

RELATION BETWEEN THE STOCK RETURN AND THE ENDOGENOUS VARIABLES OF LATIN AMERICAN COMPANIES FROM UTILITIES SECTOR

RELAÇÃO ENTRE A DEVOLUÇÃO DE AÇÕES E AS VARIÁVEIS ENDÓGENAS DE EMPRESAS LATINO-AMERICANAS DO SETOR DE UTILIDADES

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ABSTRACT

The main aim of this study is to analyze the relation of the endogenous variables, such as net margin (NM), gross debt (GD), Return of Assets (ROA) and current ratio (CR) with the stock return of Latin American companies from utilities sector. The research was based on annual data from 2010 to 2017 as well as on the application of multiple regressions. Results point to (i) a negative and significant relation to a 10% level with the gross debt difference (GDD) and (ii) to a significant and positive relation to 5% with the percentage variation of Current Liquidity (V% CL) with the stock return. Hypotheses 2 and 3 are confirmed into this research, what corroborates with the results of previous researches.

Keywords: Latin America, Endogenous Variables, Return of Assets, Panel Data.

1. INTRODUCTION

The evaluation models aim to demonstrate which ones will be the possible price variations of the actives in the market. Thus, there are two main criteria of analysis: the technical and fundamentalist. The first one seeks – through the market performance in previous periods – to plan the stock prices changes and the second one – through endogenous information – seeks a determined value for each stock (ASSAF NETO, 2011).

Thus, the return of assets is influenced by external factors, as changes on monetary policies by reducing interest rates and stimulating economic activity growth, as well as increasing / reducing population consumption (BLANCHARD, 2011). Assaf Neto (2014) states that internal factors end up influencing the stock return as profit per stock, ROE and ROA.

Several studies stood out the relation between stock return with endogenous variables, as profitability (e.g. KONIECZKA; ZAREMBA, 2015; CHEN, 2016; KUMAR 2017), net profit (e.g. BANNIGIDADMATH; NARAYAN, 2016; TSOULFIDIS; ALEXIOU; PARTHENIDIS, 2015; HINTERHUBER, 2016), liquidity indicators (e.g.

BERGGREN; BERGQVIST, 2015; CHUNG; ARIFF, 2016; LEIRVIK; FISKESTRAND; FJELLVIKÅS, 2017) *inter alia* (e.g. MIRZAEI; HAMIDIAN; VALAHZAGHARD, 2014; JEGADEESH; LIVNAT, 2006; MACHADO; MACHADO, 2014).

In addition, researchers reported the relation of the stock return with exogenous variables. Bannigidadmath and Narayan (2016) found a relation between profit and stock return on Indian stock market. Similarly, to Moura and Varela (2014), the sector of public utilities is important for the national economy. In other words, if we consider that when this sector has a proper structure, it not only enables the integration of national economy and population but also increases the gross domestic product (GDP).

Considering the importance of the utilities sector and endogenous factors, like accounting indicators on stock return for companies, this research aims to analyze the relation of the endogenous variables, such as net margin (NM), gross debt (DB), Return of Assets (ROA) and current ratio (LC) with the stock return (D(PRICE)), of Latin American companies of the utilities sector - which has the largest trading in B3 (Brazilian stock exchange) – in the fields of energy, water, gas and sanitation (B3, 2017).

2. THEORETICAL REFERENCES

Endogenous financial indicators not only show the reflects - or the performance - of the company in relation to the stock market but also founds the capacity of establishing conditions for the future market in order to determine which are the best decisions for the development of the company, in the search for the best results on stocks (ASSAF NETO, 2011).

Werneck *et al.* (2013) proposed a research about companies with stock traded on B3 market, with a time cutting from 1994 to 2006, through a fundamentalist analysis based on countable indexes to compare their power to predict abnormal returns. They used both Ohlson Residual Income Valuation model and the Piotroski R_score model. The first model resulted abnormal returns of 46.97% and 67.54% (what corresponds to first and second periods of analysis), while the second model 11.55% and 14%, respectively.

Biddle, Bowen and Wallace (1997) studied profit and Economic Value Added (EVA) associated to stock return. Results showed that profit is bigger than EVA, since

the operations cash and residual income do not explain the return but the profits. Rocha and Castro (2008) measured ROA, Ebtida and EVA with the abnormal return of Brazilian companies. The results with EVA did not indicate neither a significant relation in 10% with the abnormal stock return nor an explanatory power. In contrast, Costa (2015) found a significant and positive relation between the ROA and the stock return in 10% when they analyzed all the companies traded in B3, from 2010 to 2014.

Balachandran and Mohanram (2012) used the residual income and the invested capital as an explanation for the stock return, by showing that the increase of the residual income is positive, while the invested capital is negative, both in relation to the increase of the stock return.

In turn, Camargos, Camargos and Romero (2009) opted by the techniques of Traditional Financial Analysis and Dynamic Analysis to show each of them explains the financial variation through a ex post fact research, which used annual data of financial demonstrations. Results showed that both techniques, when used concomitantly, can explain stock return.

Considering the profitability, Konieczka and Zaremba (2015) studied the dividend yields using the transversal regression of Coca Cola European Partners PLC's stock market, showing a positive relation between dividends and stock return.

With respect to the relation between dividends and stock return, Abrokwa and Nkansah (2015) and Chen (2016) showed that a decrease on dividends resulted a decrease on stock prices (the same would happen with an increase). Accordingly, Kumar (2017) stated that the announcements of dividends in India from 2012 to 2014 interfered the stock prices.

Johnson *et al* (2011) – considering the indicators of indebtedness / leverage – highlighted that the price of actives influenced negatively the indebtedness. An (2011) analyzed 47 countries, showing a significant statistical evidence in relation to stock prices and financial leverage. Under the same perspective, Teng, Si and Hachiya (2016) related indebtedness to stock return, showing a positive relation among financial institutions in Japan. On the other hand, Mirzaei, Hamidian e Valahzacyhard (2014) investigated stock prices in Iranian banks, finding a negative relation between indebtedness and the prices of actives.

Bannigidadmath and Narayan (2016) assessed the predictability of stock return in India. Results seemed to be statistically significant, once the stock return

strongly influenced the profits. In Japan, Tsoulfidis, Alexiou and Parthenidis (2015) confirmed the relation between stock market and profits. Hinterhuber (2016) showed that the changes in stock returns have impacted the profit variations.

Mendonça Neto and Bruni (2008) studied 54 companies listed in B3 but did not find a significant relation (5%) between the profitability of shareholders' equity and stock return. Other research performed by Leirvik; Fiskerstrand; Fjellvikas (2017) pointed that there are no evidences between profitability of shareholders' equity and stock return in the Norwegian market from 1983 and 2015.

Assis (2015) also verified financial indicators of some companies from B3 (from 1996 to 2009) of whom the net margin result has a negative relation with the stock return at a significance level of 10%. Similarly, Soares and Galdi (2011) found a significant and positive relation between net and stock return from IBovespa market from 1995 to 2008, with exception of financial companies.

Berggren; Bergqvist (2015) showed a positive relation between liquidity indicator and stock return in 50 Swedish companies in a period of 5 years. Other similar researches focused on Asian banks showed this positive relation likewise (e.g., CHUNG; ARIFF, 2016).

Santana and Lima (2004) related Earning Before Interests, Taxes, Depreciation and Amortization (EBITDA) to the total return of shareholders, and from the 50 companies analyzed in 2002, EBITDA did not show a 10% significant relation with the stock return. Accordingly, Machado and Machado (2014) related the profit, cash flow, liquidity of the stock, EBITDA, to the stock return of the common and preferred Brazilian stocks. By using the Liu model, three factors and the CAPM model, authors showed the absence between EBITDA and profit, with the stock return.

There are other researches related to stock return in B3 companies with endogenous factors like accounting profit (e.g. PAULO; SARLO NETO; SANTOS, 2012), financial accounting indicators (e.g. TAFFAREL; CLEMENTE; SOUZA, 2011), or liquidity indicators, which is based on the literature on economic performance and liquidity (e.g. PEROBELLI; FAMÁ; SACRAMENTO, 2016) and other fundamentals not previously mentioned (e.g. COSTA JÚNIOR, NEVES, 2000).

3. METHODOLOGICAL PROCEDURES

This research has a quantitative approach, in which the variables passed through statistical tests, using data from 110 Latin America companies from Utilities

sector, seeking the possible relations between endogenous variables with the stock return. For Creswell (2014), the quantitative method is characterized by the use of statistical tools for the data treatment of the collected sample, in which the researcher formulates hypotheses and generalizes the information in relation to the population, thus obtaining the results.

According to the International Financial Reporting Standards (IFRS) (2017), the total convergence to IFRS was made in Brazil in 2010 and in Mexico, Argentina, Peru and Chile in 2012. Thus, the research used data after convergence.

The sample was intentionally performed, i.e., companies with data available in the Thomson Reuters Eikon database, following sector segregation proposed by the North American Industry Classification System (NAICS). The companies used for the study are 110 in total: 50 Brazilian, 16 Argentine, 26 Chilean, 16 Peruvian and 2 Mexican.

The variables used in this research counted on annual data. Through these bases, This research verified the possible relations of the endogenous variables of the companies with the stock return (D (PRICE)), through the hypotheses of Table 1.

Table 1: Hypotheses

Independent Variable		Explanatory Variable	Expected Relationship	Previous Works
D(PRICE)	H 1	ML - Net Margin	Positive	Soares e Galdi (2011) e Assis (2015)
	H 2	V%LC - Current Liquidity	Positive	Assefa e Mollick (2014); Berggren e Bergqvist (2015)
	H 3	D(DB) – Gross Debt	Negative	Menon (2015)
	H 4	ROA	Positive	Bannigidadmath e Narayan (2016); Costa (2015)

Source: Research data.

Initially, the descriptive analysis was calculated through measures of central tendency (median), dispersion and variability (amplitude and standard deviation). These can be sample and population measures, thus the statistic is a point estimator that can be generalized for a given population (ANDERSON; SWEENEY; WILLIAMS, 2013).

Afterwards, the multiple regression was performed, whose tests are presuppositions of multiple regression: (1) normality, (2) stationarity, (3) multicollinearity, (4) heteroscedasticity and (5) autocorrelation. For Normality, the Jarque-Bera test (HAIR et al, 2009) was performed. Regarding stationarity, the ADF test was used at a 5% level. The Variance Inflation Factor (VIF) test was also performed with respect to multicollinearity (GUJARATI, 2006; WOOLDRIDGE, 2013).

Multicollinearity is the relationship between the independent variables, and R^2 above 0.90 indicates strong evidence of multicollinearity (HAIR et al, 2009; SARTORIS, 2013). For homoscedasticity, the Durbin-Watson test was used (GUJARATI, 2006). Finally, the regression was estimated with White's covariance matrix for heteroscedasticity (GUJARATI, 2006; HILL; GRIFFITHS; JUDGE, 2006).

4. ANALYSIS AND DISCUSSION OF RESULTS

Table 2 shows the descriptive statistics, observing the variables of the study. It shows: (i) D (PRICE) obtained a 0,0016 average, (ii) the average of return of assets is 0.045, (iii) the net margin of companies from Utilities sector is 0.0793 and (iv) the gross debt, real interest rate and exchange rate showed high standard deviation.

Table 2: Descriptive Statistics

	Average	Maximum	Minimum	Standard Deviation
D(PRICE)	0,0016	1,014	-0,539	0,08
ML	0,0793	0,91	0,0001	0,46
V%LC	0,77	4,91	0,09	0,64
ROA	0,045	0,579	-1,094	0,097
D(DB)	10217902	1,02E+10	-3,57E+09	6,83E+08
D(ER)	0,28138	0,60266	0,00141	0,2021
D(GDP)	0,04703	0,32504	-0,26575	0,1424
IR	0,01143	0,07029	-0,1842	0,0486

Source: Research data.

After the descriptive analysis, we performed the estimations of the multiple regression assumptions with more than 100 observations, following the theorem of Central Limit, concluding that a sample with numbers greater than 100 is close to normality (GUJARATI; PORTER, 2011).

The variables of D(PRICE), MG, Current Liquidity (V% LC), Return of Assets, gross debt difference (GDD), gross domestic product (GDP) and IR are stationary at a 5% level by means of tests (i) Lm, Pesaran and Shin , (ii) Fisher-ADF and (iii) Fisher-PP. Soon after, the VIF (Variance Inflation Factor) test indicated no multicollinearity

(i.e., less than 10). Autocorrelation was evidenced by the Durbin-Watson test. In order to overcome the autocorrelation problem, GMM-AB estimation was adopted with a dynamic panel, robust for heteroscedasticity.

Table 3: Model – Dependent Variable: VARPA

Variables	GMM-AB (vec(robust))
D((VARPA)-1)	0,8624***
ROA	-0,0205
DB	-1,85e-12***
ML	0,0010
LC	2,34e-12
D(ER)	0,04916**
D(GDP)	-0,1114***
IR	0,2938***
Intercepto	0,8437***
Stat-Sargan	0,1368
AB - H0 - There is no autocorrelation at first-order	0,0655
AB - H0 - There is no autocorrelation at first-order	0,3950

Source: Research data.

Note: *, **, *** indicative of significance of 10, 5 and 1%, respectively.

Table 3 shows that the first and second order autocorrelation tests were performed, as well as Sargan test, pointing to the absence of restriction as mentioned by Arellano and Bond (1991). Regarding the results, the lagged variable (1 lag) presented a positive and significant relation to 1% with the stock price variation. With respect to endogenous variations, only a negative relation was evidenced at 1% level in relation to gross debt and stock return according to Menon (2015).

Returns of Assets, Liquid Margin and Current Liquidity did not present a 10% significant relation with stock return, what did not corroborate with the researches performed by Assefa and Mollick (2014), Assis (2015), Costa et al. (2015), Bannigidadmath and Narayan (2016) – possibly due to differences among the samples and periods of analysis.

In relation to exogenous variables, the positive and significant relation at 1% of exchange rate plus interest rate with stock return was evidenced, in accordance with Sousa et al. (2018). Gross domestic product and stocks prices variation showed a negative and significant 1% level relation.

5. FINAL CONSIDERATIONS

In view of the objective of the study - to analyze the relationship between the endogenous variables Net Margin, Gross Debt, ROA, Current Liquidity, and the stock return of companies in Latin America in the Utilities sector – there are some relations of endogenous variables found with stock returns.

Current Liquidity (V% CL) presented a positive and significant relationship at 5% level, corroborating with the research of Assefa and Mollick (2014) – performed with sixteen countries in the years 1995 to 2010. The gross debt presented a negative and significant relation at the level of 10% with the stock return, corroborating with Menon (2015), therefore, confirming hypotheses 2 and 3.

Liquid margin was not related to the expected signal, not corroborating with Soares and Galdi (2011), whose research showed a positive relation with the stock return, assessing Brazilian companies listed in B3. Finally, the ROA has no relationship with D(PRICE), thus not corroborating with the research of Bannigidadmath and Narayan (2015), carried out in India. Differences possibly justified by the different samples from the surveys.

The results can't be generalized in other sectors, or in capital markets from different countries, since each one has its peculiarity and the results are restricted to the public companies of Latin America. Thus, we suggest, according to the relation of the endogenous indicators with the stock return represented in this work researches focused on other sectors in the stock market that consider concomitantly endogenous and exogenous variables.

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