
THE INTANGIBLE ASSETS IN THE SERVICE PROVIDERS COMPANIES AND ITS IMPACT IN THE PROFITABILITY

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ABSTRACT

Before the transformations that occurred by the technological innovations, the companies have been living in an intense competitiveness, where what makes them different are their invisible characteristics, i.e. the intangible asset. Therefore, this research analyzed the causal relationship between the participation of the intangible asset in the companies' structure and the profitability over the total investments. For such, it was analyzed Brazilian companies classified as service providers by BM&FBOVESPA from 2008 to 2012 implementing econometrics and statistical tools. The research has a descriptive character. The results suggest that the intangible assets influenced in a positive manner the profitability over the company in the matter, i.e. the bigger the participation in the intangible assets in the structure of the company the bigger will be its profitability.

Keywords: *intangible asset; service providers; profitability.*

1. INTRODUCTION

So many changes have been occurring in the world, such as technological innovations and the new social apparatus, i.e. the new perception of structure of the society, caused by relevant changes in the political and economic view. Nowadays, companies face a new resource, the information that transforms the knowledge in a differential, that goes beyond the social parameters, leaving from being something restrict to society, therefore, intersecting the financial-economic sphere creating new resources for decision-making (Antunes, 2000).

With so many new technologies, companies live in a fierce competitive environment. In which they compete among themselves with equity levels, highlighting the increase in the Intangible Assets' investment that are responsible for their differentiation in the market.

With the evolution of the values of society, it can be noticed a change in how it is visualized and analyzed what is relevant in the society structure, i.e., the position of individuals and groups within the social system. Within the society the Accountability is presented as a science of economic and social information that reports the evolution of the patrimonial collection that forms the richness of the diverse organizations/individuals or social groups.

In this moment, accountability, as it had occurred in its beginnings, have been instigated, challenged to present an answer to this new social configuration, in a way that within the organizations the intangible assets must be assessed and properly registered, being aggregated to the business assets (Antunes, 2000).

Intangible assets, such as brands, patents, public concessions and intellectual capital, for instance, are singular assets, which their unique characteristics could allow the differentiation among the companies and the obtaining of competitive advantages. Within this context, innumerable authors have confirmed that the creation of the companies' wealth is directly related to the intangible assets, because these assets would be responsible by the superior economic performances and by the generation of added values to the stakeholders [...] (Perez and Famá, 2006, p. 7)

The term Intangible Asset is composed by a variety of items that are hard to be evaluated, because a lot of the time they are subjective like the Intellectual Capital. Thus, there are difficulties to measure or predict with accuracy the assets that compose the intangible of the organization.

Within this context, the knowledge also starts to integrate the production factors of the economy. It characterized by being an intangible assets in an organization, however, on the opposite of the production factors that were only composed by dirt, work and capital, which are scarce, the knowledge is limitless and difficult to measure, because it depends of each individual's capacity. The basis of the economy that was supported by assets that could exhaust through time, today it lies in the intellectual capacity of the individuals that compose it (Schmidt and Santos, 2002).

This reality can be observed with the intense growth of service providers companies, which have as a resource to attract new clients, mainly, invisible characteristics such as reputation, and good quality in proving good services. Items like these are indispensable for this field that is in constant changes (Gonçalves, 1994).

With this new economic composition, entities are increasingly seeking accurate information about their intangible assets instigating the Accounting Science and exert its role in an efficient fashion, to subsidize the process of decision-making (Antunes, 2000).

In this way, considering the new economic scenario and the companies' necessities of value generation for their investors present as an opportunity to combine in the best way possible the tangible assets and the intangible assets, looking for the best interaction that can proportionate differentiates returns in the various organizations (Perez and Famá, 2006).

In the search to performance the main purpose, which it to inform the questions previously presented, it is of great challenge for the Accounting Sciences to find the best method of measurement, evaluation and control of intangible assets, and measure if the return of the companies' total investment are being affected by the use of these assets (Ebrati et al., 2013).

PROBLEM

The Law nº 11.638, from December 28th of 2007, that altered the Law nº 6.404, from December 15th of 1976 that discuss about the Stock Companies; among other things, altered the perspective that the counter owned over the intangible assets, that until then they were valued, although they were not counted neither demonstrated in the balance sheet (Lima, 2010).

The article 179 of the law nº 11.638/07, in item VI, stablish that in the intangible assets are going to be classified "the rights that have as a goal to designate the intangible assets to the adjustment of the company or exerted with this purpose, including acquired goodwill" (Brasil, 2007).

According to Iudícibus (2010, p. 265):

The natural consequence with the adoption by the Brazilian companies of the intangible group is that many of the registered and counted rubrics of other account groups were reclassified; there was a reduction on the "investments", "fixed assets" and "deferred" account groups, only highlighting that the

balances of the deferred that were not reclassified for the other groups can be kept until complete amortization or profits previously written off or accumulated losses.

Thus, the Brazilian companies turned out to demonstrate the Intangible Asset on their Patrimonial Balance Sheet, being now passive of analyses and comparisons. Before this new account groups, it is now faced with companies that own a greater intangible asset when compared to the others, considering that these intangible assets cannot be properly reflected in the financial demonstration, due to the difficulty of identification and evaluation of its components (Perez and Famá, 2006).

It is precisely these difficulties of measurement of the Intangible Assets, “could cause [...] a bigger gap between the stakeholders assets and the market value and the stakeholders assets reflected by the Traditional Accounting” (Perez and Famá, 2006, p.8).

There are many examples of millionaire acquisitions of companies that when verified their accounting value did not match with the real amount of the companies' value. This overvalue of the companies happened due to their intangible assets, because it sets, for example, its name in the market, and its strategically point of sales, its compromise with the clients and the give attention to them, among other characteristics.

In the face of the perspective that represents the intangible assets in the value generation for the organizations, it is questioned: What is the causal relation between the participation of the intangible assets in the company and the profitability over its total investments?

GOAL

The goal of this research is to analyze the companies of BM&FBOVESPA, classified as service providers, the causal relationship between the participation of the intangible assets in the company and the profitability over its total investments.

METHODOLOGY

The current study intends to verify if the bigger the participation of the intangible assets in the composition of the service providers companies, the bigger will also be their profitability over their total investments; it is characterized as a descriptive and quantitative study, since descriptive study, according to Andrade (2002), observes, registers, analyzes, classifies and interprets the facts, which the researcher do not interfere and as Gil (1999) emphasizes, “the descriptive study has as main goal to describe characteristics of certain population or phenomenon or the establishment of the relationships between the variables”. Additionally, in relation to the quantitative characteristic, according to Beuren (2009), it is due to the use of statistical tools in its elaboration.

For the performance of this study it will also be used the procedure of documentary analyses of the accounting demonstration of the Brazilian service providers companies with the negotiated shares in the stock market, BM&FBOVESPTA, constant in the data base of the software Economática® from 2008 to 2012, considering that Severino (2007, p. 124) emphasizes that the documentary research is a technique of identification, collection, and exploitation of documents that are sources of the studied object and record of the information taken from these sources and that will be used on the development of the study”.

In this study it will also be used the secondary sources, which will be raised through a bibliographic research of books, periodicals, articles, theses, monographs, websites, etc. that present question such as intangible assets and the total profitability.

The samples was obtained through the accounting information taken from the database of the software Economática® from 2008 to 2012, which is composed of 80 companies of the service providers' branch, being this research composed of 160 companies service providers with negotiated shares in the BM&FBOVESPA.

The utilized samples was not probabilistic, because it was selected according to the author's judgment, since the service providers companies were chosen due to its odd characteristics of being in a segment that sells intangible products and because of that, its intangible must be represented in an expressive value, since to perform the sales of its services, it needs to have a good reputation, brand, beyond the capacity of management and intellectual capital development and a great customer service.

The collected financial-economic data was returned over the equity capital, and indebtedness. Through the market value splitted by the equity capital, it was possible to calculate the intangibility of the company (GI), which in this study was used as a tool to measure the intangible asset.

The econometric model used in this research was the regression model with data in panel that was applied by the software Stata® v. 12.0. Having as a goal, through the data analysis of the sample, obtain information that prove if the degree of intangibility has significant relation with the return over the total investments.

2. REVIEW OF LITERATURE

2.1. TANGIBILITY AND INTANGIBILITY

According to Iudícibus (2010), and Schmidt and Santos (2002) the asset correspondent to the controlled by a company, which expect economic benefits in the future.

In the resolution CFC n.º 1.374/11, in the chapter 4, item 4.4 defines asset as a resource controlled by the company because of past events, which awaits that future economic benefits flows for the company. (Conselho Federal de Contabilidade, 2011).

The accounts that compose the Asset, as Marion (2009, p.02) affirms:

“[...] are clustered according with the agility of its conversion on money: according to the degree of liquidity (the capacity of transforming itself on money more quickly):. The definition of the author is in consonance with the art. 178 of the law n.º 6.404/76, in the first paragraph, stablish that the accounts, in the asset, are dispose in order of degree of liquidity, in the following groups: Current Assets and Non-Current Asset (Brasil, 1976).

According to the Resolution CFC n.º 1.185/09, in the item 66, the asset is classified as current when obey one of the following criteria: achievable, or intend to be sold or consumed inside the operational cycle of the company; it is kept with the unique purpose of being negotiated; being performed until twelve months after the balance sheet date; or is the safe or the safe equivalent. All the other assets must be classified as Non-Current (Conselho Federal de Contabilidade, 2009).

The accounts of the Current Asset are the ones that own a greater degree of liquidity, since they cover the accounts that are already money (safes, banks, etc.) and the ones that are going to be converted on money quickly, normally in a period of one year. (Titles to be received, stocks, etc.) (Marion, 2009).

On the other hand, the Non-Current Assets are divided into four groups. Achievable on Long Terms (converted on money in a long term – more than one year), Investments (shares, bills of exchange, etc.), Property (assets such as machines, homes and vehicles, etc.) and Intangible (brands, patents, etc.) (Marion, 2009).

The Resolution CFC n.º 1.185/09, in the item 67 defines that the term “non-current” includes tangible actives, intangibles and financial assets of long term associated nature, i.e. the tangible assets are the physical benefits and within this classification it is included the groups of investments and property, the intangible assets are INTANGIBLE assets, and the financial assets of long-term associated nature correspond to the tangible group of long term (Conselho Federal de Contabilidade, 2009).

According to Antunes (2000, p. 74-75):

Asset, for traditional Accounting, comprehend the assets and rights of the company expressed on coin. In addition, they are classified into tangible assets and intangible assets. In the simple differentiation, the first are the ones that have physical existence and the late are the ones that do not have it.

In addition, as established by the Resolution CFC n.º 1.374/11, in the chapter 4, item 4.11. “Many assets, for example, property items, have physical form. However, the physical form is not essential for the existence of the asset [...]” (Conselho Federal de Contabilidade, 2011).

2.1.1. Tangible Asset

Tangible assets are the ones that since the beginning are measured with accuracy making the decision-making easier for the accountability users. The physical assets that the company owns express them. Tangible Asset or Corporeal, according to Marion (2009, p. 47) “it is constituted of physical assents, materials that can be exchanged by those things that our eyes can see: stocks, vehicles, lands, buildings, machines, office furniture, etc.”

For Iudícibus (2009, p. 203) (the term tangible means, literally, perceptible through the touch”, i.e. capable of being owned of performed, real [...]”, although, the same author highlights that the Accounting treats values and even the assets denominates tangible, sometimes own this physical characteristic in a figurative way.

2.1.2. Intangible asset

The intangible assets were showed in the globalization era, that the knowledge, technology, and all the items considered “invisibles” for its development, started to compose the assets of the company.

According to Iudícibus (2010, p. 264):

“The Intangible are an active as any other. They are clusters of future economic benefits, which a certain company owns the control and exclusivity in its exploration. It happens that differently from the tangible assets that are visibly identified and accounted separated; the intangible sometimes are not [...]”.

The Comitê de Pronunciamento Contábil (2010) in its CPC 04 (R1); that defines the accounting treatment of the intangible assets, establish, in item 8, that the “intangible assets is an identifiable non-monetary asset without physical substance”.

For Schmidt and Santos (2002, p. 14), “the term intangible comes from the latin *tangere* or touch. Thus, the intangible assets are the ones that one cannot touch, because it does not have a physical body”.

According to Marion (2009):

“An intangible Asset must be recognized in the balance sheet, and only if: (a) it is probable that future economic benefits expected to be attributable to the asset flow to the entity; (b) the asset cost could be measured with safety; and (c) it is identifiable and separable, i.e. it could be separated from the company and sold, transferred, licensed, rented or switched, or either individually or together with a contract, related to assets or liabilities”.

Hoss, et al. (2010, p. 2) emphasizes that the term Intangible Assets is “applied to define the value of the company that overcomes the accounting value and that has its fundamental origin in the knowledge”.

Several authors (Hendriksen and Van Breda, 1999; Iudícibus, 2009/2010; Padoveze, 2009; Schimidt et al., 2003; Schimidt and Santos, 2002) highlight that the major types of intangible assets, which emphasize brands and patents, copyright, research and development (R&D), franchises and licenses, among others. It is given emphasis to the Intellectual Capital and Goodwill, that represent today the subgroups of greater complexity, referring to the asset, because they are the most difficult items to be measured (Campani, 2014).

According to Hoss, et al. (2010) these intangible assets, if well managed, can be transformed into sustainable competitive sources for the companies.

2.1.3. Intellectual Capital

According to Stewart (1998, p. XIII) “the intellectual capital consisted in the intellectual matter – knowledge, information, intellectual property, experience – that can be used to create wealth”.

Edvinsson and Malone (1998) emphasizes that other researchers include in their definitions of Intellectual Capital some factors such as employees’ training, technological leadership and fast response to service requests made by customers.

Blinda (2001) addresses that because it is a new concept, the intellectual capital still does not have a defined concept. It represents a set of intangible resources of strategic character that gives competitive advantages in the market.

Therefore, for a Brazilian company to survive in the 21st century, the capacity to think and to network properly with its public, giving it solutions for the existing problems and for the ones that could come, only depends of the ability and competence of the people that work in the company, i.e. the intellectual capital is a real necessity that the companies have to improve themselves. In the moment that the company and its collaborators, with all their knowledge, share the same business dream, they will be able to transform the organization goals in a common will for all the collaborators (Maximiano, 2000).

2.1.4. Goodwill

For Belém and Marques (2012) many authors and accounting professionals always consider the goodwill as intangible, being responsible for the origin of the topic. Iudícibus (2009, p. 207) reinforces this idea of reporting goodwill as “the most intangible element of the intangibles”.

The definition, nature and characteristics of not being separated from the business as a whole, makes that the accounting treatment of the goodwill to be among the goals of the most controversy and difficult accounting studies (Santos et al., 2007, as cited by Belém and Marques, 2012).

2.2. Measurement an assessment of the intangible asset

The measurement of the intangible value, by many reasons, is essential, since this value can support the companies planning and provide information for the administrative to perform analysis for the business improvement, and enable the identification of market opportunities and other strategic issues. It is also highlighted that the value of the intangible asset to be served as main basis for guarantees of loans (Reilly and Schweih, 1999, as cited by Kayo, 2002).

One of the most notable reasons for the assessment of the intangible asset, as affirmed y Keyo, 2002, p. 42), maybe “it is its potential utility for the management and maximization of the business value as a whole”. This author still affirms that from the moment that it is attributed monetary values to these intangibles assets, these could be managed as any other physical asset.

Although, to measure the intangible asset is not easy, once that to measure is to determine a measurement and, in this specific case, it is to try to stablish a value that is the most precise as possible. Therefore, as the intangible assets are the most difficult to measure, to try to solve the question it was elaborated measurement models that seek to measure these assets in the most precise manner.

2.2.1. Models of measurement

These models of measurement are tools created by specialists in the topic that try to evaluate the intangible assets in the most efficient fashion, to thereby obtain a more realistic value of company activities. In the literature there are various models that seek to evaluate, measure and identify the intangible assts. Hereafter, it will be given highlights to those ones that were found in the majority of the studied authors: Skandia Browser, Q of Tobin, Intellectual capital browser, monitor of intangible assets.

According to Holanda, et al. (2007) the use of some of the measurement models of the intangible assets makes it clear that existence of the “occult” values in the organization and that these must be precisely measured. Although, it is essential to verify if the applied model is adapted to the strategic goals of the organization, allowing it to respond favorably to the increasingly frequent changes in the market environment in which it operates.

This idea is reinforced by Machado and Fama (2011) who said that it is common to assume that the intangible assets generate greater economic value to projects, it is worth noting that in each company performing different roles, since they depend on a number of factors, including , the role of industry characteristics and its strategies deployed.

Due to all these factors, for this present study it will be used, as a tool to measure the intangible asset, the degree of intangibility, which is the active participation of the composition of the assets of the company. We chose this indicator, because it is not known for sure how Brazilian companies are showing their intangible and thus avoiding inconsistency to occur.

2.2.2. Degree of Intangibility (GI)

The degree of intangibility (GI) is how intangible assets are influencing the market value of the company. It is calculated by dividing the market value of the company by its shareholders' equity (Belém and Marques, 2012).

Equation 1

$$GI = \frac{\text{Added value of the company}}{\text{Equity capital}}$$

Boeing (2014) reports that the greater the degree of intangibility, the greater the share of intangible assets of companies. This indicator has been used as an analysis tool in several studies (Belém and Marques, 2012; Kayo, 2002; Sponsorship et al., 2007; Perez and Fame, 2006).

For the research we used the debt ratios and profitability, specifically the total debt (END) and the return on equity (ROE), and also the degree of intangibility (GI), since the objective of the work in question is to verify that the companies of BM & FBOVESPA, classified as service providers, who have holdings of intangible assets in its structure, generate higher returns on their total investments.

The use of the total debt is because this index represents the share of debt in the composition of the company, which may enable future benefits to the company, thus influencing the ROE (Belém and Marques, 2012).

3. ENTERPRISE SERVICE PROVIDERS

The world economy went through a period of great changes in recent decades, in which the patterns of production and accumulation were deeply affected by the rapid development of information technology, thus configuring the establishment of so-called Information Society (IBGE, 2009).

These changes resulted in a significant transformation in the internal structure of the companies, which were observed in the stages of production in companies of goods and production, where the technological revolution has brought innovation and greater competitive power. These variations also occurred in companies providing services, whose main mission is to develop their tasks with quality, for both, technological implementation boosted this segment, with the help of these tools now play their services more efficiently (Gonçalves, 1994).

The Brazilian economy grew by 0.9% in 2012 according to data released by the Brazilian Institute of Geography and Statistics (IBGE) on March 1, 2013. The only sector that provided an increase was the service sector, which obtained an increase of 1.7%, while industry and agriculture felt by 0.8% and 2.3%, respectively. The largest variations of the left segments of information services, administration, health and public education (Economy ..., 2013).

Research data of Scenarios 2020, new study of Sebrae-SP (Brazilian Service of Support for Micro and Small Enterprises in São Paulo) showed that in 2015 the service sector is expected to exceed for the first time, trade in number of micro and small companies. The expectation is that there will be about 800,000 micro and small businesses in São Paulo until 2020, a result of growth of 6% per year for the service sector companies, 2.8% for industry and 1.4% for trade (Sebrae-SP, 2012).

The growth of this sector is mainly by the increased demand for the services offered for the needs of the day-to-day that were inserted by technological innovations. Every year there are new technological tools, causing many services to be streamlined while new are being created. This fact makes the companies in this sector to adopt policies that always kept up to date with what the consumer demand (Vasconcelos, 2006).

It is clear, therefore, that the service providers have a unique feature, since they are in a segment where they sell services, or intangible products, and due to this differential, its intangible should represent a significant value, since that to make sales of their services, it needs to have consumer confidence.

Thus, for these companies, the management of its intangible is critical to the success of its economic / financial performance, as consumers seek reliable institutions and with good references for hiring a service. Therefore, the brand, the reputation, the relationship between the company and its customers, as well as the fulfillment of their commitments with them and the quality of services provided, are highly valued items in this segment, that is, those "human" aspects, many time invisible, becomes an important item on creating value for companies to provide services.

A current example of this is the North American telecommunications company Apple, whose reputation and brand is known in most of the world, and has a huge credibility with their customers. In the case of Brazil, and according to the eighty companies providing selected services BMF & BOVESPA, which comprise this present study, we can highlight the phone companies Oi and Tim, the power company Eletrobras and the shipping company Gol air, as some of the companies representing a reputable and recognized brand in the country.

4. DATA COLLECTION

The data collection for the preparation of this work was performed by the Economática® software, which are arranged all companies in the BM & FBOVESPA. Companies that fit as service providers were selected during the period from 2008 to 2012. After the collection of necessary data were developed econometric and statistical tests described in section 5.

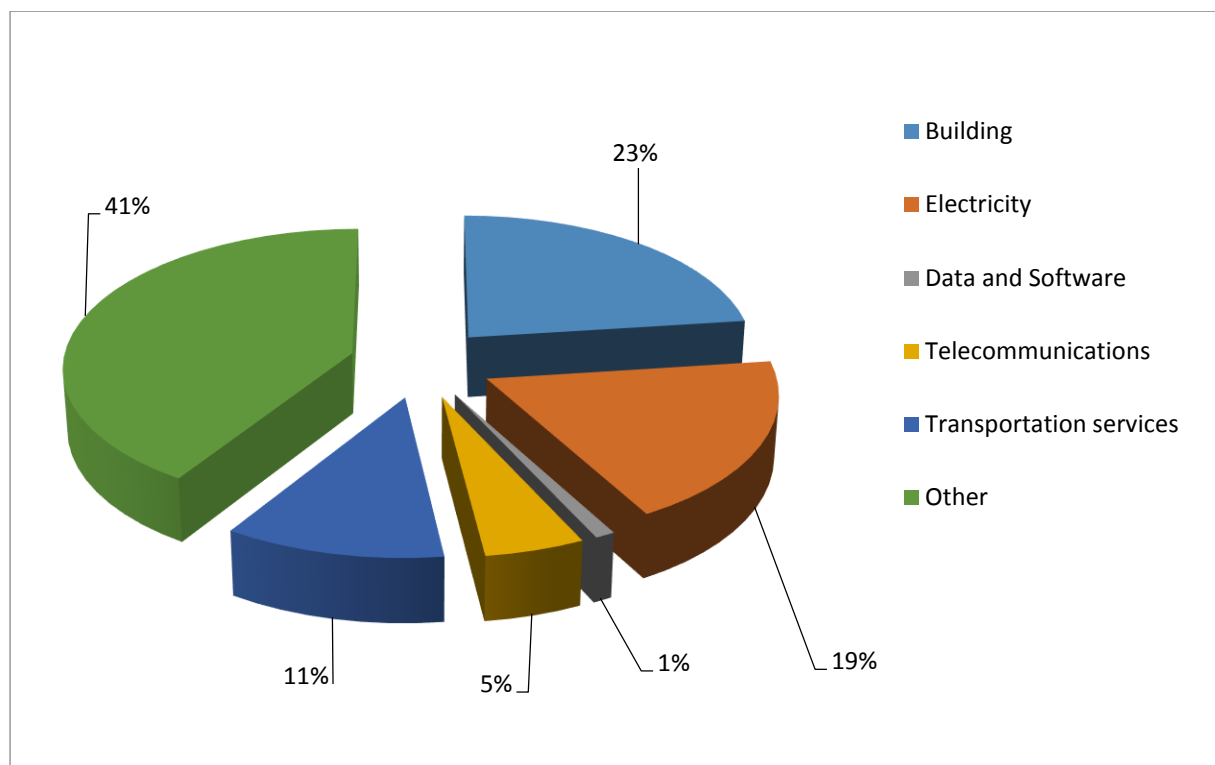
4.1. Sample Characterization

To start the practical part of the work the data were collected from companies of the BM & FBOVESPA that qualified them as service providers, non-financial, that were active in Economática® software and containing all the requested data for the period from 2008 to 2012. Perez and Famá (2006) point out that non-financial firm, i.e. the financial and insurance sector, by having specific characteristics, should be excluded from the sample to not generate possible distortion in the results.

After the first analysis the companies were filtered for that, each company was counted only once, always giving preference for the ordinary actions of the same ones. In the end, there were 80 companies for the composition of

these samples, being 23% from the construction sector, 19% from electric energy, 15% from data software, 5% from telecommunication, 11% from service transport and 41% from other categories such as school, recreation, administration, among others, as illustrated in the Figure 1.

Figure 1: Service providers companies



Source: Elaborated by the authors

The economic and financial data collected were the return on equity capital, total assets, market value, equity capital and debt. By dividing the market value by the shareholders' equity, it was possible to calculate the degree of intangibility of the company (GI), which, as stated Perez and Famá (2006), shows the value that is added by the market to book value of the company.

So that the data could be analyzed, it was used the neperian logarithmic function (LN) to transform the value of total assets in decimal, since the other data are in this format.

For the purposes of data regression model with data on panels, the data were arranged in panels, resulting in 400 data, the first column containing the return on equity of the years 2008 to 2012 and so on for the debt, total assets and the GI.

5. ANALYSIS OF RESULTS

Before the analysis of results, it makes sense to explain the econometrics models that were used.

5.1. Validation of the econometric models

The regression was used with a confidence degree of 95%, therefore, the established significance level for this analysis is 5%, i.e., the items compared with it cannot present superior values to 5% for the regression to be validated (Corrar and Theóphilo, 2007).

Thus, for the results of the regression models with data in the panels to be accepted, it must follow the demands for its validation. One of them refers to the t-statistic, which tests the null hypotheses (H_0) if the angular coefficient (β_i) is equal to zero, against the hypotheses of angular coefficient being different from zero. The null hypotheses will be rejected when the probability of the t-statistic (p-value) obtain the p-value less than 0.05, that in this case, it means that the independent variable exert influence over the dependent variables (Nogueira, 2010).

Another point to be highlighted is the adjusted R-squared value, which according to Corrar and Theóphilo (2007), shows how much the total variation of the dependent variable is explained by the variations of the other variations. The F statistics has as purpose to verify the significance of the regression model as a whole. Therefore, the null hypotheses of this test is $R\text{-squared}=0$, while the alternative hypotheses if $R\text{-squared}>0$. It is analyzed the probability of the F statistic (p-value) when the p-value is less than 0.05, it is rejected the null hypotheses that independent models exert influences over the dependent variable. For the regression models with data on panels, the Wald test is equivalent to the F statistics. Additionally, to verify which model was the best specified it is compared two or more models through the log-likelihood test (Nogueira, 2010).

Besides that, according to Nogueira (2010) the t and F statistics, as well as the Breusch-Pagan test are going to be observed to verify the existence of heteroscedasticity in the regression models, since, according to Corrar and Theóphilo (2007), the existence of the heteroscedasticity comprehends the efficiency of the regression model, what must occurs id the heteroscedasticity, i.e. the residues of samples should be distributed by the straight line regression.

The Breusch-Pagan test is also used in panels to confront the obtained results between the regression methods with the data in the panel with the combined effect with the models with random effects. As well as the F test has the same purpose, even though it confronts the obtained estimates between the regression models with the data on panels with the combined effect with the models with fixed effects (Nogueira, 2010).

On the other hand, to confront the estimates between the regression method in panel with the fixed effects and random effects, for them to not be statistically equals, it is used the model of fixed effects, since that this result shows that the model is consistent, independently of the additional hypotheses of the random effects, on otherwise, the model of random effects is more efficient.

With all the used techniques, Nogueira (2010, p. 84) affirms that:

The adoption of regression models with data on panels offers statistical and econometric support for the scientific research, transmitting a greater credibility to the research, due to its higher methodological precision.

5.2. Econometric models of regression with data on panels

The main econometrics models of regression with data on panels are the econometric models with data on panels with combined effect (Pooled Ordinary Least Squares – POLS), fixed effect and the ones with random effects.

The econometric models of regression with data on panels are based, as every regression, in the linear relation between the independent variable and the dependent variables described in a straight-line equation, as illustrated in the Equation 2 (Corrar and Theóphilo, 2007).

Equation 2

$$Y = \alpha + \beta X + U$$

Where: Y= dependent variable

X= independent or explainable variable;

α = linear or intercept coefficient;

β = angular coefficient;

U = random error and in the population.

The purpose of the analysis of a regression is to obtain the line that best fit the observed data. To obtain the straight line, it is necessary to estimate the α and β , for that, it is used the method of minimum squares, also known as Minium Ordinary Squares (MQO), which considers that the line that better fits to the data is the one that has the smallest difference between the observed and projected values. (Corrar and Theóphilo, 2007).

In the first models, the data on panels with combined effect (POLS) the intercept and all the coefficients do not variate for the companies neither in time, i.e. it stays the same for the whole period (Belém and Marques, 2012).

The general mode for the data on panel with combined effect is represented by the Equation 3, which α and β are always the same for all companies.

Equation 3

$$Y_{it} = \alpha + \beta X_{it} + \varepsilon_{it}$$

The same basic assumptions of the classical linear regression model should be assessed for the use of this model, i.e. the model must present linearity in the regression parameters; normal errors; no correlation of the independent variables with any error; absence of multicollinearity between the independent variables and homoscedasticity (Nogueira, 2010).

According to Corrar and Theóphilo (2007), the presence of linearity ensures that dependent and independent variables are linear, i.e., it ensures that the observed data can be adjusted to a straight line. On the other hand, the existence of normality ensures that the waste has a normal distribution. The multicollinearity should not be present in the variables, because if it occurs, it complicates the separation effect that each variable has on the dependent variable. In addition, the occurrence of homoscedasticity ensures that residues of the sample have a distribution of random and steadily by the regression line.

In the second model, panel data with fixed effects (FE) is assumed that the intercept varies according to the company, but not with time and its slope remains constant for both, independent of time. Equation 4 represents this model (Belém and Marques, 2012).

Equation 4

$$Y_{it} = \alpha_i + \beta_1 X_{it} + \beta_2 X_{it} + \dots + \beta_k X_{kt} + \varepsilon_{it}$$

In the third model, panel data with random effects (EA), according to Belém and Marques (2012), support the same conditions as the panel data with fixed effects, i.e. it also assumes that the intercept varies according to the company, but not with the time, which the slope remains constant for both, time-independent. The difference between the models, as the authors emphasize, is that in the random effects, the intercept is treated as a random variable, which did not occur in the fixed effects, and the value adopted for the equation is the average value of intercept. Equation 5 illustrates this model.

Equation 5

$$Y_{it} = \alpha + \beta_1 X_{it} + \beta_2 X_{it} + \dots + \beta_k X_{kt} + \omega_{it}$$

5.3. Application of the model of regression with data on panel

Using the ROE as dependent variable and the degree of intangibility (GI) and debt (END) as independent variables, it is estimated the regression model by generalized least squares (MQG), with the data already arranged in panel. After this procedure, it was created lagged variables in time, taking into account the independent variables, i.e., the GI and the debt (END). The model was applied again, but now with lagged variables included in both models.

Although the regression model without the addition of lagged variables has obtained a value for the Wald test exceeds the estimated regression model with the presence of lagged variables, the value of the log likelihood test achieved a most significant value in the estimated regression model with the presence of lagged variables in time. Other options of regression models for minimum generalized least squares were tested but the most significant showed to be the one that encompasses all variables and uses the lags due to the high value of the log likelihood test by using more robust estimators was the best tool to validate the model.

With the definition of all data to be used in the regression models with panel data tests, it was designed test to find what the best type of regression model is: the econometric model with panel data with combined effects, fixed effects or random effects.

Firstly, it was estimated the regression model panel data with combined effects, which was significant, since the probability of F, is less than 0.05. As this model proved to be significant, we estimated the regression model with panel data with random effects, which was applied Breusch-Pagan test for the existence of random effects. The test showed the presence of random effects, which can be observed by the chi2 test probability, was less than 0.05.

With the presence of random effects, it was verified if there is presence of fixed effects. Therefore, it was estimated the regression model with data on panel with fixed effects, which found the presence of such effects, because the probability of F was lower than 0.05 and it was proven that the model did not present heteroscedasticity, through a Wald modified test, as developed by Baum (2001).

Because the tests are available both random effects as fixed, we performed the Hausman test comparing the regression models with data in panels, which tested the existence of fixed effects and, if it were not proven, it would be used the model with random effects.

The Hausman test showed that there was presence of fixed effects, so the best-specified model is the data regression model panel with fixed effects (Table 1).

Table 1: Regression model with data on panels with fixed effects

ROE	Coefficient	Standard Deviation	T	Prob. T
Exig/PL	-0,1135354	0,0126519	-8,97	0,000
GI	0,0350541	0,0079983	4,38	0,000
Lag1Exig/PL	0,0536914	0,0149351	3,59	0,000
Lag1GI	-0,0086903	0,0036305	-2,39	0,017
Constant	0,1637341	0,0199659	8,20	0,000
Number of observations = 320				
Number of groups = 80				
F (4,26) = 111,51				
Prob > F = 0,0000				

Source: Stata® v. 12.0.

The variable exig / PL is the debt (END) and Lag1Exig / PL and Lag1GI are the variables lagged in time with respect to debt and the degree of intangibility, respectively.

From the results obtained, it was observed that the T probability obtained value less than 0.05 for all independent variables thereby indicating that all variables had an influence on the dependent variable, i.e. ROE.

It is noteworthy that the results were identical when companies and periods organized the panel data and almost identical when they were organized taking into account only the periods. By having a greater number of evaluated information, it was decided to employ the model organized by companies and periods. Thus, with the results of the regression model with data on panel with fixed effects, it resulted in the following equation:

Equation 6

$$ROE_{it} = \alpha_i + \beta_1 GI_{it} + \beta_2 Debt_{it} + \beta_3 Def.end.it + \beta_4 Def.GI_{it} + \varepsilon_{it}$$

Substituting the data found in Table 1, in the equation 6, it results in the equation (7) of the resulting straight line for this research.

Equation 7

$$ROE_{it} = 0,1637 + 0,035GI_{it} - 0,1135Debt_{it} + 0,0537Def.end.it - 0,0087Def.GI_{it}$$

With this result it can be noticed that for every 1 unit of GI the ROE increased 0.035, i.e. the higher the GI, the higher the ROE. As for the debt, for every 1 unit of this index, the ROE decreased 0.1135, which established a negative relationship between them, since the higher the debt capital, the lower the return on equity.

By analyzing the variables lagged in time, it was found that for the debt this gap was positive, indicating that from 2008 to 2012 these companies decreased the participation of debt in its structure. In relation to the GI, its lag in time was negative, which implies that for the analyzed period, the share of intangible assets in equity of the company was decreasing over time.

The goal of this study was to determine the influence of the participation of intangible assets in the composition of the structure of service providers, from 2008 to 2012, compared to the return on their investments. Through the equation that was found, it was verified that the higher the GI, the greater the ROE, i.e. what is proposed in this research was confirmed. Although this does not apply the lagged variable in the GI time, but to know the reasons why this occurs, further studies should be performed. Thus, one can see that this issue will still be cause for future research and many discussions.

6. CONCLUSION

This study had as a goal to verify if the generation of value of the company, through the return on equity, is related with the degree of intangibility of the companies of BM&FBOVESPA classified as service providers from 2008

to 2012. Several studies pointed that the complexity to measure the intangible asset could make these assets to not properly reflect in the financial statements.

During this research the degree of intangibility, which represents the share of intangible assets in relation to its equity, i.e. it indicates the percentage corresponding to the difference between the market value and the accounting in relation to the assets of the company, proved to be the best possible measurement of this intangible asset, since the other models are complex and may have significant variations depending on the company's sector.

The data of the service providers were collected through software database system Economática® and organized on a panel to perform more accurate statistical and econometric tests that were developed with the application of Stata® software v. 12 for the completion of the goal of this research.

The results that were found through the performed tests proved that there is a relation between the degree of intangibility and the return over the total investments. Therefore, for the analyzed service providers companies from 2008 to 2012, the results support the elaborated hypotheses in this research that the degree of intangibility influences in a positive manner the return over the investments, i.e. the bigger the intangibility, the bigger is the return of the company.

Even by achieving positive results for this study, the intangible assets subject will still be studied by several study and many discussions because of its vagueness and the difficulty of its measurement. And as these assets tend to be increasingly present in the companies, it should be paid attention to these invisible characteristics that with the era of information and knowledge are in expansion and represent part of information that is useful for decision making.

REFERENCES

- ANDRADE, M. M. de.(2002). *Como preparar trabalhos para cursos de pós-graduação: noções práticas*. 5. ed. São Paulo: Atlas.
- ANTUNES, M. T. P. (2000). *Capital intelectual*. São Paulo: Atlas.
- BAUM, C. F. (2001). *Residual diagnostics for cross-section time series regression models*. Stata Journal. v. 1, n. 1, p. 101-104.
- BELÉM, V. C.; MARQUES, M. de M. (2012). *A influência dos ativos intangíveis na rentabilidade do patrimônio líquido das empresas brasileiras*. 12º Congresso USP de Controladoria e Contabilidade. São Paulo, SP, 26/27 jul. Retrieved from: <www.congressousp.fipecafi.org>. Accessed 6 mar. 2013.
- BEUREN, I. M. (2009). *Como elaborar trabalhos monográficos em Contabilidade: teoria e prática*. 3. ed. atual. São Paulo: Atlas.
- BINDA, N. U. (2011). *Capital intelectual e innovación: una sinergia necesaria*. *Ciencias Económicas*. n. 29, p. 463-474, fev.
- BOEING, R. (2014). *You want piece of them? A study concerning the contribution of celebrity endorsement to economic, financial, market values and stock prices*. *Asian Journal of Business and Management Sciences*, Vol. 3 No. 04 [01-18] may.
- BRASIL. Lei n. 6.404, de 15 de dezembro de 1976. **Dispõe sobre as Sociedades por Ações**. República Federativa do Brasil, Brasília, DF, 15 dez. 1976. Retrieved from: <http://www.planalto.gov.br/ccivil_03/Leis/L6404compilada.htm>. Accessed: 4 mar. 2013.
- BRASIL. Lei n. 11.638, de 28 de dezembro de 2007. **Altera e revoga dispositivos da Lei nº6.404, de 15 de dezembro de 1976, e da Lei nº6.385, de 7 de dezembro de 1976, e estende às sociedades de grande porte disposições relativas à elaboração e divulgação de demonstrações financeiras**. República Federativa do Brasil, Brasília, DF, 28 dez. 2007. Retrieved from: <http://www.planalto.gov.br/ccivil_03/_Ato2007-2010/2007/Lei/L11638.htm#art1>. Accessed: 4 mar. 2013.
- CAMPANI, C. H. (2014) *On the Rate of Return and Valuation of Non-Conventional Projects*. *Business and Management Review*, Vol. 3(12) pp. 01 – 06 October.
- COMITÊ DE PRONUNCIAMENTO CONTÁBIL (2010). *Pronunciamento técnico CPC 04(R1) - Ativo intangível*. Brasília: [s.n]. Retrieved from: <<http://www.cpc.org.br/mostraOrientacao.php?id=18>>. Accessed: 4 mar. 2013.
- CONSELHO FEDERAL DE CONTABILIDADE (2009). *Resolução CFC n. 1.185/09. Aprova a NBC TG 26 – Apresentação das demonstrações contábeis*. Brasília. 28 ago. Retrieved from: <http://www.crcsp.org.br/portal_novo/legislacao_contabil/normas/index.htm>. Accessed: 28 abr. 2013.
- CONSELHO FEDERAL DE CONTABILIDADE (2011). Resolução CFC n. 1.374/11. *Da nova redação à NBC TG Estrutura conceitual – Estrutura conceitual para elaboração e divulgação de relatório contábil-financeiro*. Brasília. 8 dez. Retrieved from: <http://www.crcsp.org.br/portal_novo/legislacao_contabil/normas/index.htm>. Accessed: 28 abr. 2013.

- CORRAR, L. J.; THEÓFILO, C. R.; (2007). *Pesquisa operacional para decisão em contabilidade e administração: contabilometria*. 3. reimp. São Paulo: Atlas, 2007.
- EBRATI, M. R., EMADI, F., BALASANG, R. S., and SAFARI, G. (2013). *Impact of Capital Structure on Firm Performance: Evidence from Tehran Stock Exchange*. Australian Journal of Basic and Applied Sciences, 7(4): 1-8.
- ECONOMIA brasileira cresceu 0,9% em 2012**, diz IBGE. **G1 Economia**, São Paulo, mar. 2013. Retrieved from: <http://g1.globo.com/economia/noticia/2013/03/economia-brasileira-cresce-09-em-2012-diz-ibge.html>. Accessed: 9 set. 2013.
- EDVINSSON, L.; MALONE, M. S. (1998). *Capital intelectual: descobrindo o valor real de sua empresa pela identificação de seus valores internos*. São Paulo: Makron Books.
- GIL, A. C. (1999). *Métodos e técnicas de pesquisa social*. 5 ed. São Paulo: Atlas.
- GONÇALVES, J. E. L. (1994) *Os impactos das novas tecnologias nas empresas prestadoras de serviços*. **Revista de Administração de empresas**. São Paulo. p. 63-81. jan./fev. Retrieved from: http://www.scielo.br/scielo.php?pid=S0034-75901994000100008&script=sci_abstract. Accessed: 9 set. 2013.
- HENDRIKSEN, E. S.; VAN BREDA, M. F. (1999). *Teoria da Contabilidade*. Tradução Antonio Zoratto Sanvicente. 5. ed. São Paulo: Atlas, 1999.
- HOLANDA, L. M. C.; SILVA FILHO, J. F.; ROCHA, R. C. (2007) *Capital intelectual: um estudo de caso numa empresa de jornalismo*. **GEPROS**. a. 2, vol. 2, p. 73-88, jan./abr. Retrieved from: <http://revista.feb.unesp.br/index.php/gepros/article/view/134/96>. Accessed: 27 jun. 2013.
- HOSS, O.; ROJO, C. A.; GRAPEGGIA, M. (2010). *Gestão de ativos intangíveis: da mensuração à competitividade por cenários*. São Paulo: Atlas.
- IBGE – Instituto Brasileiro de Geografia e Estatística. *O setor de tecnologia da informação e comunicação no Brasil: 2003-2006*. Ministério do Planejamento, Orçamento e Gestão. Rio de Janeiro, 2009. Retrieved from: <http://www.ibge.gov.br/home/estatistica/economia/stic/publicacao.pdf>. Accessed: 27 maio 2013.
- IUDÍCIBUS, S. de. (2009). *Teoria da Contabilidade*. 9. ed. São Paulo: Atlas.
- IUDÍCIBUS, S. de. (2010). *Manual de Contabilidade societária: aplicável a todas as sociedades de acordo com as normas internacionais e do CPC*. São Paulo: Atlas.
- KAYO, E. K. (2002). *A estrutura de capital e o risco das empresas tangível e intangível-intensivas: uma contribuição ao estudo da valoração de empresas*. Tese (Doutorado em Contabilidade) – Faculdade de Economia, Administração e Contabilidade da Universidade de São Paulo. Retrieved from: http://www.teses.usp.br/teses/disponiveis/12/12139/tde-05032003-194338_pt-br.php. Accessed: 9 out. 2013.
- LIMA, E. S. de. (2010). *Mensuração do capital intelectual*. UFRGS. Porto Alegre. Retrieved from: <http://www.lume.ufrgs.br/bitstream/handle/10183/27246/000763376.pdf?sequence=1>. Accessed: 22 jun. 2012.
- MACHADO, J. H.; FAMÁ, R. (2011). *Ativos intangíveis e governança corporativa no mercado de capitais brasileiro*. 11º Congresso USP de Controladoria e Contabilidade. São Paulo, SP, 28/29 jul. 2011. Retrieved from: www.congressosp.fipecafi.org. Accessed: 6 mar. 2013.
- MARION, J. C. (2009). *Contabilidade Empresarial*. 15. ed. São Paulo: Atlas.
- MAXIMIANO, A. L. (2000). *Capital intelectual: um ativo decisivo, muito falado e pouco utilizado*. **Exame**. 706. ed. São Paulo: Abril. Retrieved from: <http://exame.abril.com.br/revista-exame/edicoes/0706/noticias/capital-intelectual-m0048457>. Accessed: 13 maio 2013.
- NOGUEIRA, I. V. (2010). *Investimento em empresas brasileiras de capital aberto: um estudo da variável q de Tobin, como medida de avaliação das oportunidades de investimento pós-plano real*. Dissertação (Mestrado em Administração) – Centro de Pós-Graduação e Pesquisas em Administração da Universidade Federal de Minas Gerais: Belo Horizonte, Retrieved from: http://cepead.face.ufmg.br/index.php?option=com_wrapper&view=wrapper&Itemid=209. Accessed: 9 out. 2013.
- PADOVEZE, C. L. (2009). *Manual de Contabilidade básica: contabilidade introdutória e intermediária*. 7. ed. São Paulo: Atlas.
- PATROCÍNIO, M. R.; KAYO, E. K.; KIMURA, H. (2007). *Aquisição de empresas, intangibilidade e criação de valor: um estudo de evento*. **R.Adm.**, São Paulo. v. 42, n. 2, p. 205-215, abr./maio/jun. 2007. Retrieved from: <http://www.scielo.br/pdf/rcf/v17n40/v17n40a02.pdf> <http://www.rausp.usp.br/busca/artigo.asp?numero=1226>. Accessed: 16 set. 2013.

- PEREZ, M. M.; FAMÁ, R. (2012). *Ativos intangíveis e o desempenho empresarial*. **Revista Contabilidade & Finanças – USP**, São Paulo. n. 40, p. 7-24, jan./abr. 2006. Retrieved from: <http://www.scielo.br/pdf/rcf/v17n40/v17n40a02.pdf>. Accessed: 17 jun. 2012.
- SCHMIDT, P.; SANTOS, J. L. dos. (2002). *Avaliação de ativos intangíveis*. São Paulo: Atlas.
- SCHMIDT, P.; SANTOS, J. L.; GOMES, J. M. M (2003). *Contabilidade intermediária: atualizada pela minirreforma tributária Lei nº10.637/02*. São Paulo: Atlas.
- SEBRAE-SP – Serviço Brasileiro de Apoio às Micro e Pequenas Empresas de São Paulo (2013). **Empresas de serviços serão a maioria no mercado paulista em 2020**. São Paulo, Retrieved from: <http://www.sebraesp.com.br/index.php/component/content/article/23-noticias/comercio-e-servicos/1264-empresas-de-servicos-serao-a-maioria-no-mercado-paulista-em-2020>. Accessed: 09 set. 2013.
- SEVERINO, A. J. (2007). *Metodologia do trabalho científico*. 23. ed. rev. e atual. São Paulo: Cortez, 2007.
- STEWART, T. A. (1998). *Capital intelectual: a nova vantagem competitiva das empresas*. Tradução Ana Beatriz Rodrigues e Priscila Martins Celeste. 9. ed. Rio de Janeiro: Campus, 1998.
- VASCONCELOS, L. (2006) *Serviços: um setor em ebulição*. **Revista desafios do desenvolvimento – IPEA**. Retrieved from: http://www.ipea.gov.br/desafios/index.php?option=com_content&view=article&id=1127:reportagensmaterias&Itemid=39. Accessed: 24 set. 2013.