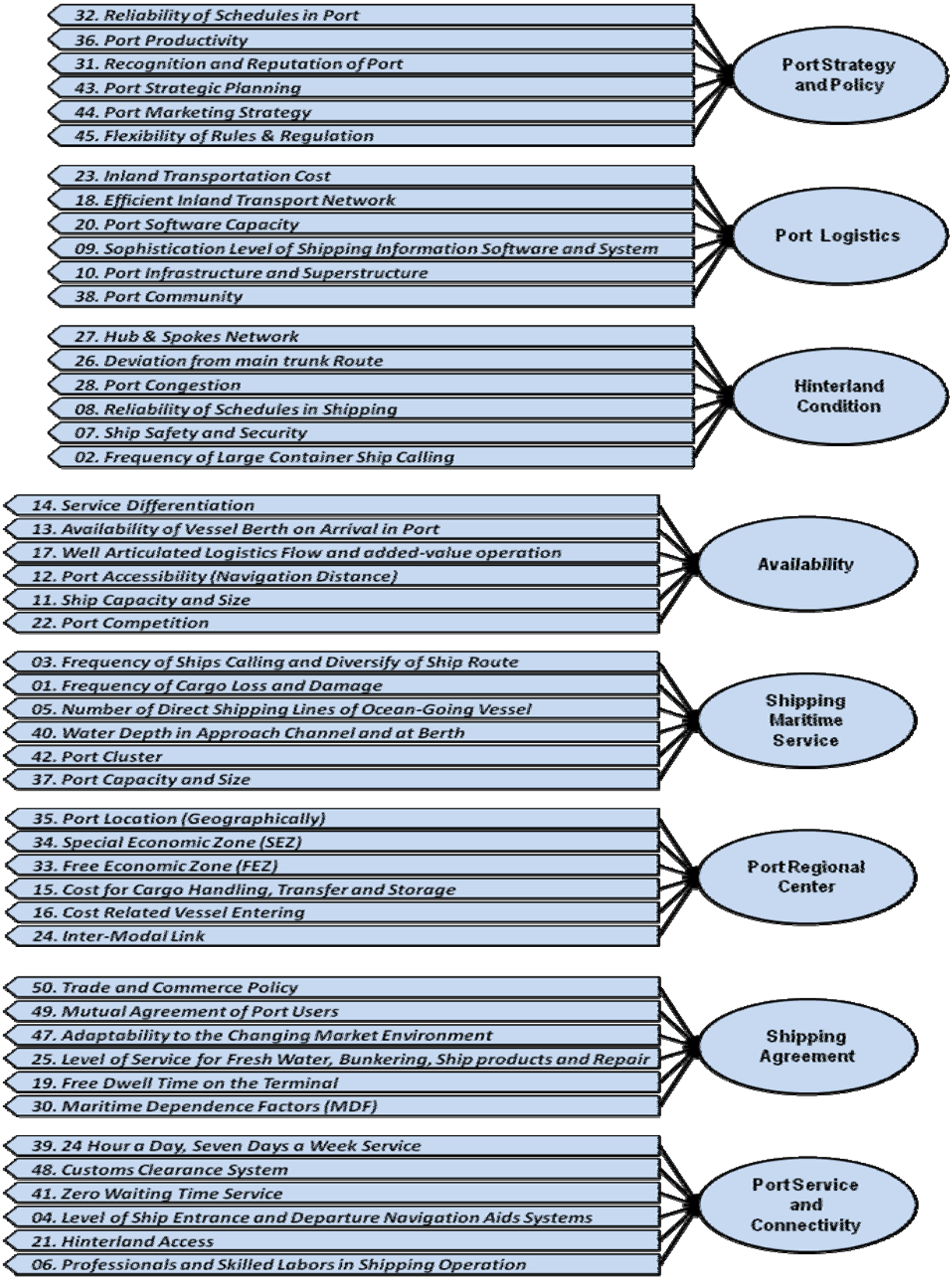

Figure 2. Proposed Model for Evaluating of Port Competitiveness Marketing Strategy

The Impact of Autocratic and Democratic Leadership Style on Job Satisfaction

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Abstract

This current research investigates the impact of Autocratic and Democratic Leadership style on job satisfaction in private and public school. For this purpose a questionnaire was developed and validated. There were twenty three items in all. The items were based on five point scale (from almost always to almost never).The data were collected from two hundred and five (205) teachers of both public and private schools (one hundred and five public school teachers and one hundred private school teachers). For statistical analysis Mean, Standard Deviation, T-Test, ANOVA, Co relation and Regression Analysis were used. It was found that Leadership style has a positive impact on job satisfaction and public teachers have high level of job satisfaction rather than private teachers.

Keywords: Autocratic, Democratic, Leadership, Job Satisfaction

1. Introduction

Leadership is a social influence process in which the leader seeks the voluntary participation of subordinates in an effort to reach organization goals, a process whereby one person exerts social influence over other members of the group, a process of influencing the activities of an individual or a group of individuals in an effort towards goal achievement in given situations, and a relational concept involving both the influencing agent and the person being influenced.

Effective leadership is the extent to which a leader continually and progressively leading and directing his/her followers to the agreed destination which is defined by the whole group. Bass theory of leadership states that there are three basic ways to explain how people become leaders. The first two explain the leadership development for a small number of people. These theories are,

1) Some personality traits may lead people naturally into leadership roles. This is the trait theory.

2) A crises or important event may cause a person to rise to the occasion which brings out extra ordinary leadership qualities in an ordinary person. This is the Great events Theory.

3) People can choose to become leaders. People can learn leadership skills. This is the transformational leadership Theory. It is the most widely accepted theory

Leadership style is the pattern of behaviors engaged in by the leader when dealing with employees. Lewin, Lippit and White (1939) identified three leadership styles which are

- Autocratic
- Democratic
- Laissez-faire.

1.1 Democratic Leadership Style

Although a Democratic leader will make the final decision, he/she invites other members of the team to contribute the decision making process. This not only increases job satisfaction by involving employees or team members in what's going on, but it also help to develop people's skills. Employees and team members feel in control of their own destiny, such as the promotion they deserve and so are motivated to work hard by more than just a financial reward. As participation takes time, this approach can lead to things happening more slowly but often the end result is better. The approach can be most suitable where team work is essential and quality is more important than speed to market productivity.

The Laissez-Faire Leadership Style

The laissez-faire leadership style involves non-interference policy, allows complete freedom to all workers and has no particular way of attaining goals. However, there is no one best style of leadership. The effectiveness of a particular style is dependent on the organizational situation.

Organization is an entity which is set up for a purpose. Organization can be defined as the human co-ordination of a number of persons or individuals in the service of mutual help for the achievement of common goals through the division of labor and functions, and through hierarchy of authority.

1.2 Objectives of the Study

- To differentiate between Autocratic and Democratic Leadership Styles.
- To investigate the relationship between
  - Style of leadership and sense of belongingness among the workforce.
  - Style of leadership and job related tension.

1.3 Research Questions / Hypothesis

H_o 1 Workers under democratic style of leadership will show improvement in quality of their work than workers under autocratic style of leadership.

H_o 2 Workers under autocratic leadership style will experience higher job-related tension than workers under democratic leadership style.

2. Literature Review

2.1 Leadership

A leader is a person who sees something that needs to be done, knows that they can help make it happens and gets started. A leader sees opportunity and captures it. He/she sees future that can be different and better and help others see that picture too. He/she is a coach, an encourager and is willing to take risks today for something better for tomorrow. A leader is a communicator, co-ordinator and listener.

2.2 History

Smith (1998) asserts that if the task is highly structured and the leader has good relationship with the employees, effectiveness will be high on the part of the employees. His findings further revealed that democratic leaders take great care to involve all members of the team in discussion, and can work with a small but highly motivated team.

Schwartz (1987) found a high submissiveness among workers in democratic organizations, but those in autocratic organizations expressed frustration and anger. Bales (1970) found two different categories of specialist in work groups. These are task specialist and social-emotional specialist. The task specialist is concerned with the achievement of the group goals while the social-emotional specialist is concerned with maintaining positive social

relationship within the group and motivating the group members to accept the goals of the group. However, a good leader can combine the two roles (Roger & Roger, 1994). The two categories actually distinguished two different style of leadership namely autocratic and democratic. Lewin et al (1939) concluded that democratic style of leadership is the most effective, but Smith and Peterson (1988) pointed that the effectiveness of group leaders is dependent on the criterion which was being used to assess leadership. Thus, if leadership is assessed in terms of productivity, then autocratic style is most efficient but if the role is seen as maintaining good morale and a steady level of work, democratic style is effective. Absence of leadership style brings about lack of direction from the leader resulting in low morale and lack of interest in the work. Hayers (2000) found that workers who fell under pressure reported autocratic supervision on the part of their leaders. The leaders rarely allowed them to participate in the decision making. It was also reported that workers who were under stress also reported harsh supervision and control on the part of their leaders (Hayers, 2000). The availability of social support, both on and off the job, is a crucial determinant of organizational stress (Cohen & Wills, 1985). Apparently, the presence of social support helps reduce the outcome of stress by serving buffer against stressful event that occur at work (Landsbergis, Schnall, Deitz, Friedman & Pickering, 1992). Gender role also affects job tension. Strong feeling of community increases the flow of information among workers (Bruffee, 1993; and Dede, 1996). Workers benefit from community membership by experiencing a greater sense of well-being and support (Walker, Wassermann & Wellman, 1994; and Wellman & Gillia, 1999). Royal and Rossi (1996) opined that sense of community is related to engagement in work activities. There is need for workers to have sense of connectedness which affect the workers' ability to cope. Lack of connectedness breeds loneliness, low self esteem, isolation, low achievement, low motivation and low productivity (Gibbs, 1995). Sense of belonging and the feeling of connectedness indicate the presence of trust relationship and togetherness among the workers (Preece, 2000). The extent to which a job gives an employee opportunity to interact with other co-workers enhances the sense of community at work (Camman, Fischman, Jenkins & Wesh, 1983), but the organizational climate which will pave way for such interaction is determined by the leadership style (Buckner, 1988). Kreitner & Kinicki (1998) observed that lack of support from co-workers goes a long way to contribute to stress in organization which could hinder sense of belonging. Likewise, members of dissimilar groups who experiences trauma cannot feel a sense of connectedness (Ottenberg, 1987). Young and Erickson (1988) noted that workers who experience isolation at work are prone to increased vulnerability to traumatic stress disorders.

3. Research Methodology

In the preceding chapter, it was tried to review the literature related to the problem. This chapter consists of methodology used for the study.

3.1 Research Population

The population of the study was the male and female teachers of different schools of the city both public and private. It was decided to include population of different ages and education.

3.2 Sampling Technique

Sampling Techniques helped to select representative units from which data could be gathered. It helped to draw inference about the nature of the entire population. Participants/sample of the study was selected on convenient sampling techniques basis. Participants of the study were 205 randomly selected teaching staff comprising of both male and female both from private and public schools. They were comprised of junior and senior ones. Their age ranged between twenty and fifty-five years while the minimum educational qualification of the teachers was the intermediates.

3.3 Pilot Testing

For pilot testing, the questionnaire was administered to twenty teachers teachers (ten from public schools and ten from private schools).two questions were deleted and three were added up to the part A of the questionnaire where as five questions were deleted and only one was added to the second part of the questionnaire by the researcher. Finally there were twenty three items in the tool.

For the collection of data regarding the study researcher visited nearly fifteen schools of Lahore both private and public.

3.4 Research Variables

Leadership styles (autocratic and democratic) was the independent variables while the dependent variable was job-related tension.

4. Data Collection

This research used the primary and secondary data. The instrument used for the collection of the primary data was questionnaire containing questions to measure the effect of autocratic or democratic leadership style on workers.

The secondary data constituted relevant literature such as journals, reports internet and related books which contributed to the development of study.

4.1 Statistical Analysis

The following statistical were used,

1. Mean
2. Standard deviation
3. Correlation
4. T-test
5. ANOVA.
6. Regression Analysis

4.2 Data Analysis and Interpretation

The study was conducted to investigate "The impact of autocratic and democratic leadership style on job satisfaction" with a sample of 205 teachers both male and female of public and private schools. The data was collected through questionnaire and the collected data was analyzed through computer software SPSS version 13.

Leadership style correlated with job satisfaction-the correlation is .249, $p<.001$, indicating that there highly significant positive relationship found to be between leadership style and job satisfaction in terms of their mutual connection. The higher the employees score are on democratic type of a leadership style, the more job satisfaction they will seek. thus it is concluded leadership style yield healthy degree of impact upon the employees satisfaction and quality improvement as indicated by the trend line and further the hypothesis that leadership style constitute effect on satisfaction and quality proven to be true.

A reliability analysis using the Cronbach's Alpha was performed to determine to what extent items are related to each other. The reliability indices reveal that all of the two factors items are greatly connected with each other and measuring the same construct.

4.3 Distribution of Item Means of Leadership Style Factor

Table 1 shows that for total 205 employees the mean score is 3.85 (SD = 1.19) that indicates that in democratic leadership style employees have courage to share their mistakes with their leaders so that they can have better opinion from their leaders.

Table 2 shows that for total 205 employees the mean score is 3.85 (SD = 1.19) . It shows that democratic leader knows how the employees can use their creativity and ingenuity to solve the organizational problems as the prosperity of the organization means the prosperity of the employees.Whenever you make a mistake your leader politely tell you and advise you not to do it again

Table 3 Table shows that for total 205 employees the mean score is 3.70 (SD = 1.11). It shows that employees are of the view that democratic leaders behaves politely and advise their employees for not doing mistakes again and they should be careful.

- Your Leader asks for the ideas of employees for up-coming plans and project.

Table 4 shows that for total 205 employees the mean score is 3.66 (SD = 1.14).It indicates that democratic leader gives preference to take ideas of the employees for coming projects and plans for making better decision.

- Your leader allows you to determine what needs to be done and how to do it in your assignment.

Table 5 shows that for total 205 employees the mean score is 3.60 (SD = 1.14) It shows that whenever assignments are given to employees, democratic leader leaves it to the employees to suggest by themselves what they would like to do and how they feel easy for its completion.

- About any matter/decision, suggestions of the employees are also considered

- Tabl 6. shows that for total 205 employees the mean score is 3.59 (SD = 0.93)It shows that democratic leader collects the suggestions of the employees for about any kid of decision .The suggestions of the employees are also considered which increases the sense of ownership of the organization by the employees and enhances their interest in their jobs.

6. Leader considers the suggestions of the employees while making a decision

Table 7 shows that for total 205 employees the mean score is 3.52 (SD = 1.03). It shows that for decisions of the organization, democratic leader considers the suggestions of the employees.

7. Your leader create an environment where the employees take ownership of the project and he/she allows you to participate in the decision making process.

Table 8 Distribution mean and Std.deviation

Table shows that for total 205 employees the mean score is 3.46 (SD = 1.10). It shows that democratic leader always tries to create such kind of environment in which all employees feel easy to work and they are asked to participate in decision making in organization mattes this create a sense of ownership among the employees and they work more enthusiastically. Whenever there is difference in expectation your leader works with you to resolve it.

8. Employees are threatened or punished if they do wrong or mistakes have done by them in order to achieve organization goals.

Table 9 shows that for total 205 employees the mean score is 3.46 (SD = 1.10). It shows that in democratic leadership environment, leader always tries to solve any kind of differences in expectation

Table shows that for total 205 employees the mean score is 3.39 (SD = 1.18). It shows that in autocratic leadership style employees are always threatened or punished if they make mistakes because the organization wants to achieve its goals.

9. Employees always vote whenever a major decision has to be made

Table 10 shows that for total 205 employees the mean score is 3.11 (SD = 1.17). It shows that voting is also done before taking any major decision for the organization.

10. For a major decision to pass in the department/organization. It has the approval of the employees.

Table 11 shows that for total 205 employees the mean score is 2.89 (SD = 1.24) .It shows that in autocratic leadership style, leaders implement their decisions on the employees and do not consider the opinion of their employees.

11. Your leader likes the power that he/she holds over his/her subordinates

Table 12 shows that for total 205 employees the mean score is 2.50 (SD = 1.19). It shows that democratic leader does not like the powers that he/she holds over their employees.

12. Your leader considers his/her decision as final

Table 13 shows that for total 205 employees the mean score is 2.24 (SD = 1.18). It shows that democratic leader does not consider his/her decision as a final.

Overall statistics

Table 14 illustrates that overall mean of the factor leadership style is 3.34 indicating that employees facing generally a democratic sort of a leadership from theirs leaders. Employees reported that they do inform the leader if something goes wrong, and the leader have polite dealings with the employees and have trust on them. According to the employees leader also considers suggestions, allows participating in decisions, and works with to resolve problems. Employees showed that the leaders likes the power, considers their decisions as final and they do not been consulted when major decisions announced.

Distribution of Item Means of Job Satisfaction Factor

Do you like to go to your job?

Table-15-shows that for total 205 employees the mean score is4.64 (SD = 0.66) . It shows that employees are satisfied in democratic leader ship style and they like to go to their jobs.

16. Do you think about the betterment of your organization and share your ideas with your leader?

Table 16 shows that for total 205 employees the mean score is 4.06 (SD = 1.02) . It shows that in democratic leadership environment employees think about the betterment of their organization and for its betterment share their ideas with their leaders.

17. Do you feel that you are a apart of the organization and for its betterment you can take spot decisions?

Table 17 shows that for total 205 employees the mean score is 3.93 (SD = 1.13) . It shows that while working with democratic leaders employees feel that they are a part of the organization .This creates a sense of ownership among them and they take spot decisions.

18. Do you have liberty to exercise your decisions to fulfill your commitments?

Table 19 shows that for total 205 employees the mean score is 3.88 (SD = 1.05). It shows that in democratic leadership styles, employees are free to take decisions by themselves for the completions of their commitments.

20 . Do you feel sick/uneasy while doing your jobs

Table 20 shows that for total 205 employees the mean score is 3.86 (SD = 1.28). It shows that in autocratic leadership style employees feel uneasy while doing their jobs.

21. Do you like to do extra time to your job so that your assignments can be finished early/in time?

Table 21 shows that for total 205 employees the mean score is 3.74 (SD = 1.13). It shows that in democratic leader ship style employees work freely and with peace of mind, they like to do extra time to your job so that your assignments can be finished early/in time.

22. Can you talk freely about any matter to your leader?

Table 22 shows that for total 2005 employees the mean score is 3.46 (SD = 1.15) . It shows that employees talk freely with their leaders who are having democratic leadership style about any matter.

23. Do you want to change your job and have better than this job?

Table 23 shows that for total 205 employees the mean score is 3.31 (SD = 1.54) . It shows that while working with democratic leader, employees are satisfied and they do not want to change their jobs for better jobs.

24. Do you think that you will never change this job?

Table- 24-shows that for total 205 employees the mean score is 3.29 (SD = 1.53) . It shows that as employees are satisfied with their democratic leader and working environment, they do not like to change their jobs.

25. Overall factor statistics

Table 25 illustrates that overall mean of the factor leadership style is 3.80 indicating that employees facing generally a democratic sort of a leadership from theirs leaders. Employees reported that they are satisfied with their jobs and they do not think or like to change their jobs for more better jobs. According to the employees leader also allows them to take part in making decisions, and their implementations to resolve problems. Employees showed that they like to go to their jobs.

5. Conclusion and Recommendations

The study was aimed to find the relationship between leadership style and job satisfaction among the teaching staff comprising of both male and female from public and private schools of Lahore. The main objective of the study was to find out the relationship between leadership style and job satisfaction. For this purpose, the questionnaire was developed; there were 23 variables in all. All questions were close ended. It was administered to 205 school teachers both male and female of public and private schools of Lahore. The data was analyzed through SPSS and the findings, conclusion and recommendations are given below. The study will help us to find out the impact of leadership style on the working and output of employees and their job satisfaction. The male and female have same level of job satisfaction. As both work in similar position Public teachers have high level of job satisfaction because in private sector job is not secure as it is in public sector. Leadership style has a positive impact on job satisfaction. People like to work in free atmosphere where they can share and exchange their views. Employees tell their leaders fearlessly in case of any thing wrong. This creates a sense of ownership among the employees that gives them satisfaction.

References

Antonakis, J., Avolio, B. J., & Sivasubramaniam, N. (2003). Context and Leadership: An Examination of the Nine-Factor Full-Range Leadership Theory Using the Multifactor Leadership Questionnaire. *Leadership Quarterly*, 14, 261-95. http://dx.doi.org/10.1016/S1048-9843(03)00030-4

Atwater, D. C., & Bass, B. M. (1994). *Transformational Leadership in Teams.* In Bass, B. M., & Avolio, B. J. (Eds.). *Improving organizational Effectiveness through Transformational Leadership*, (pp. 48-83) Thousand Oaks, CA: Sage.

Avolio, B. J. (1994). The Alliance of Total Quality and The Full Range of Leadership. In Bass, B. M., & Avolio, B. J. (Eds). *Improving organizational Effectiveness through Transformational Leadership,* (pp. 121-45) Thousand Oaks, CA: Sage.

Avolio, B. J. (1999). *Full Leadership Development.* Thousand Oaks, CA: Sage. www.mlq.com.au/position_feature_article.asp

Bales, R. F. (1970). *Interaction process analysis. Mass:* Addison-Wesley, 509.

Bales, R. F. (1970). *Interaction process analysis*. Mass: Addison-Wesley, 509.

Bass, B. M. (1985a). *Leadership and Performance Beyond Expectation*. New York: Free Press.

Bass, B. M. (1990). *Bass and Stogdill's Handbook of Leadership*, (3rd ed). New York: Free Press.

Bass, B. M., & Avolio, B. J. (1994). Introduction in Bass, B. M., & Avolio, B. J. (Eds). *Improving Organizational Effectiveness through Transformational Leadership,* (pp 1-10). Thousand Oaks, CA: Sage.

Blake, R. R., & Mouton, J. S. (1985). *The Managerial Grid III*. Houston, TX: Gulf.

Bossert, S. T., Dwyer, D. C., Rowan, B., & Lee, G. V. (1982).The Instructional Management Role of the Principal. *Educational Administration Quarterly*, 18, 36-64. http://dx.doi.org/10.1177/0013161X82018003004

Bruffee, K. A. (1993). *Collaborative learning*: Higher education, interdependence and the authority of knowledge. Baltimore: John Hopkins University Press, 125.

Bryman, A. (1996). Leadership in Organizations. In Clegg, S. R., Hardy, C., & Nord, W. R. (Eds), *Handbook of Organizational Studies*. Thousands Oaks, CA:Sage.

Buckner, J. C. (1988). The development of an instrument to measure neighborhood cohesion. *American Journal of Community Psychology*, 16(6), 771-791. http://dx.doi.org/10.1007/BF00930892

Burns, J. M. (1978). *Leadership*. New York: Harper & Row.

Camburn, E., Rowan, B., & Taylor, J. (2003). Distributed Leadership in Schools Adopting Comprehensive School Reform Models. *Educational Evaluation and Policy Analysis*, 25, 347-373. http://dx.doi.org/10.3102/01623737025004347

Camman, Fischman, Jenkins, & Wesh (1983) Assessing the attitude and perception of organization members. In S. Seashore (Ed.), *Assessing organizational changes*. New York: John Wiley, 71-73

Cohen, S., & Wills, T. A. (1985) Stress, social support and offering hypothesis. *Psychology Bulletin*, 310-357. http://dx.doi.org/10.1037/0033-2909.98.2.310

Collins, J. (2001). *Good to Great*. New York: Harper Business.

Table 1. Distribution Mean and Std.deviation

No	Variables	N	Mean	Std.deviaton
12	Whenever something goes wrong you tell your leader fearlessly.	205	3.85	1.19

Table 2. Distribution Mean and Std.deviation

No	Variable	N	Mean	Std.deviaton
11	Your leader thinks that you know how to use your creativity and ingenuity to solve organization problems	205	3.85	1.19

Table 3. Distribution Mean and Std.deviation

No	Variable	N	Mean	Std.deviaton
	Whenever you make a mistake your leader politely tell you and advise you not to do it again	205	3.70	1.11

Table 4. Distribution Mean and Std.deviation

No	Variable	N	Mean	Std.deviaton
10	Your leader allows you to determine what needs to be done and how to do it in your assignment.	205	3.60	1.14

Table 5. Distribution Mean and Std.deviation

No	Variable	N	Mean	Std.deviaton
3	About any matter/decision, suggestions of the employees are also considered	205	3.59	.93

Table 6. Distribution Mean and Std.deviation

No	Variable	N	Mean	Std.deviaton
5	Leader considers the suggestions of the employees while making a decision	205	3.52	1.03

Table 7. Distribution Mean and Std.deviation

No	Variable	N	Mean	Std.deviaton
13	Whenever there is difference in expectation your leader works with you to resolve it.	205	3.46	1.10

Table 8. Distribution Mean and Std.deviation

No	Variable	N	Mean	Std.deviaton
14	Employees are threatened or punished if they do wrong or mistakes have done by them in order to achieve organization goals.	205	3.39	1.18

Table 9. Distribution Mean and Std.deviation

No	Variable	N	Mean	Std.deviaton
4	Employees always vote whenever a major decision has to be made	205	3.11	1.17

Table 10. Distribution Mean and Std.deviation

No	Variable	N	Mean	Std.deviaton
7	For a major decision to pass in the department/organization. It has the approval of the employees.	205	2.89	1.24

Table 11. Distribution Mean and Std.deviation

No	Variable	N	Mean	Std.deviaton
2	Your leader likes the power that he/she holds over his/her subordinates	205	2.50	1.19

Table 12. Distribution Mean and Std.deviation

No	Variable	N	Mean	Std.deviaton
9	Your leader create an environment where the employees take ownership of the project and he/she allows you to participate in the decision making process.	205	3.46	1.10

Table 13. Distribution Mean and Std.deviation

No	Variable	N	Mean	Std.deviaton
1	Your leader considers his/her decision as final	205	2.24	1.18

Table 14. Distribution Mean and Std.deviation

No	Variable	N	Mean	Std.deviaton
Total	Overall statistics	205	3.34	.55

Table 15. Distribution Mean and Std. deviation

No	Variable	N	Mean	Std.deviation
1	Do you like to go to your job	205	4.64	.66

Table 16. Distribution Mean and Std.deviation

No	Variable	N	Mean	Std.deviation
9	Do you think about the betterment of your organization and share your ideas with your leader?	205	4.06	1.02

Table 17. Distribution Mean and Std.deviation

No	Variable	N	Mean	Std.deviation
6	Do you feel that you are a apart of the organization and for its betterment you can take spot decisions?	205	3.93	1.13

Table 18. Distribution Mean and Std.deviation

No	Variable	N	Mean	Std.deviaton
4	Do you have liberty to exercise your decisions to fulfill your commitments?	205	3.88	1.05

Table 19. Distribution Mean and Std.deviation

No	Variable	N	Mean	Std.deviaton
5	Do you feel sick/uneasy while doing your jobs	205	3.86	1.28

Table 20. Distribution Mean and Std.deviation

No	Variable	N	Mean	Std.deviaton
2	Do you like to do extra time to your job so that your assignments can be finished early/in time?	205	3.74	1.13

Table 21. Distribution Mean and Std.deviation

No	Variable	N	Mean	Std.deviaton
7	Can you talk freely about any matter to your leader?	205	3.46	1.15

Table 22. Distribution Mean and Std.deviation

No	Variable	N	Mean	Std.deviaton
3	Do you want to change your job and have better than this job?	205	3.31	1.54

Table 23. Distribution Mean and Std.deviation

No	Variable	N	Mean	Std.deviaton
8	Do you think that you will never change this job?	205	3.29	1.53

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Table 24. Distribution Mean and Std.deviation

No	Variable	N	Mean	Std.deviaton
Total	Overall factor statistics	205	3.80	.55

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.249[a]	.062	.057	.54301

a. Predictors: (Constant), leadrpsm

b. Dependent Variable: jobstm

The above table shows that the Sum of Square of Residual is 0.62, which is moderate and standarderd error of estimate is 0.54301.

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
1 (Constant)	2.887	.253		11.429	.000
leadrpsm	.273	.075	.249	3.664	.000

a. Dependent Variable: jobstm

The estimated Regression line isY= 2.887+0.273 X which shows that if the X=0 the Y will be 2.887 and With 1% increase in the variable X there will be 0.273 % increase in variable Y.

Table 25. Regression Analysis Residuals Statistics

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	3.3554	4.1165	3.8022	.13931	205
Residual	-1.34030	1.20014	.00000	.54168	205
Std. Predicted Value	-3.207	2.256	.000	1.000	205
Std. Residual	-2.468	2.210	.000	.998	205

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