International Journal of Management, Accounting and Economics
Vol. 4, No. 5, May, 2017
ISSN 2383-2126 (Online)

www.ijmae.com

Accounting Information and Stock Returns: Evidences from Brazil

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Abstract

In this work it was proposed to explore the relation between accounting information of Brazilian corporations and the return of their stocks. The approaches explored was the informational content and the semi-strong form of market efficiency as presented by (Fama, 1970). The sample contemplated data of 211 companies listed on BM&FBOVESPA. The accounting variables used was current liquidity, earnings per share and book value per share, and the period selected was between the second quarter of 2005 and the fourth quarter of 2015. The empirical strategy chosen was to perform econometric tests in a panel data structure, and collate results with a vector autoregressive analysis and temporal precedence tests. Besides the empirical approach, it was presented the characteristics of Capital Markets-Based Accounting Research and the state of arts of this branch in Brazil. Results had pointed to the validity of the semi-strong form of market efficiency. However, the totally disconnection between variables may characterize a capital market that agents had no confidence in the financial information provided by companies, once was evidenced that variables had no informational content. It may reflect the way Brazilian capital market is organized, with the existence of country-factors as bank-oriented funding system, continental model and the tendency of accounting of being taxes-oriented as brought by (Ali & Hwang, 2000).

Keywords: Accounting information, Capital market, Market efficiency, Informational Content.

Cite this article: de Andrade, L. L., & dos Santos, N. S. (2017). Accounting Information and Stock Returns: Evidences from Brazil. *International Journal of Management, Accounting and Economics, 4*(5), 443-485.

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Introduction

The role of financial information in capital markets has been explored worldwide since the seminal papers of Ball and Brown (1968) and Beaver (1968), especially in countries with established capital markets. In Brazil, however, this question is underexplored and there is still need of evidences that explain the relation between accounting variables and capital market. Works that have analyzed this relation had not arrived in similar results, and it may be impossible to compare them, because Brazilian market structure went through many changes in the past decades, and different periods and samples may reflect different data generating processes.

The research in this area is built around two main theoretical frameworks for interpreting the relation between accounting and stock market. One of them explores the informational content and try to predict prices through a fundamentalist model while the other one stands on the theory of market efficiency. The works on information content have tried to measure the relation between financial information from companies and their stock prices by applying a linear regression models for a cross-section analysis and, on the other hand, market efficiency studies usually apply vector auto-regressive techniques to a time-series of multiple variables.

This paper aimed to analyze the relation between accounting variables and capital market by measuring their power to explain stock returns and identifying precedence in the variables and returns. We propose to analyze the relation of returns with financial information by using the panel data structure. The advantage of using the panel data methodology is the alternative of having data over time for the same cross section element, giving to the analysis a dynamic view. To collate with panel data results, it was estimate a set of Vector Autoregressive, and to explore the precedence issue, it was performed a set of Granger Causality test. Therefore, it might be said try to explore both approaches: informational content and market efficiency.

The period analyzed was from 2005 to 2015 and the accounting variables chosen were current liquidity, earnings per share and book value per share. Current liquidity was chosen because is a measure that reflects directly the capability and intentions of a company's governance. It can be interpreted by investors as a short-term risk appetite ratio. Current liquidity is defined by the ratio of current assets and current liabilities. Earnings and book values had been plenty explored in previous works since (Feltham & Ohlson, 1995) model, and had presented ambiguous results, so it was decided to explore this relation.

This article is organized in 6 sections beyond this introduction. Section 2 is a brief presentation of the structure of Brazilian capital market; Section 3 a theoretical framework presenting the accounting based capital market research; Section 4 contextualize what Brazilian economy had passed in the period analyzed and how the impact in the capital market; Section 5 presented data and methods; Section 6 is the results of the analysis and had a discussion contextualized in the literature; Section 7 concludes the article.

The institutional structure of Brazilian capital market

Brazilian financial system is regulated by Law 4.595/64 (Brasil, 1964), Law 6.385/76 (Brasil, 1976a) and Law 6.404/76 (Brasil, 1976b). The first law organizes Brazilian monetary system by creating National Monetary Council (CMN) and Central Bank of Brazil (BCB), which is responsible for making policies for monetary system and capital markets and executing them, respectively. Law 6385/1976 creates Securities and Exchange Commission of Brazil (CVM) which is in charge for day to day supervision of capital markets. Law 6404/1976 defines corporation, rules them and how their shares are traded in stock markets. Actually, there is only one stock exchange in Brazil which is BM&FBOVESPA, making it simple to understand the organization of stock markets in Brazil.

Companies listed at BM&FBOVESPA have three segments of Corporate Governance Standards: New Market, Level 2 and Level 1. Concerning financial information, the rules are the same for all levels. Brazilian open companies listed in the BM&FBOVESPA were recommended by CVM to use the IFRS international standards of accounting reports since 2001, the mandatory came in 2007 through the Law 11.638/07 (Brasil, 2007).

Theoretical framework

Accounting information and capital market

It is widespread in the financial world that financial disclosures are important to investors to make decisions. The role of accountability, among others, is to precisely transmit informational content about firms to the market. The Capital Markets-Based Accounting Research, which studies the relation between accounting variables and capital market, has its start point with (Beaver, 1968) and (Ball & Brown, 1968). The first examines the investor's perception of the earnings information content. The latter one was an empirical study that aimed to test if market immediately reflects the information available, that is, test market efficiency, which means there is no room for speculation. However, the evidence they found was a positive association between price and the explanatory variable earnings per share. The statistical evidence that accounting data has informational value to change investor expectation stimulates many later studies; (Kothari, 2001) identified more than a thousand publications in this area only in the United States.

(Beaver, 2002) has brought up five areas that have most contribute to the capital market research. These areas were organized by the author in two main groups: theoretical framework and applications. As theoretical framework, he cites two branches of research that are concerned about the role of accounting information in the capital market: market efficiency and the Feltham-Ohlson modeling. The former branch of research was developed by (Fama, 1970). The market efficiency hypothesis says it is expected prices provide accurate signals for resource allocation in capital market. In other words, the market should be a place where firms can take decisions about their production and investments, and investors can choose securities that really represent their risk appetite and their communication channel is the price. This is only possible when prices fully

reflect all information of the firm's health and governance. The importance of the theory is so well known that the role of most of the regulation in accounting is premised on the notion of market efficiency.

(Fama, 1970) divides empirical works concerned with testing the efficiency of markets in three categories: (i) the weak form tests, in which the only set of information considered are the historical of prices; (ii) the semi-strong form that tests whether prices adjust to the information set available to the market players, such as financial information's published by the firms, and (iii) the strong form tests, in which the concern is whether all information, public or not, are reflected in prices.

Although nonexistence of friction costs might be sufficient for defining efficient markets it isn't a necessary condition for sure. Despite the existence of costs, when transactions are able to perform, so then prices will fully reflect all available information. At the same time, it is enough that a sufficient number of market agents have access to available information and that none of them has a superior evaluation method. But, even with the relaxing of assumptions concerning the nonexistence of friction costs, this market is already something hard to find in practice. As a consequence, (Fama, 1970) states that a challenge of empirical works is to measure exactly the grade of market failures.

Studies that analyze the effects of accounting information in security prices are concerned with the semi-strong form of efficient markets. This hypothesis postulates that prices are a glimmer of the information obviously available to the public. However, many models could be formulated in this sense. Different tests contemplating different models should be brought to the scrutiny of the empirical evidence, and thus achieve some establishment and reputation (Fama, 1970). According to (Haugen, 2001), once the semi-strong form of efficient markets is confirmed, there is not any kind of fundamental analysis, based on available information, capable of foreseeing abnormal returns. Then, the expected return to securities should be at the same level of the risk-free asset plus the associated risk-price (Campos, Lamounier, & Bressan, 2012).

The second branch of research brought by Beaver (2002) in the theoretical field is the Feltham-Ohlson model, as developed in (Ohlson, 1995, 1999) and (Feltham & Ohlson, 1995, 1996). Assuming that the security value equals the present value of expected dividend (following the theoretical foundation provided by (Rubinstein, 1976)), the approach proposes that accounting information as earnings and book value are the basis for calculating the value of equity. This is possible because of the clean surplus relation, where dividends affect the book value – and not the result – of the same period. The value of equity becomes a function of book value and the present value of abnormal earnings. (Beaver, 2002) states the Feltham-Ohlson model motivates a handful of empirical studies that combines the book value and earnings approach.

(Ohlson, 2005) reformulate his work, replacing the book value with the earning expected in the next period. According to (Ohlson, 2005), the called Abnormal Earnings Growth Model, or AEG Model, brought some advantages. The benefit of using AEG model is that this one has more flexible assumptions: AEG doesn't need book value or the clean surplus relation assumption.

The second group granted by Beaver is the one concerned with application affairs. It was cited three branches of empirical studies: value-relevance, analyst's behavior, and discretionary behavior. Once more financial disclosures are present by representing a great use in the value-relevance field of study.

Value-relevance studies had their boom in the 90's. It is a major empirical field that examines the relation between a security price or price variation, as the dependent variable, and a selection of accounting variables (or external variables, as macroeconomic ones) as explanatory variables. (Beaver, 2002) states value-relevance can be measured through statistical analysis of the explanatory power of the accounting variable. The researches can be divided in those concerned in the timeliness of the public disclosure by measuring the price change through event studies. In contrast, there are level studies that "identify drivers of value that may be reflected in price over a longer time period […]".

It is important to bring it up that value-relevance it is not a homogeneous research area. (Francis & Schipper, 1999) listed four approaches of possible interpretation of the value-relevance term. The first interpretation assumes that accounting variable can express the intrinsical value of security because it reflects, better than prices, all available information. This approach is related with the inefficiency of markets hypothesis where it is possible to profit abnormally by using an accounting-based analysis. The second interpretation states financial information is value-relevant when it works as a prediction instrument for other variables of the model, as future dividends or future cash flows. The third approach is the one that states an accounting variable is relevant whenever investors consider it in pricing in a sort of self-fulfilling process. In other words, the information is relevant when it changes market's expectations. The fourth and last interpretation argues the relevance of accounting information in aggregating the many transactions of a firm in "few numbers", having significance (or relevance) per se. Although those numbers may not reflect in prices if investors have access to more up-to-date information, prices and accounting information shall be bind to each other.

(Lo & Lys, 2000) propose three approaches to clarify the value relevance studies and their objectives. They divide the area in informational content, valuation relevance and value relevance. Information content studies, just as (Beaver, 1968), are interested whether the information is detected or not by the market, not been interested in identifying the "direction" of information. Valuation relevance studies are based on the (Ball & Brown, 1968) experiment, they try to identify the relation through the time between market value and information. Value relevance, in turn, also analyzes the relation between market value and information disclosures, but this branch is more interested in its quantification instead.

The value-relevance of earnings and others accounting variables were widely explored in the developed world in the last fifty years. Meanwhile, it prevails the idea that emerging markets are less efficient in the matter of the relevance of accounting information to capital markets (Burgstahler & Dichev, 1997). (Akerlof, 1995) affirmed that "Dishonesty in business is a serious problem in undeveloped countries […]" and it reflects the belief of agents in the quality of the information available to decision making.

(Ali & Hwang, 2000) surpassed the dichotomy between developed and emerging markets and went deeper by exploring the factors that influence the explanatory power of accounting variables (earnings and book value) for security returns. They selected five country-specific factors, features of the accounting system and national capital market, which reduce the value-relevance of them:

a) Bank-oriented (opposed to market-oriented): few banks supply most of capital needs and they have direct access to company information. In this arrangement, the demand for good quality reporting publications is lower;

b) Government standard setting: when countries established financial accounting rules with the primary purpose of satisfying governmental policies of taxation or macroeconomics plans, instead of taking an international standard aiming the transparency for efficiency of the markets, for example;

c) Continental model (over British- American model);

d) Tax rules influence significantly financial accounting measurements;

e) Lower spending on external auditing.

(Lopes, de Sant'Anna, & da Costa, 2007) affirm that Brazilian accounting system and capital market carries almost every country-specific factor listed by Ali and Hwang, reducing the pertinence of disclosure numbers. Additionally, macroeconomic factors have a big influence on the returns in the security market, well above the specific firm informational content, as affirmed (Morck, Yeung, & Yu, 2000).

Evidences from Brazilian market

Studies concerning the relation between accounting information and the capital market had advanced in Brazil regardless the obstacles pointed by (Morck et al., 2000) and (Ali & Hwang, 2000). It was carried out a survey of some studies conducted in order to explore the relation between financial disclosures and stock prices; it was found eighteen studies between the period 1990 and 2015. The full list can be found in Appendix 1.

The most explored financial variable was earnings, which is present in 83% of studies listed. The area of interest showed to be the timeliness of the information absorption by the market measured by event study. It is an important methodology to analyze the semi-strong form of market efficiency. The results of these studies have not led to a common conclusion, bringing the necessity of persisting in this area.

(Leite & Sanvicente, 1990) had proposed to discuss the use of book value per share in the investment decision. They implemented an event study with daily data of 43 shares listed on BMF&BOVESPA. The period analyzed was the first four months of 1989, so it was analyzed just one disclosure event. They not found significant informational content in book value and pointed that it shall be caused by the anticipation of financial disclosures by market participants.

The next study in the timeline is (Scbiehll, 1996). This work investigated how financial disclosures influenced the pricing process of shares of 90 companies in the period between January 1989 and April 1995. The author selected the variable earnings aligned with (Ball & Brown, 1968) study. It was identified that earnings announcements are relevant to the market, once it has an influence upon prices. Schiehl concludes that Brazil has an efficient capital market under the semi-strong hypothesis. Other studies had explored the relevance of earnings, as (Bruni & Famá, 1998) and (Terra & Lima, 2006), which did not found significant relevance in the variable; and (Martinez, 2004) that did found.

(Paulo, Sarlo Neto, & Santos, 2013) followed the same approach by testing how earning disclosures affects prices through the days, using event study. The sample was composed of daily information of 75 companies between July 1999 and March 2008. It was found that market reacts only to "bad news", revealing an asymmetric informational content. This result was corroborated by (dos Santos & Lustosa, 2015), which analyzed the earnings informational content in the revenue and expenses perspective, and found that market is sensitive to negative variations of expenses and revenues however, positive variations are not statistically relevant.

(Campos et al., 2012) verified the relationship between market return and return on equity for 75 companies between 1995 and 2010 by using Granger causality. It was identified bicausality between variables and it was concluded that market is inefficient concerning the analyzed sample. (Brugni, Fávero, da Silva Flores, & Beiruth, 2015) also tested the Granger causality, but for earnings and prices. It was not found a homogeny result: in some cases, earnings preceded prices and in others prices anticipate the announcing. They concluded there was efficiency in the medium and long-term, but there was room for speculation in the short-term.

(Lima, 2010) investigated the relevance of accounting information before and after this convergence. It was implemented an event study and timeliness to test if earnings and book value had changed their informational content through the time. From event study it was identified that variables had informational content, saving that it has not changed with the standard adoption. However, the timeliness has pointed a positive effect on the adoption of IFRS. (Ramos & Lustosa, 2013) also verified if the adoption of international standards affected the value-relevance of financial statements and found an increasing in the explanatory power of the variables earnings and book value by embrace the IFRS.

The Brazilian Economy in the Period of Analyzes

It is expected that the capital market interacts with the economics of the country, reflecting changes in macroeconomic policies, crises, and even climate issues. The Brazilian economy was very volatile concerning its economic growth in the decade between 2005 and 2015. It has passed through the subprime financial crisis in 2007/2008 when it had a negative GDP rate (-0.3%). However, it had a very good moment right after the crises, when it reaches a GDP of 7.5%. Figure 1 represents the Brazilian GDP variation in the period.

The fluctuations in the economic growth affected the capital market in a not too predictable way. The 2007 international financial crisis has a very deep impact in the index IBOV, as is shown in Figure 2. This effect occurs due to the lack of confidence from international investors; Brazil is still quite susceptive to capital outflows in times of crises, following a feature of capital markets in developing countries according to (Santacreu & Lins, 2008). In the other hand, the 2015 local economic crisis seemed to be better managed by investors. It can be caused by the changes in the Brazilian investment grade: Standard & Poor's granted to Brazil an investment grade in April of 2008 and it was followed by Fitch Rating, which conceded the investment grade in October of the same year. This trend was succeeded by Moody's, in September of 2009. The change in the risk of the investment in the country was an important factor to the stock market recovery after the subprime event.

Figure 1 Quarterly variation Brazilian GDP (Data source: IPEADATA - Oct/2016

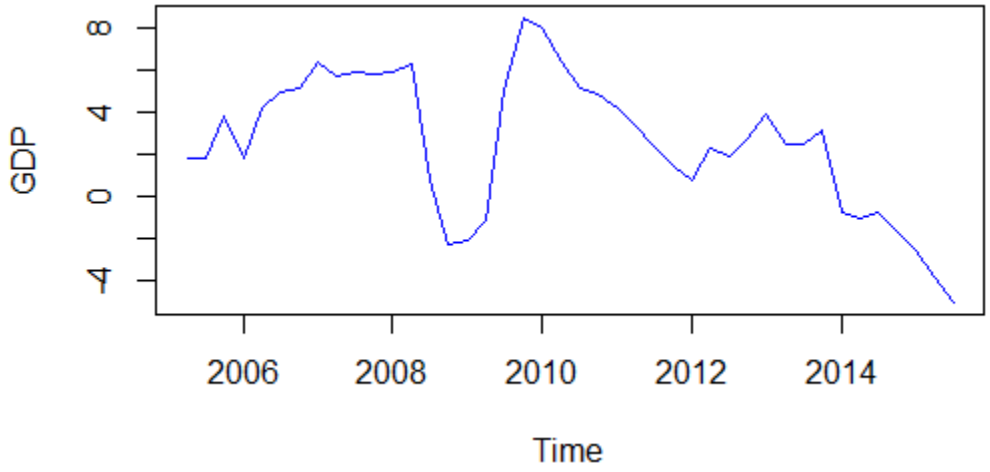
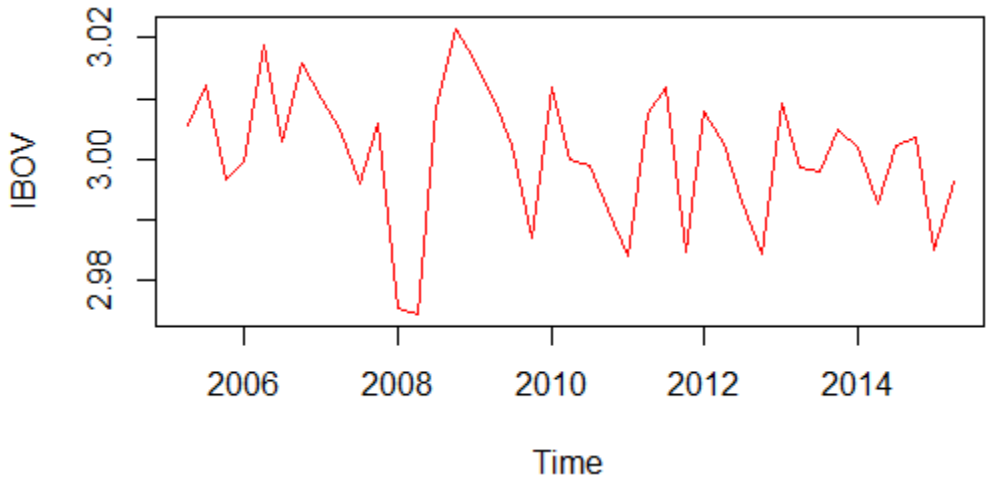
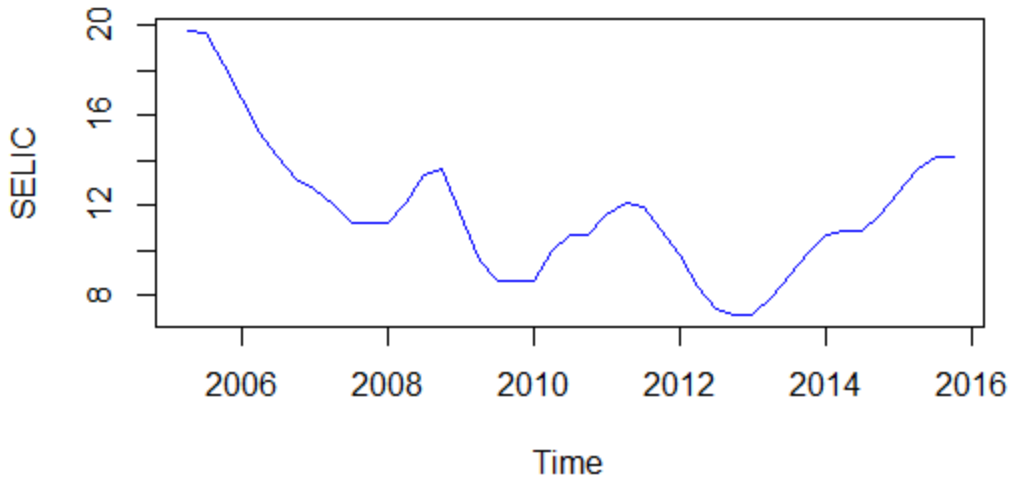


Figure 2 Return- A of IBOVESPA index - Data source: Economatica (Oct/2016)



The interest rate is a reference to Brazilian capital market and it is directly linked to market confidence. This fact reflects Brazilian history with hyperinflation, once the basic interest rate is an important monetary policy instrument to control price levels. At the same time, high interest rates make government treasuries more attractive to the investor, competing directly with investments in stocks. The average interest rate in the period reaches 11.89 % per year.

Figure 3 Brazilian basic Interest rate (SELIC) – 12 months accumulation – Data source: BCB – Time Series Management System (Oct/2016)



Data and methods

Data was collected on July 05th, 2016 from Economática System at UFRGS School of Management. It was selected all stocks traded in BM&FBOVESPA between the period January 1st, 2005 and December 31st, 2015. The sample contemplated 287 distinct stocks (not necessarily from different companies).

It was collected the following information to each stock from the sample (the information is non-consolidated by economic group):

- Price at the quarterly closing, adjusted for inflation;
- Earnings per share, adjusted for inflation;
- Current Liquidity;
- Book value per share, adjusted for inflation.

Hereafter the variables will be respectively called as *Price*, *EPS*, *Liq*, and *BVPS*. Observations had a quarterly frequency, resulting in 44 periods.

Shares with more than 5% of missing values in some of the variables (pair stock/variable time series) were excluded from the sample. It was 73 cases or 25.4% of the total sample. Series with missing data representing less than 5% was accepted and the

missing values were replaced by the value of the preceding period. These adjusts were arranged using Microsoft Excel 2010. It was recognized that using survival and liquidity criteria to define the sample brings some selection bias; this issue was put aside in this work.

The return of the share defined as follow

$$Ret_t = \ln\left(\frac{Price_t}{Price_{t-1}}\right) \quad (1)$$

Other variables were used in their raw form. The number of observations was reduced by 1 when the *Ret* was calculated, lasting 43 observations by pair variable/share.

The figures 4, 5, 6 and 7 are representing the variables in an aggregated view, by using the average of all cross-sections into the same period of time. All data manipulations were made by using R Statistic version 3.2.4 in the Windows 7 operational system.

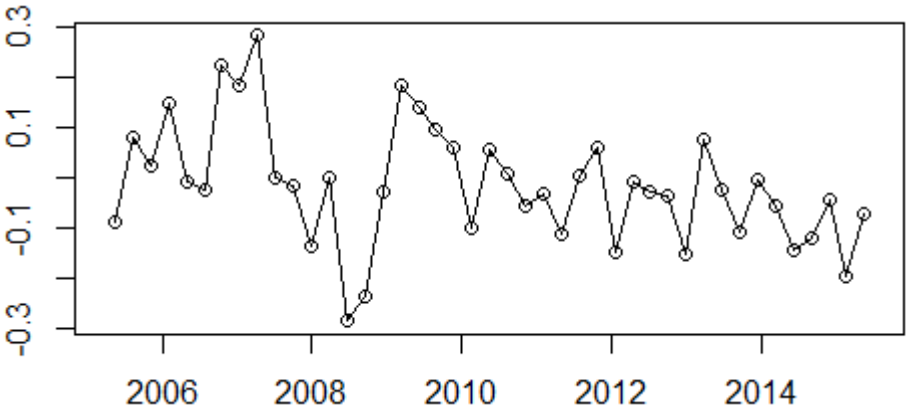


Figure 4 Return - Average by time

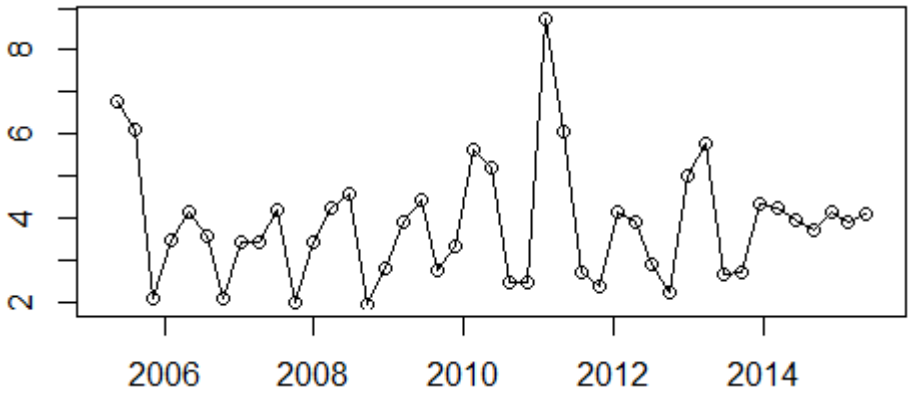


Figure 5 Liquidity- Average by time

Figure 6 *EPS*- Average by time

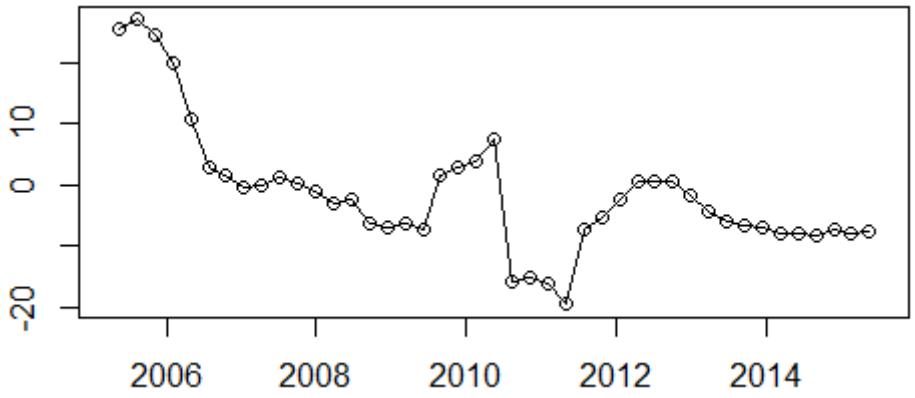


Figure 6 *EPS*- Average by time

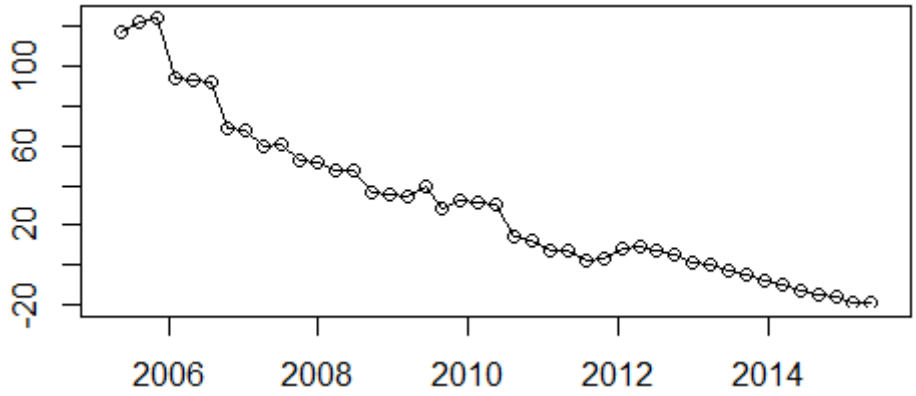


Figure 7 *BVPS*- Average by time

Some descriptive statistics from each variable are exhibited in Table 1. This view aggregates all time-series and cross-sections. Looking specifically to Liquidity, it brings attention to the high mean, maximum, and standard deviation. This fact is concerned to the characteristic of a great part of companies: many are holding companies that represent their groups in the capital market. It was identified 73 cases of liquidity higher than 5.0 (current assets are more than 5 times current liabilities). The maximum value found, 1,139.4, was from an insurance company, the *Porto Seguro SA*.

Table 1 Descriptive statistics

	Mean	Max	Min	Standard Deviation
Ret	-0.02	2.8	-2.0	0.3
Liq	3.9	1,139.4	0	20.3
BVPS	31.2	11,310.5	-3,279.7	493.3
EPS	-1.4	3,292.3	-1,724.2	126.1

Some series do not appear to be stationary by plotting their mean by time. *Liq* and *Ret* seemed to have some seasonality, and *BVPS* and *EPS* appear to have some negative trend as is shown in Figure 1. This observation by "naked eyes" is not reliable, once the graphs represented the mean of variables and it is possible that few individuals are biasing the sample.

The four variables were tested for their stationarity condition with unit root and stationarity tests. It was chosen the IPS (Im, Pesaran, & Shin, 2003) test, which uses ADF - Augmented Dickey Fuller (Said & Dickey, 1984) methodology. The null hypothesis of IPS test is I(1) for all of the individuals. The variables were also tested by Hadri (Hadri, 2000) test, which uses KPSS - Kwiatkowski–Phillips–Schmidt–Shin (Kwiatkowski, Phillips, Schmidt, & Shin, 1992) methodology to test stationarity in panel data. The null hypothesis of Hadri test is that the variable is stationary through the panel.

IPS test rejected the null hypothesis, for intercept and intercept and trend, to all series. In the other hand, Hadri test has rejected the stationarity hypothesis to all variables, with intercept or intercept and trend, excepting by the *Ret* variable when tested with constant and trend. The results are shown in Table 2.

Table 2 Unit root and stationary tests

Variable	IPS (intercept)	IPS (intercept and trend)	Hadri (intercept)	Hadri (intercept and trend)
Ret	Reject H_0	Reject H_0	Reject H_0	Do not reject H_0
Liq	Reject H_0	Reject H_0	Reject H_0	Reject H_0
BVPS	Reject H_0	Reject H_0	Reject H_0	Reject H_0
EPS	Reject H_0	Reject H_0	Reject H_0	Reject H_0

There is no need to restrict the dynamic behavior of the data by differentiation because the panel has a large *n* dimension and relatively small *T*.(Wooldridge, 2002, p. 175) says: "[…] a large cross section and relatively short time series allow us to be agnostic about of temporal persistence". Thus the data was maintained as original to the analysis.

To explore the relation between the variables, the data was analyzed by using the panel data structure. The panel was created and organized in the long form (in contrast with the wide form); it resulted in a 9,073 x 06 panel composed of the 04 variables – *Ret*, *Liq*, *BVPS* and *EPS* –, and the Time (*T*) and Individual (*n*) columns. The panel is included in the category of balanced panel because it has not missing data, simplifying the analysis. In the size aspect, according to (Cameron & Trivedi, 2005) classification, the panel is classified as a *short panel*, because it has a large number of entities - or large *n* - and relatively few time periods, that is, the cross-sectional dimension is bigger than the time-series dimension. Lastly, as it was analyzed the same entities by all time periods, the panel was classified as a *fixed panel*, according to (Greene, 2008) classification.

Trying to estimate the better model that explains returns by financial information, it was tried several models with the available methodologies elaborated to panel data structures. It was estimated polling models, fixed effects models, and random effects

models, and then they were put against each other to find the better estimators. It was worked with different combination of explanatory variables to each model. All modeling and testing were made using the **plm** package to the R environment from (Croissant, Millo, & others, 2008).

The first model estimated was the pooled ordinary least square (POLS). It consisted in a regression were parameter are the same for all *i* and *t*. the linear panel model specified was

$$Ret_{it} = \alpha + \boldsymbol{X_{it}}\boldsymbol{\beta} + u_{it} \,, \qquad (2)$$

where $i = 1, \ldots 211$ is the stock index, $t = 1, \ldots 43$ is the quarter index, $\boldsymbol{X_{it}}$ is a matrix of explanatory variables through *i* and *t*, α and the vector $\boldsymbol{\beta}$ are parameters to be estimated and u_{it} is a random disturbance.

The equation (1) was estimated to all combinations of *Liq*, *EPS*, and *BVPS* and they were tested for heteroscedasticity. Another tests performed was to identify unobserved effects.

Then, it was estimated the following models for unobserved (fixed or random) individual, time or two ways effect respectively

$$Ret_{it} = \boldsymbol{X_{it}}\boldsymbol{\beta} + c_i + u_{it} \,, \qquad (3)$$

$$Ret_{it} = \boldsymbol{X_{it}}\boldsymbol{\beta} + c_t + u_{it} \,, \qquad (4)$$

$$Ret_{it} = \boldsymbol{X_{it}}\boldsymbol{\beta} + c_{it} + u_{it} \,, \qquad (5)$$

where $t = 1, \ldots 44$ and $i = 1, \ldots 211$, $\boldsymbol{X_{it}}$ is a matrix of explanatory variables through *i* and *t*, the vector $\boldsymbol{\beta}$ are parameters to be estimated and u_{it} is a random disturbance. The models were estimated for all explanatory variables combination composing the matrix $\boldsymbol{X_{it}}$. Some tests were performed in order to compare the models.

Models that were indicated by test as having the best estimators were tested for residual serial correlation and cross-section dependence. The sample was identified as carrier of cross-sectional dependence as exposed in section 6.

A set of vector autoregressive was estimated in order to collate with results of the panel data, once it was not explored the cross-sectional dependence issue. It was made although the restricted range of time (43 observation). The series were tested for stationarity and cointegration before the VAR estimation.

Exploration it was conducted a precedence test to identify if accounting information may anticipate returns. The chosen test was Granger causality test (Granger, 1969) of order 1.

Findings

Panel data

Polled OLS Model

The heteroscedasticity test used was the Breusch-Pagan (Trevor S Breusch & Pagan, 1979). The null hypothesis is homoscedasticity.

Table 3 Breusch-Pagan test to pooling models

Specification	P-Value	Result
$Ret_{it} = \alpha + \beta_1 Liq_{it} + u_{it}$	0.000	H0 rejected
$Ret_{it} = \alpha + \beta_2 BVPS_{it} + u_{it}$	0.130	H0 not rejected
$Ret_{it} = \alpha + \beta_3 EPS_{it} + u_{it}$	0.825	H0 not rejected
$Ret_{it} = \alpha + \beta_1 Liq_{it} + \beta_2 BVPS_{it} + u_{it}$	0.000	H0 rejected
$Ret_{it} = \alpha + \beta_1 Liq_{it} + \beta_3 EPS_{it} + u_{it}$	0.000	H0 rejected
$Ret_{it} = \alpha + \beta_2 BVPS_{it} + \beta_3 EPS_{it} + u_{it}$	0.173	H0 not rejected
$Ret_{it} = \alpha + \beta_1 Liq_{it} + \beta_2 BVPS_{it} + \beta_3 EPS_{it} + u_{it}$	0.000	H0 rejected

The test identified that the disturbance variance may vary across individuals in the presence of the explanatory variable *Liq*. The existence of heteroscedasticity makes the POLS no longer the best unbiased linear estimator. Indeed, the homoscedastic assumption that the error term is not correlated with the explanatory variables is very strong. To deal with this problem is actually the foremost motivation of panel data models: to solve the omitted variable problem (Wooldridge, 2002).

Tests to identify unobserved effects

It was observed by the rejecting of the null hypothesis, that the POLS model is better than fixed individual effect, the inexistence of individual fixed effect, as is shown in Table 4. The model (3) of fixed time effect was compared with the POLS model also, and the results can be observed in Table 5. The F-test indicates, as rejecting the null hypothesis, that there are significant time effects in the sample.

Table 4 F-test between polled and fixed individual effect model

Explanatory variables	P-Value	Result
Liq	0.994	H0 not rejected
BVPS	0.995	H0 not rejected
EPS	0.993	H0 not rejected
Liq and *BVPS*	0.995	H0 not rejected
Liq and *EPS*	0.993	H0 not rejected
BVPS and *EPS*	0.999	H0 not rejected
Liq, BVPS and *EPS*	0.999	H0 not rejected

Table 5 F-test between polled and fixed time effect model

Explanatory variables	P-value	Result
Liq	0.000	H0 rejected
BVPS	0.000	H0 rejected
EPS	0.000	H0 rejected
Liq and *BVPS*	0.000	H0 rejected
Liq and *EPS*	0.000	H0 rejected
BVPS and *EPS*	0.000	H0 rejected
Liq, BVPS and *EPS*	0.000	H0 rejected

The same process was implemented for random effect model. The Breusch-Pagan Lagrange Multiplier (Trevor Stanley Breusch & Pagan, 1980) test for random effects was performed. The null hypothesis of this test is there are no random effects, in other words: POLS is a better model. The following results are to individual, time and *two ways* (both time and individual) effects. It was detected by tests that two ways random effects were present in the sample.

Table 6 Breusch-Pagan Lagrange Multiplier test between polled and random effect model

6.a Individual random effect

Explanatory variables	P-Value	Result
Liq	0.017	H0 rejected
BVPS	0.008	H0 rejected
EPS	0.018	H0 rejected
Liq and *BVPS*	0.008	H0 rejected
Liq and *EPS*	0.018	H0 rejected
BVPS and *EPS*	0.001	H0 rejected
Liq, BVPS and *EPS*	0.002	H0 rejected

6.b Time random effect

Explanatory variables	P-Value	Result
Liq	0.000	H0 rejected
BVPS	0.000	H0 rejected
EPS	0.000	H0 rejected
Liq and *BVPS*	0.000	H0 rejected
Liq and *EPS*	0.000	H0 rejected
BVPS and *EPS*	0.000	H0 rejected
Liq, BVPS and *EPS*	0.000	H0 rejected

6.c Two ways random effect

Explanatory variables	P-Value	Result
Liq	0.000	H0 rejected
BVPS	0.000	H0 rejected
EPS	0.000	H0 rejected
Liq and *BVPS*	0.000	H0 rejected
Liq and *EPS*	0.000	H0 rejected
BVPS and *EPS*	0.000	H0 rejected
Liq, *BVPS* and *EPS*	0.000	H0 rejected

Test between fixed and random time effect

The succeeding stage was to test which fixed or random models were best estimated once both models were identified better than POLS. It was possible by the Hausman (Hausman, 1978) test. Under the null hypothesis of no correlation, fixed (FEM) and random effects model (REM) are consistent, but the fixed model is inefficient. The alternative is that FEM is consistent, but REM is inconsistent and biased. Under the null hypothesis the estimation from both models should not differ systematically (Greene, 2008). Once F-test pointed to time effects only, the Hausman test was performed just for one-way time effect. Five explanatory combinations were better explained by REM and two combinations were better modeled by FEM as is shown in the table below.

Table 7 Hausman test

Explanatory variables	P-value	Result
Liq	0.512	H0 not rejected
BVPS	0.168	H0 not rejected
EPS	0.007	H0 rejected
Liq and *BVPS*	0.343	H0 not rejected
Liq and *EPS*	0.002	H0 rejected
BVPS and *EPS*	0.295	H0 not rejected
Liq, *BVPS* and *EPS*	0.415	H0 not rejected

Coefficients

The estimations of the time FEM and REM are exhibited in the Tables 8 and 9. Some observation can be done:

1. The coefficient to *Liq* is not statistically different from zero;
2. *BVPS* is statistically significant and contributed to a negative change in *Ret*;
3. *EPS* is statistically significant only in the presence of *BVPS* and contribute positively in the FEM and had a dubious effect in REM;
4. The intercept is not statistically significant in REM;
5. The explanatory power of the models measured by the Adjusted R^2 is very low.

Table 8 Fixed time effect model coefficients

	Coefficients			Model P-value	Adjusted R^2
	β_1 (Liq)	β_2 (BVPS)	β_3 (EPS)		
Estimation	-4.98E-05	-	-	0.6856109	1.806E-05
P-value	0.6856109	-	-		
Estimation	-	-1.45E-05	-	0.0043099	0.0008977
P-value	-	0.0043099	-		
Estimation	-	-	2.20E-06	0.9117417	1.354E-06
P-value	-	-	0.9117417		
Estimation	-4.80E-05	-4.80E-05	-	0.0157626	0.0009144
P-value	0.6963767	0.0043397	-		
Estimation	-4.99E-05	-	2.23E-06	0.9155096	1.946E-05
P-value	0.6852693	-	0.9103463		
Estimation	-	-3.701E-05	1.14E-04	2.13E-05	0.0023683
P-value	-	3.538E-06	0.0002564		
Estimation	-4.82E-05	-3.7E-05	1.14E-04	7.653E-05	0.002385
P-value	0.6946513	3.561E-06	0.0002563		

Table 9 Random time effect model coefficients

	Coefficients				Model P-value	Adjusted R^2
	Intercept	β_1 (Liq)	β_2 (BVPS)	β_3 (EPS)		
Estimation	-0.0150137	-5.07E-05	-	-	0.680089	1.87E-05
P-value	0.4113118	0.680089	-	-		
Estimation	-0.0147629	-	-1.432E-05	-	0.0047078	8.80E-04
P-value	0.3923704	-	0.0047078	-		
Estimation	-0.0152058	-	-	2.555E-06	0.8974126	1.83E-06
P-value	0.3945305	-	-	0.8974126		
Estimation	-0.0145741	-4.90E-05	-1.431E-05	-	0.0170132	8.98E-04
P-value	0.3994123	0.6901606	0.004739	-		
Estimation	-0.0150097	-5.08E-05	-	2.59E-06	0.9105914	2.06E-05
P-value	0.4016802	0.6794845	-	0.8960419		
Estimation	-0.0139024	-	-3.686E-05	0.000114	2.333E-05	2.35E-03
P-value	0.4253601	-	3.899E-06	0.00026		
Estimation	-0.0137127	-4.93E-05	0.000114	-4.927E-05	8.317E-05	2.37E-03
P-value	0.4330098	0.6885501	3.922E-06	0.0002598		

Test for serial correlation and cross-sectional dependence

Fixed time effects models were tested for serial correlation by the *Wooldridge's test for serial correlation in short FEM panels* (Wooldridge, 2002) and for random time effects models was used the *Conditional LM test for AR(1) or MA(1) errors under random*

effects from Baltagi and Li (Baltagi & Li, 1995), as recommended by (Croissant et al., 2008). Tests indicated that FEM have no serial correlation, by not rejecting the null hypothesis of no serial correlation. In the other hand, the REM presented serial correlation by rejecting the H0. The test's results are presented ahead.

Table 8 Serial correlation tests

Table 8.a Wooldridge's test for serial correlation in fixed effect panels

Specification	P-value	Result
$Ret_{it} = c_i + \beta_1 Liq_{it}$	0.666	H0 not rejected
$Ret_{it} = c_i + \beta_2 BVPS_{it}$	0.695	H0 not rejected
$Ret_{it} = c_i + \beta_3 EPS_{it}$	0.666	H0 not rejected
$Ret_{it} = c_i + \beta_1 Liq_{it} + \beta_2 BVPS_{it}$	0.695	H0 not rejected
$Ret_{it} = c_i + \beta_1 Liq_{it} + \beta_3 EPS_{it}$	0.666	H0 not rejected
$Ret_{it} = c_i + \beta_2 BVPS_{it} + \beta_3 EPS_{it}$	0.748	H0 not rejected
$Ret_{it} = c_i + \beta_1 Liq_{it} + \beta_2 BVPS_{it} + \beta_2 EPS_{it}$	0.747	H0 not rejected

Table 8.b Baltagi and Li one-sided LM test

Specification	P-value	Result
$Ret_{it} = \alpha + \beta_1 Liq_{it}$	0.000	H0 rejected
$Ret_{it} = \alpha + \beta_2 BVPS_{it}$	0.000	H0 rejected
$Ret_{it} = \alpha + \beta_3 EPS_{it}$	0.000	H0 rejected
$Ret_{it} = \alpha + \beta_1 Liq_{it} + \beta_2 BVPS_{it}$	0.000	H0 rejected
$Ret_{it} = \alpha + \beta_1 Liq_{it} + \beta_3 EPS_{it}$	0.000	H0 rejected
$Ret_{it} = \alpha + \beta_2 BVPS_{it} + \beta_3 EPS_{it}$	0.000	H0 rejected
$Ret_{it} = \alpha + \beta_1 Liq_{it} + \beta_2 BVPS_{it} + \beta_2 EPS_{it}$	0.000	H0 rejected

The next assumption to be tested is cross-sectional dependence (henceforth: *XSD*). It was performed *the Pesaran CD test for cross-sectional dependence in panels* (Pesaran, 2004) and it was identified that there is *XSD* in the data. This characteristic of data can be caused by two factors: when individuals respond to common shocks or when some spatial diffusion is present, as is recurrent in clustered samples. The consequence of *XSD "[...] is, at a minimum, inefficiency of the usual estimators and invalid inference when using the standard covariance matrix.*" (Croissant et al., 2008) p.28.

Vector autoregressive

Individual stationarity tests

To test stationary and unit root it was used ADF test and KPSS test. It was followed the recommendation of running both tests because of their low power. *Ret* series was tested individually and it was found 192 cases that KPSS identified as stationary with .05 (significance) level, and ADF classified as without unit root. Two cases, SGAS3 and SGAS4, were identified as non-stationary and with unit root. 17 cases were classified differently by tests. When *BVPS* was tested, it was found 5 stationary series (both tests agreeing), 150 cases of non-stationary (both tests agreeing), 51 that have unit-root according to ADF test and 5 cases of non-stationary series according to KPSS test. To *EPS*, tests presented 39 stationary series; 74 with unit root and non-stationarity, according to ADF and KPSS; 95 accepted the null hypothesis to both tests; and 3 that reject the null hypothesis to both tests. To the variable *Liq*, in turn, both tests agreed in 114 cases: they have shown 49 cases of stationary series, and 65 non-stationary series. 49 cases barred by KPSS and 84 in the ADF.

Cointegration test

A cointegration test (Engle & Granger, 1987) was performed to identify if a series characterized as nonstationary had a long-run relation with other nonstationary variables of the same stock. Non cointegration was identified.

VAR

To follow the VAR (1) procedure, all non-stationary series were differentiated and then, the following model was specified

$$Ret_{it} = \beta_{11}\, Ret_{i,t-1} + \beta_{12} Liq_{i,t-1} + \beta_{13} BVPS_{i,t-1} + \beta_{14} EPS_{i,t-1} \ .$$

$$Liq_{it} = \beta_{21}\, Ret_{i,t-1} + \beta_{22} Liq_{i,t-1} + \beta_{23} BVPS_{i,t-1} + \beta_{24} EPS_{i,t-1} \ .$$

$$BVPS_{it} = \beta_{31}\, Ret_{i,t-1} + \beta_{32} Liq_{i,t-1} + \beta_{33} BVPS_{i,t-1} + \beta_{34} EPS_{i,t-1} \ .$$

$$EPS_{it} = \beta_{41}\, Ret_{i,t-1} + \beta_{42} Liq_{i,t-1} + \beta_{43} BVPS_{i,t-1} + \beta_{44} EPS_{i,t-1} \ .$$

It was tested for residual serial correlation. It was found 194 cases without residuals serial correlation, and 17 with serial correlation in the VAR (1) specified above. A VAR (2) was estimated to the cases of serial correlation and it was possible to "clean" the residuals for 12 of the 17 cases. It was decided to do not estimate for higher lags in order to not compromise the degrees of freedom.

The VAR analysis did not show a common behavior. It was analyzed just the models with residuals not correlated and 45 of the 206 models were classified as significant. The coefficient showed to be differently significant and having a different effect in the sense of increasing or decreasing the dependent variable to each stock. The complete results of the VAR analysis can be found in Appendix 2.

Granger causality test

The result of the Granger causality test showed that it has not relationship between the variables that are significant at .05 significant level. The full results of the test can be found in Appendix 3.

Table 9 Granger Causality between the variable *Ret* and *Liq*

	Ret and *Liq*	
	Nº	Nº cases that p-value < .05
Simultaneity	187	0
Ret → *Liq*	9	0
Ret ← *Liq*	12	0
Independency	3	3
	Ret and *BVPS*	
	Nº	Nº cases that p-value < .05
Simultaneity	163	0
Ret → *BVPS*	16	0
Ret ← *BVPS*	29	0
Independency	3	3
	Ret and *EPS*	
	Nº	Nº cases that p-value < .05
Simultaneity	171	0
Ret → *EPS*	26	0
Ret ← *EPS*	8	0
Independency	6	6

Discussion

Higher liquidity generates lower returns according to the panel data results, but it had not presented to be statistically significant at the .05 significance level. In the VAR analysis, however, the sample had 19 cases of significant negative coefficients and 29 cases of significant positive coefficients to this variable. The ambiguity of the result brings doubts about the informational content of the variable *Liq*. It goes in conformity with the study of (Kühl, Cherobim, & SANTOS, 2008), which brought that this variable had positive correlation with returns in almost 70% of cases and a negative correlation in the rest of their sample, despite the weakness of the correlation. It corroborates to the non-significant informational content of this variable.

The panel data analysis shows a negative effect of *BVPS* above returns. It goes against the work of (Lopes et al., 2007) and (Lima, 2010), that had catch a positive effect of book value above share prices. The VAR analysis had presented an ambiguous behavior to the

same variable: In the sample of 211 shares, the VAR (1) brought 98 cases of negative $BVPS_{t-1}$ and 113 positive cases. The VAR (2) estimated to the 17 cases of serial correlation, it had 8 cases of negative $BVPS_{t-1}$ and 9 of $BVPS_{t-2}$. The proportion of positive and negative cases, of almost 50/50, remains when only significant (at the .05 level) coefficients are considered. Those evidences brings uncertain about the informational content of the *BVPS* variable, in conformity with the (Leite & Sanvicente, 1990) work.

The variable *EPS* presented and ambiguous effect above returns in the panel analysis as well in the VAR analysis. It corroborates with works of (Bruni & Famá, 1998), (Terra & Lima, 2006), (Pereira, 2006), (Kühl et al., 2008), and (Brugni et al., 2015).

Conclusion

This study tried to bring new evidences to the capital market-based accounting research in Brazil. It was shown how controversial and underexplored this area still is in Brazilian academy, which may reflect the recent changes in the Brazilian capital market, turning the econometrical treatment tricky and findings hardly comparable.

With the implementation of an unusual econometric approach, the panel data analysis, it was proposed a way to reduce the onus of having a short time dimension by including the cross sectional dimension. This task showed to be challenging because the characteristic of the data of cross section dependence. Other choices taken here shall be better explored in the future, as deal with the selection bias and expand the range of explanatory variables.

The findings goes in direction to the semi-strong form of market efficiency, once the accounting variables had not shown to be an appropriate tool to predict returns. However the totally disconnection between variables may characterize a capital market that agents had no confidence in the financial information provided by companies, once was evidenced that variables had no informational content. It may reflect the way Brazilian capital market is organized, with the existence of country-factors as bank-oriented funding system, continental model and the tendency of accounting of being taxes-oriented.

The finding of cross sectional dependence between the shares information may reduce the capacity of take conclusions of results, but it may evidence an important feature of Brazilian capital market: that returns are subordinate to external variables as macroeconomic and sectorial ones.

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Vol. 4, No. 5, May, 2017
ISSN 2383-2126 (Online)

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Appendix A

Author	Object	Method	Period and Freq.	Variable	Sample	Result and Conclusion
(Leite & Sanvicente, 1990)	Discuss the use of book value per share in the investment decision.	Event study	Jan/ 1989 to Apr/ 1989 (Daily)	Book value	43 shares listed on BM&FBOVESPA	The book value hasn't significant informational contend because, perhaps, the anticipation of the financial disclosure.
(Scbiehll, 1996)	Test if financial disclosures influence the pricing process.	Event study	Jan/ 1987 to Apr/ 1995 (Monthly)	Earnings	90 companies listed on BM&FBOVESPA	Announcements are relevant to the market. It was concluded that the Brazilian capital market is efficient in the semi-strong form.
(Bruni & Famá, 1998)	Analyses which factors are relevant in the association with stocks returns.	Bivariat Analysis	1988 to 1996	Debt, book value, earnings, cash flow and sales growth.	330 shares listed on BM&FBOVESPA	The variables debt and book value revel to be significant.
(Antunes & Procianoy, 2003)	Test the impact of investment decision in the stock prices.	Event study	Mar /1989 to Aug/ 1999 (Monthly)	Non-current assets variation	360 shares listed on BM&FBOVESPA	Results pointed to a relation between the non-current assets variation and value of equity. There is a link between stock prices and financial disclosures, indicating inefficiency.
(Terra & Lima, 2006)	Investigate if informational content of financial disclosures is capable to influencing stock prices	Event study	1995 to 2002	Earnings	255 stocks listed on BM&FBOVESPA	Abnormal earnings are not statistically significant to the whole sample but significant to some sub-sample. Taking the result to the whole sample, it corroborates the efficient market semi-strong hypothesis.
(Martinez, 2004)	Analyze the informational content of the earnings announcement to the analyst expectation.	Event study	1996 to 2003 (Daily)	Earnings	Companies listed on BM&FBOVESPA	The market reacts to the announcement of unexpected result significantly. To negative surprises, the market seems to anticipate the announcement. The market is inefficient, once is possible to gain with private information about a company result.
(Sarlo Neto, Teixeira, Loss, & Lopes, 2005)	Investigate the impact of financial statements in stock prices through the observation of how returns react	Event study	1990 to 2002 (Yearly)	Earnings	93 companies listed on BM&FBOVESPA	Prices vary at the same direction that disclosure results. It corroborates the relevance of the information.

	to the earnings disclosures.					
(Pereira, 2006)	Analyze the influence of the surprise effect of earnings disclosure.	Panel data	2003 to 2005 (Quarterly)	Earnings	Companies from the metallurgical industry listed on BF&FBOVESPA	Market did not react to the earnings publication. The market is efficient in a semi-strong form.
(Galdi & Lopes, 2008)	Try to identify whether there is a long-term relation and causality between earnings and stock prices in Latin America.	Co-integration test and Granger Causality	1995 to 2005	Earnings	41 open companies from Latin America	There is a long-term relationship between earnings and stock prices, but it is not clear the direction of the causality.
(Lopes et al., 2007)	Analyze the relevance of accountig information under the theoretical framework provide by Ohlson 1995 (RIV) and 2003 (AEG).	OLS with White correction	1994 to 2003 (Yearly)	Earnings and book value	206 companies listed on BM&FBOVESPA	The RIV model is numerically superior to AEG, but statistically superior only in two specifically samples. Both models are statistically significant.
(Kühl et al., 2008)	Verify if stock prices are better explained by internal or external indicators	Correlation and determination coefficients	1994 to 2004 (Quarterly)	Liquidity ratios, debt ratios and profitability ratios	137 stocks listed on BM&FBOVESPA	Inflation and IBOVESPA had the best explanatory values. External indicators have higher power the internal indicators.
(Neto, Galdi, & Dalmácio, 2009)	Study the features of the shares that react to the financial disclosures.	MANOVA	1995 to 2002 (Quarterly)	Earnings	91 companies listed on BM&FBOVESPA	The average of abnormal returns is sensible to the features of equity control and liquidity. It could take any conclusions because the sample did not attempt all the exigencies of the model.
(Lima, 2010)	Investigate the relevance of accountant information before and after the convergence process to IFRS.	Event study and timeliness model	1995 to 2009 (Quarterly and Yearly)	Earnings, book value	All companies listed on the BM&FBOVESPA	From Event study: Financial disclosure has informational content, but it was not identified changes with the implementation of IFRS. Timeliness: Same information under different mensuration norm change the investor expectation in a positive way.

(Campos et al., 2012)	Verify the relationship between the variables of companies with different grade of exigency.	Granger Causality	1995 to 2010 (Quarterly)	Market return and Return on equity	75 companies listed on BM&FBOVESPA	It was identified bicausality between variables. It was concluded that the market is inefficient to the analyzed sample. Companies with higher grade of exigencies did not show higher relevancy of information.
(Paulo et al., 2013)	Verify if prices react to earnings announcement and observe if this reaction varies through the days.	Event study	July/ 1999 to Mar/ 2008 (Daily)	Earnings	91 companies listed on BM&FBOVESPA	Market reacted just to "bad" news. The informational content is asymmetric.
(Ramos & Lustosa, 2013)	Verify if adoption of international standards of accountability made the financial statement change its value-relevance.	OLS	2004 to 2012 (Quarterly)	Earnings and book value	579 companies listed on BM&FBOVESPA	The value relevance of financial information measured by their explanatory power has increase with the standard change.
(Brugni et al., 2015)	Investigate if there is incentive to financial statements follow stock prices, and not the opposite.	Granger Causality	2003 to 2013 (Quarterly)	Earnings	36 companies listed on BM&FBOVESPA	To 11 companies earning precede prices and to 10 companies market anticipate the announcing. It was concluded that there is an efficiency in the medium and long-term, but room for speculation in the short-term. Larger firms are more susceptible to anticipation.
(dos Santos & Lustosa, 2015)	Identify the market behavior under earnings disclosure in the revenues and expenses perspective.	Event study	1999 to 2008 (Daily)	Revenues and expenses	96 companies listed on BM&FBOVESPA	Market is sensitive to negative variations of expenses and revenues. Positive variations are not statistically relevant. Positive and negative news have different informational content.

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ISSN 2383-2126 (Online)

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Appendix B

VAR(1)

	$\beta_1 (RET_{t-1})$		$\beta_2 (LIQ_{t-1})$		$\beta_3 (BVPS_{t-1})$		$\beta_4 (EPS_{t-1})$		Residual correl. (p-value)	Model P-value	Adjusted R2
ABEV3	0.155		0.031		- 0.010		0.366		0.822	0.192	0.056
AELP3	0.082		- 0.001		0.001	.	0.044		0.980	0.270	0.033
ALPA3	0.273		0.099	.	0.574		0.612		0.367	0.040	0.150
ATOM3	0.106		1.280		- 0.090	**	2.077		0.986	0.951	-0.088
BAHI3	0.147	*	0.001		0.010	**	0.027		0.006	0.423	-0.001
BAUH4	0.224		- 0.377		0.082		0.048		0.108	0.098	0.098
BAZA3	0.123		0.082		0.240	.	3.244		0.940	0.231	0.044
BBAS3	- 0.116		- 0.406		0.011	**	- 0.007		0.803	0.915	-0.080
BBDC3	0.110		- 0.209		0.065	**	- 0.010		0.591	0.492	-0.013
BBDC4	0.068		- 0.203		0.080	**	- 0.012		0.674	0.430	-0.002
BDLL4	- 0.064		- 0.046		0.000	**	- 0.000		0.764	0.985	-0.097
BEES3	0.100		- 0.593		0.235	**	0.333		0.495	0.620	-0.034
BGIP4	0.079		0.143	**	0.070		0.108		0.913	0.000	0.362
BMEB4	0.487		- 0.238	.	- 0.003		0.008		0.076	0.019	0.189
BMIN4	- 0.051		- 0.000		18.320	.	- 4.396		0.802	0.308	0.024
BMKS3	- 0.100		- 0.002		0.000	**	0.000		0.281	0.951	-0.088
BMTO3	0.162		0.022	.	0.052		0.111		0.714	0.049	0.138
BMTO4	0.077		0.031	*	- 0.070		0.275		0.132	0.002	0.297
BNBR3	- 0.091		- 0.363		- 0.008		0.037		0.550	0.165	0.066
BOBR4	0.155		0.376		- 0.003	**	0.002		0.762	0.489	-0.013
BRAP3	0.373		- 0.001		- 0.004	.	0.007		0.617	0.218	0.048
BRAP4	0.282		- 0.002		- 0.002	**	0.010		0.716	0.518	-0.017
BRFS3	0.144		0.001		- 0.009	**	- 0.039		0.393	0.458	-0.007
BRGE3	- 0.078		- 0.001		0.094	**	- 0.055		0.924	0.924	-0.082
BRGE6	- 0.389		- 0.007		- 0.002		0.061		0.862	0.137	0.078
BRIV3	0.189		- 0.009		0.092	.	- 0.191		0.502	0.289	0.028
BRIV4	- 0.103		- 0.002		- 0.036	**	- 0.050		0.715	0.827	-0.065
BRKM3	0.205		0.010		0.026		- 0.022		0.721	0.065	0.122
BRKM5	0.248		0.018		0.023		- 0.024		0.869	0.064	0.124
BRSR3	- 0.020		- 0.372	*	0.159		0.033		0.397	0.007	0.233
BRSR5	- 0.029		- 0.543		0.095	*	0.039		0.890	0.376	0.009
CBEE3	- 0.054		0.170		- 0.022	**	0.010		0.899	0.817	-0.064
CBMA4	- 0.125		0.328	*	0.057		0.022		0.999	0.007	0.232
CCRO3	- 0.126		0.003		- 0.037	**	0.328		0.854	0.652	-0.039
CEBR5	0.236		0.029		0.004	*	0.002		0.923	0.371	0.010
CEBR6	0.254		0.033		0.003	**	0.001		0.560	0.538	-0.021

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ISSN 2383-2126 (Online)

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CEDO4	-0.046		-0.007	·	0.012		0.041	0.421	0.011	0.214
CEEB3	0.088		-0.024		0.000	**	0.059	0.445	0.516	-0.017
CEPE5	0.075		0.003		-0.013		0.079	0.183	0.162	0.067
CESP3	0.162		-0.128		-0.005		-0.015	0.758	0.189	0.057
CESP5	0.107		0.035		-0.004		-0.017	0.893	0.121	0.086
CGAS3	-0.013		-0.039		-0.002	**	0.005	0.797	0.998	-0.105
CGAS5	-0.143		-0.199		0.004	**	0.004	0.760	0.828	-0.065
CGRA4	0.209	*	-0.134		-0.015	**	-0.006	0.009	0.440	-0.004
CLSC4	0.178	·	-0.007		0.009		-0.002	0.036	0.072	0.117
CMIG3	0.163		-0.006		-0.022	**	0.022	0.279	0.512	-0.016
CMIG4	0.151		-0.009		-0.034	**	0.010	0.535	0.438	-0.003
COCE3	0.155		-0.017		-0.018	**	0.030	0.821	0.436	-0.003
COCE5	-0.022		0.065		-0.028		0.044	0.747	0.076	0.113
CPFE3	-0.092		0.001		0.033		0.153	0.268	0.105	0.094
CPLE3	0.190		-0.003		0.000	·	0.060	0.545	0.298	0.026
CPLE6	0.019		-0.004		0.008	*	0.049	0.538	0.373	0.009
CRIV4	0.201		-0.010		-0.044	**	0.126	0.308	0.612	-0.033
CRPG5	-0.086		0.157	*	0.143		0.028	0.825	0.009	0.225
CRPG6	0.087		0.321	*	0.051		0.067	0.574	0.005	0.253
CSNA3	0.125		-0.122		-0.023	**	0.088	0.661	0.495	-0.014
CTKA4	-0.027		0.239		0.002	·	0.002	0.552	0.277	0.031
CTNM3	0.190		-0.005		0.022	·	-0.010	0.310	0.225	0.046
CTNM4	0.129		-0.007		0.033		-0.017	0.379	0.139	0.077
CTSA3	0.100		-0.146		0.260	·	0.066	0.892	0.243	0.040
CTSA4	-0.184		-0.001		0.053	**	0.150	0.830	0.418	0.000
DASA3	0.122		-0.006		-0.003	*	0.289	0.406	0.384	0.007
DTCY3	-0.244		-0.158		-0.017	**	0.011	0.927	0.584	-0.028
EALT4	-0.179		-0.263		-0.000	**	0.005	0.243	0.735	-0.051
EEEL3	0.141		0.043		-0.000	**	0.001	0.588	0.867	-0.072
EEEL4	-0.194		0.015		0.001	**	0.001	0.091	0.766	-0.056
EKTR4	0.075		0.092		-0.026	**	0.011	0.974	0.753	-0.054
ELEK3	-0.374		-0.235	·	0.223		-0.068	0.821	0.024	0.176
ELEK4	-0.315		-0.074	*	0.192		-0.045	0.923	0.005	0.252
ELET3	-0.223		0.042		0.006	**	0.004	0.256	0.462	-0.008
ELET6	-0.227		-0.014		0.002	**	-0.006	0.552	0.632	-0.036
ELPL3	-0.142		-0.835	·	0.013		0.058	0.493	0.046	0.142
EMAE4	0.030		0.008		0.009	**	0.013	0.887	0.883	-0.074
EMBR3	-0.130		0.017		-0.004	**	-0.017	0.778	0.927	-0.083
ENGI3	-0.020		0.011		-0.079	**	-0.001	0.206	0.966	-0.092
ENMT3	0.008		0.125		0.057	*	0.028	0.550	0.390	0.006
ESTR4	0.196		0.055		-0.048	**	-0.004	0.815	0.891	-0.076
ETER3	0.044		-0.092		0.119	**	0.161	0.864	0.784	-0.059
FBMC4	0.288		0.326		0.008		0.000	0.912	0.181	0.060

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ISSN 2383-2126 (Online)

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FESA4	0.106	·	0.007		-0.136	*	-0.012	0.023	0.392	0.005
FJTA3	0.328		-0.058	·	0.047		-0.022	0.252	0.042	0.147
FJTA4	0.346		-0.189	·	0.053		-0.021	0.405	0.019	0.187
GEPA3	-0.023		0.011		0.005	**	0.002	0.348	0.924	-0.082
GEPA4	0.158		-0.002		0.001	**	0.005	0.272	0.838	-0.067
GGBR3	0.214		0.006		-0.085		-0.006	0.947	0.108	0.092
GGBR4	0.198		0.006		-0.079		-0.009	0.916	0.169	0.065
GOAU3	0.490		-0.013	·	-0.007		-0.014	0.994	0.017	0.193
GOAU4	0.506		-0.015	·	0.005		-0.015	0.989	0.018	0.190
GPCP3	0.092		0.007		0.005	**	-0.000	0.779	0.890	-0.076
GRND3	0.171	·	-0.002		0.184		0.185	0.022	0.202	0.053
GUAR3	0.395	·	0.042	·	-0.017		0.070	0.039	0.026	0.172
GUAR4	0.353		0.026		-0.017		0.082	0.070	0.057	0.129
HAGA4	-0.047		0.875		-0.212	**	-0.211	0.686	0.685	-0.044
HBTS5	0.106		-0.096		-0.003	**	-0.005	0.873	0.960	-0.090
HGTX3	0.304		0.003		0.035		0.184	0.482	0.157	0.069
IDNT3	0.201		-0.000		-0.012	**	-0.012	0.469	0.705	-0.047
IGBR3	-0.336		1.499	·	0.006		0.009	0.633	0.019	0.189
IMBI4	-0.265		0.367		-0.023	**	0.046	0.195	0.487	-0.012
INEP4	0.280		-0.417		-0.000	**	-0.002	0.996	0.550	-0.023
ITEC3	0.088		-0.014		0.002	**	0.006	0.388	0.534	-0.020
ITSA3	0.237		-0.124		-0.058		0.126	0.095	0.193	0.056
ITSA4	0.172		-0.028		0.075	**	0.029	0.213	0.666	-0.041
ITUB3	-0.133		0.012		0.039	·	-0.032	0.985	0.363	0.011
ITUB4	-0.081		0.008		0.047	**	-0.034	0.949	0.493	-0.013
JBDU3	0.142		-0.029		-0.000	**	0.000	0.934	0.742	-0.052
JBDU4	0.229		-0.011		0.000	**	0.000	0.949	0.510	-0.016
JFEN3	0.399		-0.282	*	0.005		-0.010	0.886	0.009	0.222
KEPL3	0.416		0.054	*	0.000		0.002	0.669	0.002	0.298
KLBN3	0.211		0.010		0.047	**	-0.108	0.896	0.708	-0.047
KLBN4	0.153		0.006		-0.197	*	0.460	0.870	0.399	0.004
LAME3	0.191		-0.040		-0.071	**	0.162	0.914	0.809	-0.062
LAME4	0.347		0.057		0.063	·	-0.359	0.962	0.302	0.025
LIGT3	0.050		-0.000		-0.001	**	-0.011	0.990	0.494	-0.013
LIPR3	0.416		0.000	*	0.005		0.014	0.190	0.008	0.230
LIXC3	0.328		-0.370		-0.177		0.194	0.413	0.112	0.090
LIXC4	0.145		-1.092		-0.152		0.188	0.504	0.174	0.063
MAPT4	-0.220	·	-0.031		-0.159	·	0.216	0.046	0.342	0.016
MEND5	0.011		-0.073		-0.001	**	0.003	0.962	0.681	-0.043
MEND6	0.023		-0.073		-0.001	**	0.002	0.924	0.800	-0.061
MGEL4	-0.095		0.001		0.015	·	0.005	0.886	0.261	0.035
MLFT4	0.176		-0.003		-0.029	·	0.030	0.974	0.274	0.032
MNDL3	-0.459		1.156	·	0.006		0.013	0.752	0.044	0.144

MOAR3		0.142			0.000		-	0.001	**	-	0.003	0.516	0.689	-0.044
MTSA4		0.275			0.002		-	0.010	*		0.078	0.922	0.404	0.003
MYPK3		0.247			0.081		-	0.027		-	0.102	0.847	0.130	0.081
NATU3	-	0.088		-	0.068	·		0.016			0.506	0.912	0.018	0.189
NMA3B		0.365		-	0.195	*	-	0.008			0.033	0.221	0.005	0.255
OIBR3		0.195		-	0.057		-	0.000			0.007	0.958	0.180	0.061
PATI3	-	0.190		-	0.159			0.046	·	-	0.008	0.951	0.270	0.033
PATI4	-	0.090		-	0.152			0.032		-	0.007	0.971	0.201	0.053
PEAB4	-	0.173	*	-	0.001		-	0.001		-	0.001	0.005	0.155	0.070
PETR3	-	0.159			0.059			0.006	**		0.024	0.964	0.866	-0.072
PETR4	-	0.147			0.046			0.015	**		0.019	0.967	0.881	-0.074
PMAM3		0.226		-	0.361		-	0.028			0.020	0.674	0.145	0.074
PNVL3	-	0.098			0.025		-	0.008			0.106	0.734	0.094	0.101
PNVL4	-	0.059			0.027		-	0.024			0.100	0.319	0.112	0.090
POMO3		0.330		-	0.124	·	-	0.096			1.885	0.797	0.014	0.202
PSSA3		0.071		-	0.000			0.035	**		0.010	0.890	0.650	-0.038
PTBL3		0.018			0.591	*		1.337		-	0.141	0.977	0.009	0.225
PTPA4		0.073		-	0.000		-	0.000	**		0.006	0.998	0.822	-0.064
RADL3		0.315		-	0.088			0.095			1.318	0.996	0.064	0.123
RANI3		0.165			0.164		-	0.020	**		0.080	0.319	0.573	-0.026
RANI4		0.087			0.019		-	0.028	**		0.186	0.331	0.609	-0.032
RAPT3		0.290	·		0.009		-	0.057	**	-	0.017	0.031	0.419	0.000
RAPT4		0.233	·	-	0.028			0.091	**	-	0.034	0.013	0.578	-0.027
RCSL4		0.068			1.024		-	0.006			0.007	0.439	0.194	0.056
REDE3		0.065			0.008			0.009	**	-	0.029	0.668	0.954	-0.089
REDE4		0.086		-	0.003		-	0.004	**	-	0.018	0.757	0.979	-0.095
RGE11	-	0.067			0.006		-	0.149	**		0.145	0.897	0.572	-0.026
RGE12		0.065		-	0.003		-	0.103	**		0.185	0.899	0.606	-0.032
ROMI3		0.136		-	0.054			0.060	**	-	0.029	0.440	0.793	-0.060
RPAD3	-	0.126			0.014		-	0.072	**		0.235	0.447	0.482	-0.011
RPAD5		0.063			0.009			0.029	**		0.060	0.600	0.872	-0.073
RPAD6	-	0.082			0.004		-	0.109	**		0.152	0.608	0.859	-0.070
RSID3		0.404			0.001	·	-	0.001			0.010	0.386	0.035	0.156
SAPR4		0.022		-	0.280		-	0.022	**		0.631	0.868	0.418	0.000
SBSP3	-	0.008		-	0.182			0.009	**	-	0.000	0.852	0.925	-0.082
SHUL4		0.534			0.019	*		0.074		-	0.043	0.506	0.003	0.279
SLED4		0.093	**	-	0.008			0.040	·		0.077	0.000	0.295	0.027
SNSY5	-	0.172			0.989	·		0.001			0.000	0.885	0.037	0.153
SOND5		0.007	·		0.002		-	0.003	**		0.002	0.018	0.996	-0.102
SPRI3	-	0.283		-	0.001	·		0.036		-	0.010	0.130	0.042	0.146
SPRI5	-	0.279		-	0.000			0.021		-	0.003	0.225	0.190	0.057
SULT3	-	0.196			0.098			0.026	·	-	0.122	0.529	0.216	0.049
SULT4	-	0.172			0.138		-	0.002	**	-	0.072	0.895	0.491	-0.013

TBLE3		0.214		-	0.042		-	0.002	**	-	0.035	0.513	0.563	-0.025
TCNO3		0.122			0.227		-	0.014	**		0.044	0.965	0.428	-0.002
TCNO4		0.094		-	0.024		-	0.006	**		0.042	0.910	0.793	-0.060
TEKA3	-	0.140			0.834		-	0.000	·		0.000	0.450	0.361	0.012
TEKA4	-	0.096		-	0.211		-	0.000	**		0.000	0.215	0.854	-0.070
TELB3	-	0.018			0.051			0.003	**	-	0.003	0.835	0.943	-0.086
TELB4	-	0.033			0.134			0.000	**	-	0.003	0.753	0.851	-0.069
TIMP3	-	0.029		-	0.006			0.091	**	-	0.066	0.251	0.908	-0.079
TKNO4	-	0.004			0.000			0.012	**	-	0.006	0.297	0.738	-0.052
TOYB3		0.133			0.074		-	0.002	**	-	0.006	0.753	0.531	-0.020
TOYB4		0.094			0.096		-	0.001	**	-	0.009	0.710	0.530	-0.019
TRPL3	-	0.144		-	0.001			0.019			0.018	0.978	0.146	0.074
TRPL4		0.270			0.019	·		0.029			0.019	0.858	0.047	0.140
TUPY3		0.179			0.001			0.020	**	-	0.011	0.868	0.747	-0.053
TXRX4	-	0.077		-	0.279		-	0.001	**		0.004	0.982	0.847	-0.068
UNIP3		0.248	·		0.008	*		0.060		-	0.019	0.013	0.005	0.247
UNIP5		0.093	·		0.029	·		0.056		-	0.016	0.023	0.010	0.219
UNIP6		0.121	·		0.008			0.046		-	0.011	0.014	0.051	0.136
USIM3		0.074		-	0.061			0.161	**	-	0.047	0.768	0.471	-0.009
USIM5		0.120		-	0.061			0.131	**	-	0.014	0.576	0.432	-0.002
USIM6		0.119			0.020			0.049	**	-	0.101	0.299	0.770	-0.056
VALE3		0.175		-	0.025			0.001	*		0.003	0.628	0.386	0.007
VALE5		0.174		-	0.028			0.001	·		0.003	0.635	0.314	0.022
VIVT3		0.069		-	0.131			0.003	**	-	0.001	0.962	0.658	-0.040
VIVT4	-	0.090		-	0.213			0.004	·	-	0.002	0.730	0.288	0.028
WHRL3		0.091			0.227		-	0.019	·		0.496	0.742	0.292	0.027
WHRL4		0.152			0.160		-	0.063	**		0.336	0.611	0.469	-0.009
SGAS3	-	0.730			0.007	**		0.058		-	0.006	0.096	0.000	0.435
SGAS4	-	0.533			0.002	·		0.056		-	0.008	0.118	0.032	0.161
ENMT4	-	0.557			0.094	**		0.042		-	0.062	0.552	0.001	0.320
OIBR4	-	0.541			0.082	*	-	0.001			0.000	0.687	0.005	0.248
PCAR4	-	0.563		-	0.024	*	-	0.024		-	0.009	0.876	0.001	0.317
ALPA4		0.222			0.048	·		0.615			0.376	0.246	0.014	0.201
CRIV3		0.432			0.008		-	0.085			0.034	0.059	0.125	0.084
DOHL4		0.106		-	0.000		-	0.048			0.806	0.595	0.132	0.080
EUCA4		0.182		-	0.121			0.020	·		0.074	0.553	0.216	0.048
GOLL4	-	0.238			0.001	*		0.013			0.079	0.797	0.008	0.227
HOOT4		0.168		-	0.015		-	0.064	**		0.031	0.978	0.677	-0.042
MWET4		0.609		-	0.342	*	-	0.007			0.021	0.972	0.001	0.312
PEAB3	-	0.266	*	-	0.001		-	0.001			0.001	0.002	0.085	0.107
POMO4		0.288		-	0.071	·		0.432			1.584	0.529	0.029	0.167
PTNT4		0.169			0.071	**		0.047			1.360	0.694	0.000	0.501
RPMG3		0.263	*		0.052	·	-	0.002			0.006	0.007	0.037	0.153

International Journal of Management, Accounting and Economics
Vol. 4, No. 5, May, 2017
ISSN 2383-2126 (Online)

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SCAR3	0.353	- 0.006	0.001		0.030	0.864	0.135	0.079
SUZB5	0.211	0.100	- 0.020	-	0.019	0.596	0.137	0.078
WEGE3	0.185	0.001	- 0.071	**	1.027	0.626	0.446	-0.005

VAR (2)

	$\beta_1 (RET_{t-1})$	$\beta_2 (LIQ_{t-1})$	$\beta_3 (BVPS_{t-1})$	$\beta_4 (EPS_{t-1})$
BAHI3	0.093	0.001	0.002	0.029
CGRA4	0.189	- 0.147	- 0.013	0.306
CLSC4	0.260	- 0.009 .	0.011	- 0.002
FESA4	0.072	0.051 .	- 0.154	- 0.025
GRND3	0.128	0.016	0.156	0.140
GUAR3	0.299	0.036	- 0.019	0.081
MAPT4	- 0.248	0.001	- 0.166	0.212
PEAB4	- 0.235	- 0.000	- 0.000	- 0.001
RAPT3	0.376 .	- 0.007	- 0.008	- 0.193
RAPT4	0.230	- 0.039	0.115	- 0.326
SLED4	0.126	0.046	0.037	0.074
SOND5	- 0.006	0.154	- 0.008	0.003
UNIP3	0.211	0.001	0.063 .	- 0.026
UNIP5	- 0.092	0.041 *	0.030	0.013
UNIP6	0.125	0.015	0.044	- 0.003
PEAB3	- 0.060	- 0.001	- 0.002	0.000
RPMG3	0.059	0.143	- 0.010	0.013 .

	$\beta_5 (RET_{t-2})$	$\beta_6 (LIQ_{t-2})$	$\beta_7 (BVPS_{t-2})$	$\beta_8 (EPS_{t-2})$
BAHI3	0.073	0.002	- 0.007	0.016
CGRA4	- 0.055	- 0.040	- 0.010	- 0.349
CLSC4	0.185	0.001	0.007	- 0.014 .
FESA4	- 0.084	- 0.045	- 0.030	0.025
GRND3	- 0.013	- 0.020	- 0.088	0.512 *
GUAR3	- 0.036	0.015	- 0.041	0.106
MAPT4	- 0.009	- 0.090	- 0.107	0.082
PEAB4	- 0.186	- 0.001	0.002	0.000
RAPT3	- 0.180	- 0.074	0.355	0.127
RAPT4	- 0.066	- 0.115	0.280	0.257
SLED4	- 0.148	- 0.059	- 0.003	0.031
SOND5	- 0.018	- 0.154	- 0.002	- 0.004
UNIP3	- 0.055	- 0.007	0.010	- 0.004

UNIP5	-	0.065	0.027		0.038	-	0.007
UNIP6		0.081	0.009	-	0.003		0.004
PEAB3		0.355	0.001		0.001	-	0.000
RPMG3	-	0.088	0.509	**	0.004		0.003

	Residual correl. p-value	Model P-value	Adjusted R2
BAHI3	0.008	0.812	-0.100
CGRA4	0.154	0.741	-0.078
CLSC4	0.171	0.017	0.269
FESA4	0.728	0.248	0.069
GRND3	0.302	0.080	0.165
GUAR3	0.937	0.112	0.139
MAPT4	0.016	0.711	-0.070
PEAB4	0.001	0.447	0.002
RAPT3	0.809	0.244	0.070
RAPT4	0.691	0.398	0.017
SLED4	0.026	0.492	-0.010
SOND5	0.133	0.931	-0.145
UNIP3	0.100	0.072	0.173
UNIP5	0.526	0.008	0.311
UNIP6	0.208	0.263	0.062
PEAB3	0.002	0.067	0.179
RPMG3	0.060	0.000	0.544

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

International Journal of Management, Accounting and Economics
Vol. 4, No. 5, May, 2017
ISSN 2383-2126 (Online)

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APPENDIX C

Granger causality test – order 1

	Return -> EPS		Return <- EPS		Return -> BVPS		Return <- BVPS		Return -> Liq		Return <- Liq	
Stock	P-value	G. C	P-value	G. C	P-value	G. C	P-value	G. C	P-value	G. C	P-value	G. C
EALT4	0.148	Y	0.750	Y	0.085	Y	0.964	Y	0.063	Y	0.740	Y
AELP3	0.507	Y	0.306	Y	0.521	Y	0.504	Y	0.385	Y	0.017	N
BRGE3	0.641	Y	0.767	Y	0.116	Y	0.378	Y	0.508	Y	0.155	Y
BRGE6	0.586	Y	0.865	Y	0.130	Y	0.603	Y	0.716	Y	0.766	Y
RGE11	0.583	Y	0.596	Y	0.292	Y	0.372	Y	0.103	Y	0.750	Y
RGE12	0.278	Y	0.636	Y	0.238	Y	0.372	Y	0.312	Y	0.260	Y
CRIV3	0.729	Y	0.154	Y	0.259	Y	0.518	Y	0.719	Y	0.515	Y
CRIV4	0.878	Y	0.196	Y	0.344	Y	0.458	Y	0.712	Y	0.872	Y
RPAD3	0.639	Y	0.628	Y	0.040	N	0.298	Y	0.010	N	0.056	Y
RPAD5	0.707	Y	0.921	Y	0.124	Y	0.477	Y	0.035	N	0.665	Y
RPAD6	0.345	Y	0.298	Y	0.031	N	0.419	Y	0.033	N	0.331	Y
BRIV3	0.734	Y	0.904	Y	0.142	Y	0.751	Y	0.158	Y	0.179	Y
BRIV4	0.494	Y	0.871	Y	0.068	Y	0.546	Y	0.364	Y	0.263	Y
ALPA3	0.132	Y	0.802	Y	0.307	Y	0.322	Y	0.402	Y	0.645	Y
ALPA4	0.175	Y	0.352	Y	0.205	Y	0.064	Y	0.164	Y	0.761	Y
BAZA3	0.100	Y	0.653	Y	0.333	Y	0.501	Y	0.191	Y	0.338	Y
ABEV3	0.695	Y	0.388	Y	0.657	Y	0.062	Y	0.894	Y	0.023	N
CBEE3	0.945	Y	0.591	Y	0.308	Y	0.336	Y	0.555	Y	0.712	Y
ATOM3	0.812	Y	0.538	Y	0.732	Y	0.274	Y	0.533	Y	0.316	Y
BAHI3	0.535	Y	0.121	Y	0.271	Y	0.336	Y	0.662	Y	0.441	Y
BGIP4	0.239	Y	0.631	Y	0.399	Y	0.641	Y	0.180	Y	0.022	N
BEES3	0.669	Y	0.536	Y	0.057	Y	0.902	Y	0.553	Y	0.100	Y
BRSR3	0.977	Y	0.071	Y	0.224	Y	0.114	Y	0.428	Y	0.623	Y
BRSR5	0.366	Y	0.020	N	0.055	Y	0.002	N	0.112	Y	0.316	Y
BDLL4	0.901	Y	0.635	Y	0.198	Y	0.973	Y	0.051	Y	0.345	Y
BMKS3	0.247	Y	0.001	N	0.361	Y	0.894	Y	0.371	Y	0.810	Y
BOBR4	0.949	Y	0.121	Y	0.127	Y	0.323	Y	0.519	Y	0.017	N
BBDC3	0.004	N	0.015	N	0.158	Y	0.714	Y	0.538	Y	0.344	Y
BBDC4	0.001	N	0.015	N	0.056	Y	0.367	Y	0.387	Y	0.415	Y
BRAP3	0.158	Y	0.393	Y	0.027	N	0.940	Y	0.365	Y	0.456	Y
BRAP4	0.124	Y	0.347	Y	0.030	N	0.793	Y	0.312	Y	0.884	Y
BBAS3	0.292	Y	0.804	Y	0.085	Y	0.519	Y	0.334	Y	0.851	Y
BRKM3	0.197	Y	0.001	N	0.197	Y	0.655	Y	0.712	Y	0.137	Y
BRKM5	0.204	Y	0.001	N	0.083	Y	0.532	Y	0.724	Y	0.051	Y
BMTO3	0.906	Y	0.628	Y	0.027	N	0.931	Y	0.081	Y	0.380	Y

BMTO4	0.810	Y	0.815	Y	0.049	N	0.062	Y	0.020	N	0.171	Y
BRFS3	0.071	Y	0.022	N	0.192	Y	0.056	Y	0.571	Y	0.075	Y
CCRO3	0.142	Y	0.432	Y	0.332	Y	0.910	Y	0.363	Y	0.504	Y
CEBR5	0.980	Y	0.994	Y	0.861	Y	0.674	Y	0.883	Y	0.481	Y
CEBR6	0.373	Y	0.401	Y	0.703	Y	0.232	Y	0.850	Y	0.839	Y
CEDO4	0.361	Y	0.272	Y	0.726	Y	0.813	Y	0.722	Y	0.377	Y
EEEL3	0.740	Y	0.987	Y	0.084	Y	0.562	Y	0.246	Y	0.360	Y
EEEL4	0.803	Y	0.935	Y	0.371	Y	0.592	Y	0.431	Y	0.922	Y
CLSC4	0.557	Y	0.088	Y	0.143	Y	0.351	Y	0.190	Y	0.782	Y
CEPE5	0.187	Y	0.262	Y	0.896	Y	0.096	Y	0.404	Y	0.028	N
RANI3	0.809	Y	0.515	Y	0.795	Y	0.643	Y	0.091	Y	0.761	Y
RANI4	0.235	Y	0.710	Y	0.777	Y	0.891	Y	0.162	Y	0.756	Y
NMA3B	0.003	N	0.005	N	0.001	N	0.059	Y	0.467	Y	0.098	Y
MAPT4	0.697	Y	0.933	Y	0.417	Y	0.309	Y	0.752	Y	0.326	Y
CMIG3	0.837	Y	0.753	Y	0.245	Y	0.026	N	0.799	Y	0.896	Y
CMIG4	0.586	Y	0.648	Y	0.992	Y	0.019	N	0.703	Y	0.496	Y
CESP3	0.222	Y	0.824	Y	0.171	Y	0.073	Y	0.057	Y	0.548	Y
CESP5	0.150	Y	0.647	Y	0.301	Y	0.006	N	0.104	Y	0.398	Y
HGTX3	0.086	Y	0.378	Y	0.016	N	0.965	Y	0.026	N	0.380	Y
CBMA4	0.253	Y	0.098	Y	0.383	Y	0.756	Y	0.232	Y	0.627	Y
CEEB3	0.256	Y	0.497	Y	0.148	Y	0.435	Y	0.015	N	0.641	Y
COCE3	0.990	Y	0.482	Y	0.219	Y	0.479	Y	0.425	Y	0.577	Y
COCE5	0.985	Y	0.116	Y	0.078	Y	0.257	Y	0.468	Y	0.956	Y
CGAS3	0.421	Y	0.492	Y	0.184	Y	0.825	Y	0.382	Y	0.802	Y
CGAS5	0.211	Y	0.536	Y	0.122	Y	0.965	Y	0.256	Y	0.157	Y
CPLE3	0.402	Y	0.007	N	0.027	N	0.103	Y	0.499	Y	0.975	Y
CPLE6	0.574	Y	0.005	N	0.053	Y	0.147	Y	0.515	Y	0.886	Y
CTNM3	0.053	Y	0.516	Y	0.191	Y	0.550	Y	0.634	Y	0.093	Y
CTNM4	0.095	Y	0.453	Y	0.155	Y	0.888	Y	0.595	Y	0.144	Y
CPFE3	0.424	Y	0.254	Y	0.299	Y	0.116	Y	0.165	Y	0.895	Y
CRPG5	0.389	Y	0.165	Y	0.637	Y	0.376	Y	0.668	Y	0.850	Y
CRPG6	0.314	Y	0.438	Y	0.586	Y	0.658	Y	0.975	Y	0.942	Y
DASA3	0.347	Y	0.161	Y	0.136	Y	0.574	Y	0.432	Y	0.336	Y
PNVL3	0.863	Y	0.987	Y	0.863	Y	0.946	Y	0.537	Y	0.289	Y
PNVL4	0.852	Y	0.973	Y	0.346	Y	0.690	Y	0.368	Y	0.008	N
IMBI4	0.553	Y	0.942	Y	0.166	Y	0.444	Y	0.099	Y	0.687	Y
DOHL4	0.600	Y	0.083	Y	0.858	Y	0.607	Y	0.274	Y	0.503	Y
DTCY3	0.866	Y	0.372	Y	0.751	Y	0.082	Y	0.635	Y	0.313	Y
ELEK3	0.116	Y	0.291	Y	0.444	Y	0.139	Y	0.168	Y	0.490	Y
ELEK4	0.239	Y	0.131	Y	0.887	Y	0.596	Y	0.317	Y	0.487	Y
EKTR4	0.063	Y	0.506	Y	0.872	Y	0.689	Y	0.768	Y	0.592	Y
ELET3	0.735	Y	0.110	Y	0.086	Y	0.946	Y	0.023	N	0.022	N
ELET6	0.879	Y	0.341	Y	0.109	Y	0.809	Y	0.116	Y	0.060	Y

LIPR3	0.620	Y	0.219	Y	0.892	Y	0.367	Y	0.337	Y	0.087	Y
ELPL3	0.579	Y	0.924	Y	0.541	Y	0.626	Y	0.456	Y	0.398	Y
EMAE4	0.681	Y	0.860	Y	0.229	Y	0.312	Y	0.213	Y	0.989	Y
EMBR3	0.614	Y	0.598	Y	0.483	Y	0.414	Y	0.047	N	0.035	N
ENGI3	0.065	Y	0.027	N	0.143	Y	0.317	Y	0.989	Y	0.463	Y
ENMT3	0.444	Y	0.007	N	0.731	Y	0.040	N	0.363	Y	0.798	Y
ENMT4	0.716	Y	0.049	N	0.984	Y	0.313	Y	0.378	Y	0.942	Y
ESTR4	0.693	Y	0.594	Y	0.776	Y	0.205	Y	0.913	Y	0.769	Y
ETER3	0.963	Y	0.414	Y	0.280	Y	0.930	Y	0.975	Y	0.378	Y
EUCA4	0.736	Y	0.107	Y	0.232	Y	0.788	Y	0.742	Y	0.512	Y
PTPA4	0.668	Y	0.896	Y	0.694	Y	0.143	Y	0.865	Y	0.964	Y
BAUH4	0.805	Y	0.362	Y	0.390	Y	0.032	N	0.805	Y	0.384	Y
FESA4	0.441	Y	0.480	Y	0.149	Y	0.469	Y	0.135	Y	0.763	Y
FBMC4	0.338	Y	0.018	N	0.611	Y	0.030	N	0.944	Y	0.288	Y
FJTA3	0.251	Y	0.593	Y	0.258	Y	0.713	Y	0.210	Y	0.313	Y
FJTA4	0.075	Y	0.573	Y	0.107	Y	0.584	Y	0.123	Y	0.285	Y
GEPA3	0.824	Y	0.150	Y	0.392	Y	0.618	Y	0.539	Y	0.266	Y
GEPA4	0.712	Y	0.350	Y	0.035	N	0.710	Y	0.678	Y	0.800	Y
GGBR3	0.163	Y	0.002	N	0.006	N	0.306	Y	0.568	Y	0.194	Y
GGBR4	0.217	Y	0.002	N	0.009	N	0.514	Y	0.619	Y	0.418	Y
GOAU3	0.051	Y	0.000	N	0.014	N	0.017	N	0.237	Y	0.138	Y
GOAU4	0.035	N	0.000	N	0.018	N	0.007	N	0.268	Y	0.141	Y
GOLL4	0.589	Y	0.023	N	0.491	Y	0.097	Y	0.184	Y	0.851	Y
GPCP3	0.432	Y	0.621	Y	0.459	Y	0.990	Y	0.261	Y	0.231	Y
CGRA4	0.034	N	0.002	N	0.127	Y	0.953	Y	0.157	Y	0.739	Y
GRND3	0.544	Y	0.213	Y	0.899	Y	0.579	Y	0.511	Y	0.285	Y
GUAR3	0.172	Y	0.021	N	0.210	Y	0.086	Y	0.348	Y	0.654	Y
GUAR4	0.245	Y	0.011	N	0.315	Y	0.033	N	0.539	Y	0.736	Y
HBTS5	0.805	Y	0.255	Y	0.441	Y	0.442	Y	0.478	Y	0.490	Y
HAGA4	0.011	N	0.788	Y	0.046	N	0.963	Y	0.077	Y	0.616	Y
HOOT4	0.239	Y	0.800	Y	0.608	Y	0.576	Y	0.876	Y	0.993	Y
IDNT3	0.199	Y	0.074	Y	0.199	Y	0.358	Y	0.585	Y	0.449	Y
IGBR3	0.098	Y	0.874	Y	0.582	Y	0.878	Y	0.554	Y	0.597	Y
ROMI3	0.586	Y	0.266	Y	0.590	Y	0.107	Y	0.054	Y	0.292	Y
INEP4	0.261	Y	0.381	Y	0.915	Y	0.815	Y	0.223	Y	0.532	Y
MYPK3	0.681	Y	0.306	Y	0.380	Y	0.937	Y	0.452	Y	0.758	Y
ITSA3	0.306	Y	0.011	N	0.027	N	0.031	N	0.995	Y	0.774	Y
ITSA4	0.258	Y	0.071	Y	0.060	Y	0.271	Y	0.356	Y	0.202	Y
ITEC3	0.089	Y	0.437	Y	0.368	Y	0.750	Y	0.273	Y	0.116	Y
ITUB3	0.479	Y	0.276	Y	0.191	Y	0.600	Y	0.617	Y	0.117	Y
ITUB4	0.215	Y	0.158	Y	0.162	Y	0.263	Y	0.753	Y	0.102	Y
JBDU3	0.612	Y	0.919	Y	0.558	Y	0.405	Y	0.869	Y	0.079	Y
JBDU4	0.841	Y	0.948	Y	0.411	Y	0.756	Y	0.682	Y	0.233	Y

MLFT4	0.661	Y	0.439	Y	0.094	Y	0.237	Y	0.934	Y	0.503	Y
JFEN3	0.848	Y	0.611	Y	0.928	Y	0.625	Y	0.311	Y	0.893	Y
CTKA4	0.400	Y	0.682	Y	0.090	Y	0.049	N	0.027	N	0.447	Y
KEPL3	0.014	N	0.220	Y	0.014	N	0.741	Y	0.926	Y	0.007	N
KLBN3	0.155	Y	0.567	Y	0.571	Y	0.780	Y	0.452	Y	0.164	Y
KLBN4	0.998	Y	0.216	Y	0.590	Y	0.134	Y	0.053	Y	0.280	Y
LIGT3	0.930	Y	0.651	Y	0.451	Y	0.594	Y	0.933	Y	0.604	Y
LIXC3	0.936	Y	0.148	Y	0.687	Y	0.210	Y	0.250	Y	0.066	Y
LIXC4	0.411	Y	0.018	N	0.611	Y	0.163	Y	0.042	N	0.009	N
LAME3	0.877	Y	0.721	Y	0.706	Y	0.599	Y	0.185	Y	0.446	Y
LAME4	0.942	Y	0.767	Y	0.953	Y	0.458	Y	0.198	Y	0.697	Y
MGEL4	0.242	Y	0.008	N	0.753	Y	0.884	Y	0.217	Y	0.185	Y
POMO3	0.786	Y	0.233	Y	0.199	Y	0.449	Y	0.099	Y	0.696	Y
POMO4	0.835	Y	0.046	N	0.118	Y	0.386	Y	0.263	Y	0.851	Y
MEND5	0.067	Y	0.584	Y	0.469	Y	0.882	Y	0.508	Y	0.759	Y
MEND6	0.087	Y	0.642	Y	0.398	Y	0.733	Y	0.506	Y	0.855	Y
BMEB4	0.800	Y	0.141	Y	0.431	Y	0.771	Y	0.158	Y	0.939	Y
BMIN4	0.277	Y	0.985	Y	0.123	Y	0.598	Y	0.865	Y	0.163	Y
MTSA4	0.966	Y	0.297	Y	0.002	N	0.154	Y	0.129	Y	0.825	Y
MOAR3	0.602	Y	0.304	Y	0.904	Y	0.502	Y	0.614	Y	0.152	Y
MNDL3	0.212	Y	0.227	Y	0.290	Y	0.575	Y	0.196	Y	0.508	Y
NATU3	0.915	Y	0.336	Y	0.803	Y	0.552	Y	0.196	Y	0.085	Y
BNBR3	0.546	Y	0.296	Y	0.465	Y	0.798	Y	0.619	Y	0.711	Y
OIBR3	0.042	N	0.639	Y	0.031	N	0.816	Y	0.331	Y	0.638	Y
OIBR4	0.491	Y	0.865	Y	0.016	N	0.269	Y	0.070	Y	0.637	Y
PCAR4	0.581	Y	0.012	N	0.056	Y	0.349	Y	0.105	Y	0.393	Y
PATI3	0.799	Y	0.381	Y	0.899	Y	0.263	Y	0.845	Y	0.373	Y
PATI4	0.690	Y	0.315	Y	0.972	Y	0.092	Y	0.667	Y	0.592	Y
PEAB3	0.635	Y	0.059	Y	0.021	N	0.911	Y	0.004	N	0.714	Y
PEAB4	0.874	Y	0.377	Y	0.025	N	0.596	Y	0.032	N	0.500	Y
PMAM3	0.086	Y	0.416	Y	0.429	Y	0.947	Y	0.339	Y	0.098	Y
RPMG3	0.972	Y	0.234	Y	0.365	Y	0.194	Y	0.898	Y	0.353	Y
PETR3	0.229	Y	0.777	Y	0.032	N	0.554	Y	0.579	Y	0.376	Y
PETR4	0.077	Y	0.791	Y	0.075	Y	0.401	Y	0.844	Y	0.464	Y
PTNT4	0.767	Y	0.013	N	0.156	Y	0.767	Y	0.473	Y	0.276	Y
PSSA3	0.330	Y	0.060	Y	0.248	Y	0.337	Y	0.299	Y	0.588	Y
PTBL3	0.982	Y	0.670	Y	0.786	Y	0.227	Y	0.752	Y	0.572	Y
RADL3	0.482	Y	0.880	Y	0.278	Y	0.990	Y	0.230	Y	0.614	Y
RAPT3	0.939	Y	0.347	Y	0.326	Y	0.123	Y	0.932	Y	0.195	Y
RAPT4	0.729	Y	0.377	Y	0.257	Y	0.291	Y	0.516	Y	0.311	Y
RCSL4	0.211	Y	0.920	Y	0.006	N	0.469	Y	0.318	Y	0.582	Y
REDE3	0.439	Y	0.652	Y	0.239	Y	0.537	Y	0.832	Y	0.575	Y
REDE4	0.503	Y	0.135	Y	0.210	Y	0.799	Y	0.747	Y	0.612	Y

RSID3	0.191	Y	0.897	Y	0.797	Y	0.000	N	0.218	Y	0.004	N
SBSP3	0.327	Y	0.008	N	0.130	Y	0.109	Y	0.789	Y	0.975	Y
SAPR4	0.220	Y	0.195	Y	0.033	N	0.773	Y	0.831	Y	0.200	Y
SNSY5	0.766	Y	0.407	Y	0.392	Y	0.807	Y	0.314	Y	0.339	Y
CTSA3	0.002	N	0.375	Y	0.524	Y	0.004	N	0.208	Y	0.510	Y
CTSA4	0.001	N	0.657	Y	0.648	Y	0.263	Y	0.023	N	0.837	Y
SCAR3	0.151	Y	0.483	Y	0.008	N	0.633	Y	0.053	Y	0.364	Y
SLED4	0.107	Y	0.323	Y	0.278	Y	0.769	Y	0.713	Y	0.168	Y
SHUL4	0.030	N	0.014	N	0.154	Y	0.091	Y	0.120	Y	0.735	Y
CSNA3	0.084	Y	0.211	Y	0.540	Y	0.816	Y	0.432	Y	0.030	N
SOND5	0.685	Y	0.626	Y	0.493	Y	0.814	Y	0.914	Y	0.525	Y
SPRI3	0.594	Y	0.476	Y	0.784	Y	0.458	Y	0.287	Y	0.818	Y
SPRI5	0.943	Y	0.594	Y	0.729	Y	0.434	Y	0.570	Y	0.913	Y
SULT3	0.754	Y	0.947	Y	0.193	Y	0.972	Y	0.106	Y	0.700	Y
SULT4	0.614	Y	0.802	Y	0.333	Y	0.879	Y	0.081	Y	0.745	Y
SUZB5	0.196	Y	0.172	Y	0.001	N	0.543	Y	0.942	Y	0.223	Y
TCNO3	0.010	N	0.844	Y	0.802	Y	0.515	Y	0.819	Y	0.060	Y
TCNO4	0.041	N	0.593	Y	0.696	Y	0.993	Y	0.925	Y	0.191	Y
TOYB3	0.218	Y	0.425	Y	0.003	N	0.749	Y	0.228	Y	0.071	Y
TOYB4	0.295	Y	0.651	Y	0.037	N	0.892	Y	0.566	Y	0.349	Y
TEKA3	0.774	Y	0.105	Y	0.304	Y	0.452	Y	0.535	Y	0.949	Y
TEKA4	0.841	Y	0.202	Y	0.982	Y	0.539	Y	0.606	Y	0.854	Y
TKNO4	0.409	Y	0.008	N	0.810	Y	0.037	N	0.897	Y	0.800	Y
TELB3	0.886	Y	0.809	Y	0.755	Y	0.120	Y	0.536	Y	0.369	Y
TELB4	0.572	Y	0.986	Y	0.479	Y	0.108	Y	0.637	Y	0.455	Y
VIVT3	0.194	Y	0.556	Y	0.756	Y	0.844	Y	0.180	Y	0.904	Y
VIVT4	0.214	Y	0.699	Y	0.893	Y	0.600	Y	0.103	Y	0.682	Y
TXRX4	0.770	Y	0.793	Y	0.509	Y	0.917	Y	0.899	Y	0.644	Y
TIMP3	0.378	Y	0.495	Y	0.609	Y	0.482	Y	0.299	Y	0.456	Y
TBLE3	0.318	Y	0.209	Y	0.905	Y	0.128	Y	0.468	Y	0.340	Y
TRPL3	0.432	Y	0.857	Y	0.043	N	0.620	Y	0.329	Y	0.137	Y
TRPL4	0.703	Y	0.404	Y	0.343	Y	0.406	Y	0.050	Y	0.185	Y
TUPY3	0.239	Y	0.242	Y	0.617	Y	0.086	Y	0.758	Y	0.330	Y
UNIP3	0.498	Y	0.917	Y	0.712	Y	0.026	N	0.691	Y	0.260	Y
UNIP5	0.747	Y	0.705	Y	0.241	Y	0.030	N	0.209	Y	0.924	Y
UNIP6	0.522	Y	0.892	Y	0.857	Y	0.111	Y	0.789	Y	0.237	Y
USIM3	0.120	Y	0.244	Y	0.837	Y	0.290	Y	0.381	Y	0.311	Y
USIM5	0.053	Y	0.059	Y	0.779	Y	0.097	Y	0.226	Y	0.144	Y
USIM6	0.231	Y	0.015	N	0.490	Y	0.018	N	0.345	Y	0.214	Y
VALE3	0.334	Y	0.402	Y	0.056	Y	0.338	Y	0.052	Y	0.525	Y
VALE5	0.201	Y	0.372	Y	0.051	Y	0.435	Y	0.033	N	0.399	Y
WEGE3	0.407	Y	0.334	Y	0.524	Y	0.742	Y	0.876	Y	0.598	Y
MWET4	0.034	N	0.126	Y	0.811	Y	0.028	N	0.018	N	0.687	Y

International Journal of Management, Accounting and Economics
Vol. 4, No. 5, May, 2017
ISSN 2383-2126 (Online)

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WHRL3	0.821	Y	0.452	Y	0.007	N	0.121	Y	0.485	Y	0.441	Y
WHRL4	0.351	Y	0.399	Y	0.015	N	0.090	Y	0.945	Y	0.386	Y
SGAS3	0.213	Y	0.480	Y	0.603	Y	0.540	Y	0.088	Y	0.400	Y
SGAS4	0.163	Y	0.328	Y	0.747	Y	0.808	Y	0.110	Y	0.802	Y