Analysis of the market value of public service companies in Brazil, Argentina and Chile: An application using panel data

Análisis del valor de mercado de las empresas de servicios públicos en Brasil, Argentina y Chile: una aplicación utilizando datos de panel

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Abstract

The proposed study analyzes the pricing of the market value of companies in the public utility sector in different scenarios. From the theoretical point of view, it is understood that the intention to invest in the business environment is facilitated when conditions in a country are favorable, as well as the financial health of companies. In this sense, the study incorporates economic and financial variables as predictors, in order to capture the effect and intensity in the pricing of market value. To achieve the objective, an econometric model was estimated from the organization of panel data, justified by the nature of the data. The results show that economic policies are decisive, but according to the scenario analyzed, the intensity and effects tend to change. Furthermore, financial information is relevant and must be incorporated by decision makers in the business environment.

JEL Code: B17; B27; M16
Keywords: company value; public services, South America; panel data

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Resumen

El estudio propuesto analiza el valor de mercado de las empresas del sector de servicios públicos en diferentes escenarios. Desde el punto de vista teórico, se entiende que la intención de invertir en el ámbito empresarial se facilita cuando las condiciones de un país son favorables, así como, por medio de la salud financiera de las empresas. En este sentido, el estudio incorpora variables económicas y financieras como predictores, con el fin de captar el efecto e intensidad en la cotización de precios del valor de mercado. Para lograr el objetivo se estimó un modelo econométrico a partir de la organización de datos de panel, siendo este justificado por la naturaleza de los datos. Los resultados muestran que las políticas económicas son decisivas y según el escenario analizado, la intensidad y los efectos tienden a cambiar. Además, la información financiera es relevante y debe ser incorporada por los tomadores de decisiones en el entorno empresarial.

Código JEL: B17; B27; M16
Palabras clave: valor de la empresa; servicios públicos, América del Sur; panel de datos

Introduction

The market value is a topic that always triggers discussion in the academic environment, even more so when talking about the determinants that can explain the intensity and variation depending on the scenario analyzed and the conditions that favor the policies of a country aimed at attracting both national and international capital. abroad. In this context, the public utility sector can be used as a strategy for those investors who aim to manage the risk-return relationship in the best way, considering that the utility sector is one of the least volatile given the importance of the sector in economies.

As a result, macroeconomic variables play an important role in serving as a basis for analyzing the market value of companies, citing variables such as Gross Domestic Product - GDP, exchange rate and interest rate, mainly. Thus, changes in monetary and exchange rate policy are crucial to explain the market value, which consequently influence economic activities. Namely, given the case of an expansive monetary policy, the tendency is to provide an increase in consumption and credit considering the expansion of the money supply (Blanchard, 2011).

In this context, studies such as those by Camara (2012) and Mokhova and Zinecker (2014) found a significant relationship and influence of macroeconomic variables such as: interest rate and income in the economy when analyzing the capital structure of companies. At the same time, Sánchez Arévalo & de Souza (2022) states that the capital structure of companies serves as a basis for discussing the solvency of companies, which, a priori, would help to price the market value of companies. Still talking about capital structure, financial variables that have a strong relationship to explain cash flow and EBTIDA are important to explain the market value of companies. At this point, investors' expectations and investment intentions depend on the information published by the companies, as well as the aggregation of value.

In this way, the incorporation of financial variables in the study is of total relevance which helps to contemplate both the performance of the company, and added to that, the performance of the economy with macroeconomic variables to explain the value that the market prices for the companies. When talking about financial variables, Malta and Camargos (2016) found eight variables with explanatory power of shares, which are: Return on Assets - ROA, on Investment - ROI, on Equity - ROE, Earnings per Share - LPA, Market- to-Book Ratio - MBR, Market Liquidity - INEG, Gross Margin - MB and Third-Party Capital Participation - PCT. In addition, given the scenarios proposed in this study, Argentina, Chile and Brazil, which are countries with different realities, different effects can be expected from macroeconomic variables, mainly (Lucey & Zhang, 2011; Kayo & Kimura, 2011).

Along these lines, given the observed reality of each of the countries under discussion, the incidence of coefficients for macroeconomic variables, for example: interest rate and exchange rate, may be greater considering the effect of monetary and exchange rate policies with greater variance in in relation to Chile. A relevant factor, it was observed in Argentina that the interest rate in 2018 reached 80%, with inflation of 47.6% (BCRA, 2019). In addition, economic income (GDP) in countries such as Brazil and Argentina shows moments of growth, deceleration and recession, whereas in the case of Chile, the GDP performance is more stable and growing over the time studied.

Regarding the public utility sector, it is understood that it is a defensive sector within the stock exchange, since companies offer an essential service to the population. Thus, even in periods of crisis or any systemic event affecting the business environment, the population will continue to consume water, energy and need basic sanitation. Consequently, it is to be expected that the sector under study will end up offering a good predictability in its revenues, implying the payment of dividends. In the meantime, some risks must be considered, many of these companies are state-owned, being susceptible to the risk of government intervention.

Based on the above, the objective of the study is to analyze the effect that macroeconomic and financial variables have on the market value of companies in the public utility sector in Brazil, Argentina and Chile in the period from 2010 to 2019. The macroeconomic variables are GDP, interest rate, exchange rate, return on equity - ROE, gross profit and financial slack (Peixoto & Alves, 2015; Paredes & Oliveira, 2017; Assefa; Esqueda & Mollick, 2017; Kumar, 2017; Picolo et al., 2018). The choice of countries is due to the fact that they are considered the most relevant in terms of representation in the South American scenario. In the case of Brazil and Argentina, for having the highest GDPs in the region and in the case of Chile for presenting one of the highest growth indicators in the period studied.

In addition, the study aims to fill the existing gap around the importance of the public utility sector as an attractive sector in the business environment, as well as less risky in crisis situations. In view of this, other countries such as Argentina and Chile are incorporated, in order to portray the importance

of the study in countries that have a growth pattern similar to that of Brazil. For this, it is considered that both Brazil, Argentina and Chile present a pattern of sustained growth in household consumption, representing approximately 60% of the GDP of the three countries (IBGE, 2022). A detailed description of the study problem can be seen in figure 1, where the relationship between the so-called determinant variables to explain the market value of companies is observed. Also, studies are cited that serve as a theoretical basis to support the incorporation of variables in the discussion of the problem and the hypotheses described in the methodology.
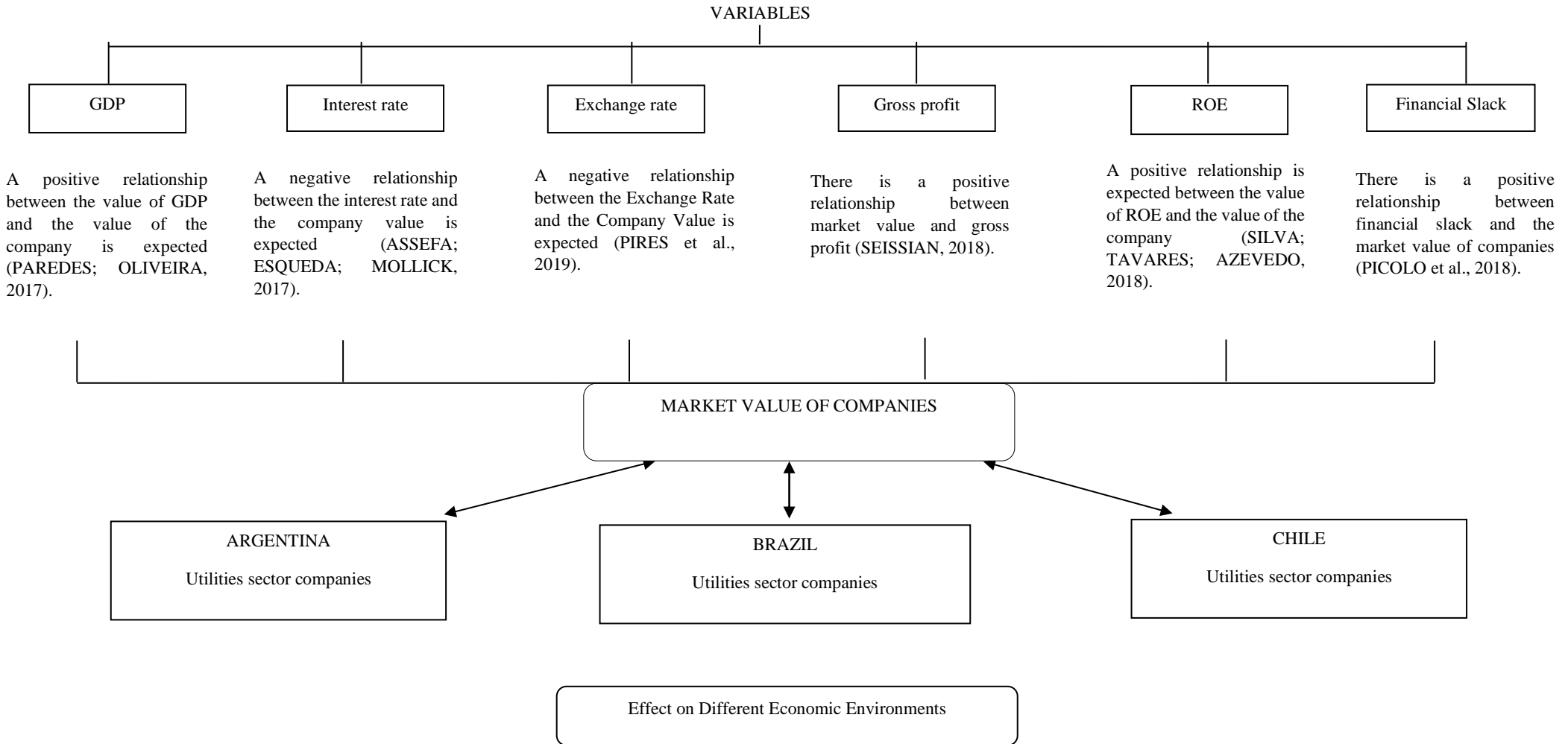
VARIABLES

GDP	Interest rate	Exchange rate	Gross profit	ROE	Financial Slack

A positive relationship between the value of GDP and the value of the company is expected (PAREDES; OLIVEIRA, 2017).

A negative relationship between the interest rate and the company value is expected (ASSEFA; ESQUEDA; MOLLICK, 2017).

A negative relationship between the Exchange Rate and the Company Value is expected (PIRES et al., 2019).

There is a positive relationship between market value and gross profit (SEISSIAN, 2018).

A positive relationship is expected between the value of ROE and the value of the company (SILVA; TAVARES; AZEVEDO, 2018).

There is a positive relationship between financial slack and the market value of companies (PICOLO et al., 2018).

MARKET VALUE OF COMPANIES

ARGENTINA	BRAZIL	CHILE
Utilities sector companies	Utilities sector companies	Utilities sector companies

Effect on Different Economic Environments

Figure 1. Conceptual research guiding model
Fonte: Authors

Theoretical review

The economy's income and macroeconomic variables

Among the several variables that can explain the behavior of the market value of publicly traded companies, there is the economy's income. Namely, the income of the economy, a priori, is understood to have a close relationship with the Stock Exchange indicator, considering that investments and the flow of money in general are channeled through the financial market (Sánchez Arévalo & de Souza, 2022).

In addition, as they are companies focused on the public utility sector, the service provided directly affects household consumption and, consequently, the income of the economy. In this way, the question of discussion derives from the relevance that household consumption has in GDP, and in the three objects of study, household consumption represents approximately 60% of GDP, that is, it is a major engine of the economy.

At this point, an aspect to be observed is the cycles that the economy's income can present and that, depending on the movement of the series, they can present structural breaks which can be decisive in the direction and the effect that the economy's income can have on the market value of companies. For the range under study, this aspect is not observed (see figure 2), although in the case of Brazil there is a tendency for income to fall at dollar prices.
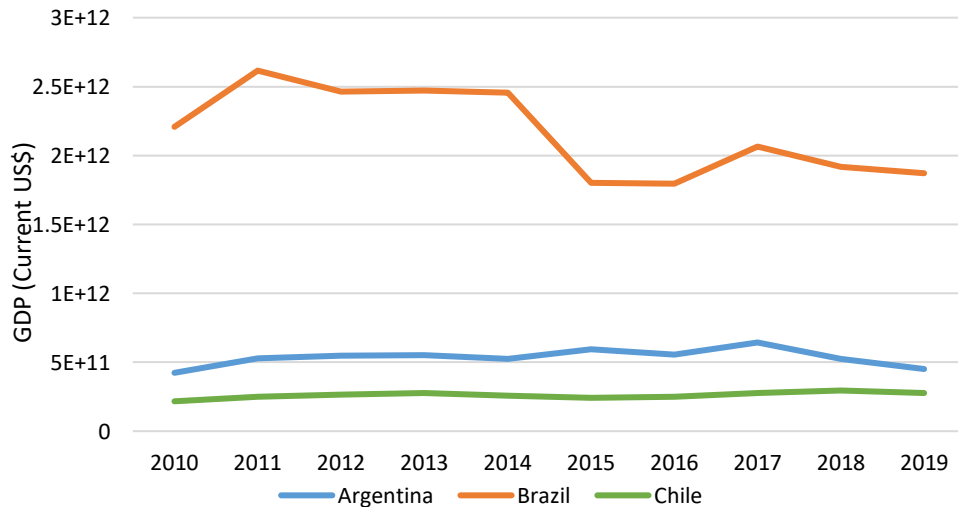

Figure 2. GDP of the countries of Brazil, Argentina and Chile
Source: World Bank (2022)

In the Brazilian scenario, Paredes and Oliveira (2017) found influence on market value when considering the effect of GDP, the economy's basic interest rate, inflation and exchange rate in the steel, financial, construction and electricity sectors. Thus, in the study proposed here, a positive relationship is expected between the income of a country's economy and the market value of companies, since income generation in the economy reflects the growth of productive sectors.

In the case of the exchange rate, transactions carried out with the foreign market influence the economic activities of companies, mainly in the export sector. When there is a devaluation of the local currency, exporting companies tend to obtain greater gains (Pires, 2019). In a study by Silva, Coronel and Vieira (2014), when analyzing the exchange rate and the Ibovespa index, they found a negative relationship between the exchange rate and the unidirectional index. That is, the exchange rate has an impact on the determination of the Ibovespa index. Thus, it appears that the exchange rate is a predictive potential of the index.

At this point, attention is drawn to the great loss of purchasing power of the Argentine domestic currency (see figure 3) and, as a result, the observed trend should be treated with caution, since it should exert a great influence on the market value of companies. In the Chilean case, the exchange rate fluctuation margin was smaller when compared to the Brazilian real, for the Chilean peso the quotation between 2010 and 2019 was from 510 to 702 Chilean pesos per dollar and, in the Brazilian case, it was from 1.75 to 2019. 3.94, in short, the Brazilian real lost more purchasing power than the Chilean peso. (World Bank, 2022).
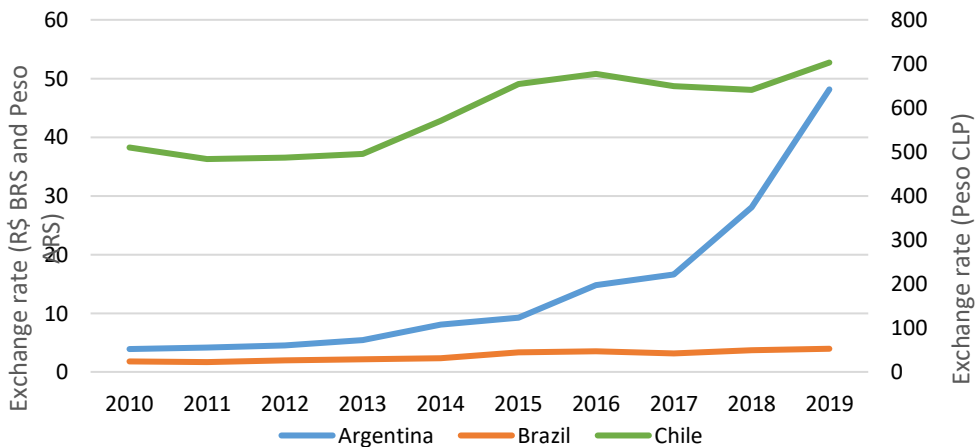

Figure 3. Exchange rate in the countries of Brazil, Argentina and Chile. Domestic currency against the dollar. Source: World Bank (2022)

On the interest rate side, Assefa, Esqueda and Mollick (2017) found a significant negative relationship with the share price. In this study, a universe of 21 developed and 19 developing countries was analyzed, being treated with panel data with a quarterly frequency, from 1999 to 2013. The findings of this study are corroborated by the literature, since the increase in the interest rate increases the opportunity cost of investing in fixed income, which leads to an expected reduction in demand for variable income.

Furthermore, in the case of interest rates, it is understood that this is a very important variable when it comes to controlling or expanding the money supply. Depending on the type of policy adopted by each country and depending on the economic scenario, its adoption has a direct effect on the value of the company, as all companies in the financial system are financed by the basic interest rate of the economy. The decrease in the interest rate causes an increase in companies' investments, consequently, in the short and medium term, the company's value tends to be maximized (Paredes & Oliveira, 2017; Bernardelli & Bernardelli, 2016).
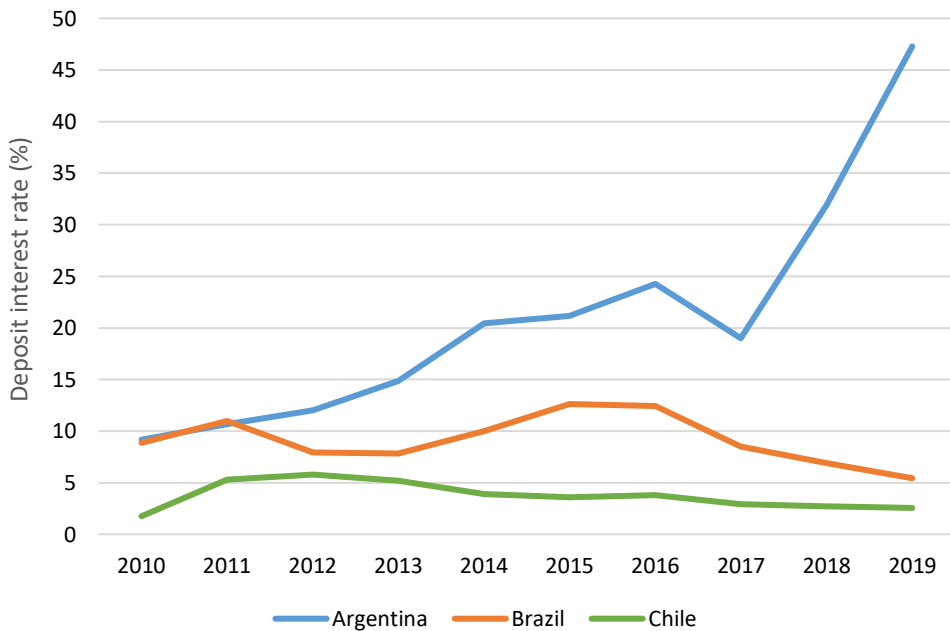

Figure 4. Interest rate on bank deposits in the countries of Brazil, Argentina and Chile
Source: World Bank (2022)

The figure 4 shows the behavior of the interest rate on bank deposits for the three countries that are the object of study. The accentuated trend of the series for the Argentine case can be clearly seen, this behavior being the result of the policy adopted by the Argentine Central Bank as an attempt to control inflation (considered one of the highest in the world) and stabilize the exchange market. In the Brazilian case, between 2010 and 2019, the interest rate dropped from approximately 8.87% to 5.43%, and in the case of Chile, it increased from 1.75% to 2.54%. These last two countries present a totally different reality when buying monetary policies, as well as the exchange market.

In addition, and emphasizing the importance of macroeconomic variables as determinants in the pricing of market value of companies, Bernardelli and Bernardelli (2016), highlight in their study that the economy's income, the interest rate and the exchange rate are the greater effect on the value of companies. Based on this, in this proposed study, it is necessary to verify whether the findings by these authors can be corroborated when we analyze different economies.

Relationship between market value and financial variables

The financial indicators play an important role in the relationship with the value of the company, as they are part of the management process of an entity. As relevant variables in this context, we consider profit, profitability, as well as the capital structure, signaling the financial slack. The latter can be understood as liquidity, and both slack and profitability are factors that make companies stand out (Rezende & Macedo, 2021; Picolo et al., 2018).

In the case of the sector under study, a priori, as they are companies that provide public service and have a niche of activity, profitability must be a factor linked to the company, that is, already expected by investors, on the other hand, the question that remains is to analyze the degree of commitment of equity capital. It is worth reflecting that in many of these companies the government's participation is very large, which in some cases, depending on the decisions, exerts a positive or negative influence on the business environment and, consequently, on the attractiveness of the capital market as a source of financing for economic activities.

Still talking about profitability and profit, Silva, Tavares and Azevedo (2018), verified the existence of a significant and positive relationship between ROE and the capital structure and with the market value for companies listed on the Brazilian Stock Exchange B3. Agrawal, Mohanty and Totala (2019), found a strong relationship between the return on shares arising from the ROE variable with the market value of companies, this study incorporated 1700 Indian companies listed on the National Stock Exchange - NSE and Bombay Stock Exchange - BSE, being the time of study from 2001 to 2016.

Also, Hahn et. Al. (2010) found a causal relationship between the share price and the payment of dividends; it should be noted that the payment of dividends is linked to earnings. This behavior reinforces the investor's preference for dividends, which does not rule out the importance of capital gains through the appreciation of stock prices. In addition, the conclusion brought by the author corroborates the causal relationship between the disclosure of information with the pricing of stock prices and, consequently, the market valuation of companies.

Along the same lines, Abrokwa and Nkansah (2015) found that dividends per share have a predictive effect on stock returns, although other variables such as earnings per share, company size and book value per share were incorporated in the study. Another study, such as the one by Forti, Peixoto and Alves (2015), found a significant positive relationship between the variables return, company size and profit growth, with the distribution of dividends with the market value of companies. These authors reinforce that, regardless of the dividend distribution policy, earnings growth is linked to greater earnings distribution, consequently, dividend distribution announcements help to positively price the value of companies.

Finally, market value is also influenced by factors that measure the level of profitability, risk and opportunity for growth, which are directly related to the level of indebtedness, the latter of which determines the financial slack of companies (Pamplona, da Silva & Nakamura, 2021; Rodrigues dos Santos, & Dos Santos, 2020). In addition, specific factors of the sector in which companies operate cannot be neglected, such as the importance of the sector and the sensitivity that it can present in the face of economic cycles.

Methodology

The panel data model

The panel method is an alternative methodology when the data used are the result of a combination of time series with a cross section. The advantage of using the methodology on screen, in addition to the efficiency with the information, is to obtain a greater number of degrees of freedom, which allows improving the degree of fit of the model and the statistical significance of the parameters. Therefore, the effects not observed in a cross-section or in a time series can be detected using a panel (Gujarati & Porter, 2011; Greene, 2011).

Fávero et al. (2009), highlights that the Pooled Effect is the simplest in relation to the Fixed and Random Effect methods, as it does not consider the specific effects of each company. The Fixed Effect, on the other hand, considers the specific aspects of each company, that is, individual heterogeneity, but

does not vary over the period, generating high variances, which correspond to the low variability of explanatory factors, i.e., period (Grenne, 2011). The Random Effect model considers the variations for each period of time analyzed and for each company, also called the error correction model, as different from the other two methods, it disaggregates the components into individual variations and variations in the period (Gujarati & Porter 2011; Fávero et al., 2009).

To contrast the Pooled method, fixed and random effect, the following tests are used: the Hausman, Chow and LM Breush-Pagan tests. Grenne (2011), argues that through the Hausman test, a comparison is made between the Fixed and Random models, great differences between these models, suggesting the inconsistency of the Random Effect estimators. The Chow test follows the same principle, but it compares the Pooled effect with the Fixed Effect, checking if there is consistency in the Pooled, if not, H0 Pooled is rejected. In the Breush-Pagan test, the Pooled Effect model and the Random Effect model are compared, if the variance of the intercept error term (u) is constant, it does not reject H0 Pooled, otherwise, if it is not constant, rejects H0.

Thus, if we have the following equation of the panel study model, which was proposed in the research, and based on what was discussed, considering the Pooled effect, we have the following formula:

$$ln\,VME_{it} = \alpha + \beta_1 lnPIB_{it} + \beta_2 lnTXJ_{it} + \beta_3 lnTXC_{it} + \beta_4 lnLRB_{it} + \beta_5 lnROE_{it} + \beta_6 lnFF_{it} + u_{it}$$

(1)

Thus, following equation 1, the model to be measured has the following variables, as previously described:

Wherein:

Ln_VME = Market value, determined by the total number of shares traded times the share price;

Ln_GDP = Gross Domestic Product (income proxy);

Ln_TXJ = basic interest rate of the economy;

Ln_TXC = exchange rate of domestic currency against the US dollar

Ln_LRB = Gross Profitability;

Ln_ROE = Return on Equity, and;

Ln_FF = Financial slack.

Regarding the variable "Company's market value", Medrado et al. (2016) highlights that it can be obtained by multiplying the company's share price by the number of company shares. It should be noted that this assessment is restricted to publicly traded companies and serves to assess how much the market is paying for a particular company. However, the investor should not confuse this value with the company's fair price or with the company's equity.

In order to verify relationships with the dependent variable "Market Value of Companies - VME" and the independent variables, as well as justify the expected sign of the coefficients in light of the estimation of equation 1, Table 1 details the hypotheses and signs expected. It is worth mentioning that, due to the fact that different countries are being analyzed, some coefficients may show signs contrary to what was expected, for which it will be necessary to verify the necessary justifications.

Table 1
Hypotheses and justification of the results.

Dependent Variable	Independent variables	Hypotheses		Justification
VME	GDP	H_A	+	Non-controllable risk - Bernardelli and Bernardelli (2016), the increase in GDP, is linked to the increase in the production of goods and services by companies. Expected results as found (Khan; Siddiqui, 2017).
	TXJ	H_B	-	Non-controllable risk - Gertler, Hubbarde Kashyap (1990), the increase in interest rates causes lower investments, consequently decreasing the company's value. Expected results as found (Assefa; Esqueda; Mollick, 2017).
	TXC	H_C	-	Non-controllable risk - Pires (2019), the appreciation of the foreign currency, tends to have a devaluation of the local currency. Expected results as found (Silva; Coronel; Vieira, 2014).
	LBR	H_D	+	The profit and profitability help to price the market value of companies (Seissian; Gharios & Awad, 2018). Positive relationship must be observed through the coefficient linked to this variable (Rezende & Macedo, 2020)
	ROE	H_E	+	Controllable risk - Assaf Neto (2014), points out that ROE, directly affects the return of the stock, consequently, the company's market value. Expected results as found (Silva; Tavares; Azevedo, 2018; AgrawaL; Mohanty; Totala, 2019).
	FF	H_F	+	The Financial slack is a resource used to generate opportunities and a high level of it can lead to more efficient management and, consequently, help to price the market value of companies (Picolo, et al, 2018; Rezende & Macedo, 2020).

Source: Research data.

Source and treatment of data

Data on the value of the company, as well as the financial indicators of profitability, gross profit and financial slack were collected on the platform Economática and Thompson Reuters. The universe of data collected starts from 2010 to 2019, with quarterly series. To estimate the results, the company value collected at current price was deflated using a broad correction indicator for each country under study.

The same correction procedure (inflation adjustment) was performed for GDP, the exchange rate, the basic interest rate of the economy. The data for these variables were collected together with information published by the Central Bank of each country under study, in the case of Brazil BACEN - Central Bank, in the case of Chile BCENTRAL - Central Bank of Chile and, in the case of Argentina BCRA - the Central Bank of the Republic of Argentina. In total, data from 12 companies in Chile, 10 from Argentina and 39 from Brazil were analyzed with all the information available for the study.

Discussion of results

Results for Brazil

The table 2 shows the result of the estimation of equation 1 for Brazil. From the result of the Hausman test, it is concluded that the fixed effect is better than the other approaches. Through the fixed effect, we can say that there are unobserved and heterogeneous characteristics for each individual that are related to the explanatory variables. Consequently, it is assumed that the individual components are not correlated with the explanatory variables.

Table 2
Result of the Estimation of Equation 1 defined for Brazil.

Variables	Random Effect	Fixed Effect	Pooled
GDP	0.6421**	0.6476**	0.8581***
	(0.2881)	(0.2889)	(0.2543)
TXJ	-0.3622***	-0.3651***	-0.7547***
	(0.0921)	(0.0927)	(0.1243)
TXC	-0.3913**	-0.3987**	-0.5741***
	(0.1791)	(0.1799)	(0.0973)
Gross profit	0.1345***	0.1343***	0.9347**
	(0.0231)	(0.0236)	(0.4507)
ROE	0.2471	0.2452	0.3155**
	(0.3844)	-0.3871	(0.1481)
Financial slack	0.7113***	0.7322***	0.5152**
	(0.2191)	(0.2108)	(0.2351)
Constant	23.3712**	23.3931**	12.1027***
	(9.0522)	(9.8105)	(3.1964)
R^2	0.5973	0.5749	0.6296
F test			31.19***
Chow test		244,23***	
Hausman test		3.972**	
BP Lagrange test	19,645.69***		
N	1,560	1,560	1,560

Source: Research results.

*** significant at 1%, ** significant at 5%, * significant at 10%.
GDP = Deflated GDP,
TXJ = SELIC interest rate, deflated,
TXC = US dollar / Brazilian real exchange rate, deflated

Regarding the sign of the coefficient linked to the GDP variable, the variation in the economy's income implies a variation in the same direction for the market value of the companies under study. Namely, the sector in question, as it is a public utility, corroborates the hypothesis that it is important for the economy and, even in crisis situations, it will hardly be affected to a great extent, implying the possibility of observing robust structural breaks.

Continuing, the negative coefficient of the TXJ variable denotes those monetary policies are relevant in pricing the market value of companies in the sector studied. At first, it can be understood that monetary policy decisions made by the Central Bank initially affect the business environment, influencing short-term decisions by investors. In this case, it appears that the intensity of the effect is three times, given a change of 1% in the interest rate, the market value of companies tends to fall by approximately 3.6%.

On the side of the TXC exchange rate, there is an effect similar to that observed in the previous coefficient. Evidently, exchange rate policies, as well as the very condition of the market that price the purchasing power of domestic currency, are determinant in the value of the company. At this point, the information that must be incorporated by decision makers is that the effect of monetary and/or exchange rate policies has similar intensities for the public utility sector in particular. When considering the Brazilian economic environment, the country suffered over the period under study, increasing increases in the exchange rate and given the loss of purchasing power of the domestic currency, what would be expected would be a fall in the value of these companies.

In the case of Gross Profit, ROE and financial slack, these three variables reflect the importance of financial information as fundamental in the investment intention, as well as in the aggregation of value by the company, which reflects in the pricing that the market makes on the value from the company. In this sense, given the positive sign of the coefficients, a priori, it is understood that the market value tends to increase in the face of positive variations in these financial indicators. At this point, it is important to emphasize the importance of financial slack and, therefore, of the formation of the capital structure of companies and to verify to what extent the debt commitment becomes relevant. For the specific sector, the financial slack reflects, among other aspects, the company's ability to deal with short-term debts making use of available and realizable, in general, the debt does not cover a higher percentage of equity in relation to the structure of companies.

Results for Argentina

In the table 3 shows the result of the estimation of equation 1 for Argentina. As in the Brazilian case, the result of the Hausman test concludes that the fixed effect is the best to the detriment of the other approaches. In this sense, interpretation and discussion of the results will follow the order of the coefficients found through the fixed effects.

Table 3
Result of the Estimation of Equation 1 defined for Argentina.

Variables	Random Effect	Fixed Effect	Pooled
GDP	0.4754	0.5937	0.7983
	(0.2935)	(0.4867)	(0.9721)
TXJ	-1.3362***	-1.4377***	-2.0213***
	(0.2401)	(0.2504)	(0.2717)
TXC	1.6743***	1.7645***	1.4593***
	(0.4201)	(0.6598)	(0.4744)
Gross profit	1.9691**	1.9809**	2.1817**
	(0.8734)	(0.8702)	(0.9206)
ROE	0.0763	0.0723	0.0274
	(0.1181)	(0.1107)	(0.0562)
Financial slack	0.2381	0.2351	0.3276**
	(0.1897)	(0.1842)	(0.1243)
Constant	3.9927	3.7961	3.7755
	(4.9424)	(4.0133)	(9.4122)
R^2	0.6721	0.6793	0.7652
F test			27.14***
Chow test		458.92***	
Hausman test		2.455**	
BP Lagrange test	7109.52***		
N	400	400	400

Source: Research results.
*** significant at 1%, ** significant at 5%, * significant at 10%.
GDP = Deflated GDP,
TXJ = basic interest rate of the Argentine economy (LELIQ), deflated,
TXC = US dollar / Argentine peso exchange rate, deflated.

With regard to GDP, it can be seen that positive variations are followed in the same direction by the company value, although it is not statistically significant, this result brings a good reflection on the matter. In general, as it is a strategic sector, a priori it is understood that the public utility sector behaves similarly to the performance of the economy. At this point, it is worth mentioning the effect of price control policies carried out in that country, considering the economic instability given the increase in poverty levels, which weakens the market value of these companies.

In addition, another factor worth mentioning is related to the monetary policies adopted in Argentina. During the study period, it was found that interest rates in Argentina rose significantly, and

this measure was adopted with the aim of controlling inflation. The high rate of inflation actually weakens the purchasing power of the domestic currency, which consequently affects the market value of the companies under study. At this point, the sign of the TXC exchange rate coefficient stands out, which does not corroborate the expected. Due to the positive sign of TXC, the company value increases as the domestic currency depreciates against the dollar.

These last two results deserve a reflection, on the one hand it is understood that the restrictive monetary policy tends to curb inflation through a lower expansion of the money supply, however in the Argentine case this reality was not the expected and the domestic currency continued to lose purchasing power. At this point, a much-commented aspect in the business environment centers on the loss of confidence among international investors related to the government's ability to meet all debt payments. Thus, given this reality, it was expected that the exchange rate coefficient would follow the behavior of monetary policy, with a negative sign.

Regarding the coefficients of the variables Gross profit, ROE and financial slack, the signs are expected and denote the importance of the fundamentals of the companies in the sense of pricing the market value of the companies. As they are companies operating in an important sector of the economy, it was expected that the profitability, profit and ability of companies to meet their short-term obligations are determining variables, although only the gross profit has a statistical and significant argument. Still related to fundamentals and specifically ROE profitability, a positive relationship was to be expected, although the coefficient is not statistically significant, important conclusions can be drawn considering that profitability plays a key role in attracting investments.

Results for Chile

For the Chilean case, the results can be seen in Table 4. Initially, it is worth mentioning that the interpretation of the results follows the estimation of fixed effects considering the result obtained by the Hausman test. Thus, it is considered that the coefficients incorporate heterogeneous information within the universe of companies studied, which makes the interpretation of the results found plausible.

On the GDP side, there is a positive relationship between income and the market value of companies, although not statistically significant. This initial result encourages a reflection on how important the performances that public utility companies have in the Chilean scenario can be to explain the behavior of the economy's income. Although it is a strategic sector for serving public services and the Chilean economy is one of the most stable for the time being studied, a positive and significant statistical relationship was expected. The balance that can be made in the light of the result found concerns the loss

of market value of some companies that are the object of study, with behavior different from that of the economy, and in the period under study the Chilean GDP had one of the best performances of the region.

Table 4
Result of the Estimation of Equation 1 defined for Chile.

Variables	Random Effect	Fixed Effect	Pooled
GDP	0.0236	0.0246	0.09835**
	(0.0773)	(0.0793)	(0.0345)
TXJ	0.2109*	0.2254*	0.5408***
	(0.1227)	(0.1142)	(0.1009)
TXC	0.4587***	0.4488**	0.2235*
	(0.1437)	(0.1568)	(0.1151)
Gross profit	1.2276***	1.2245***	1.9761**
	(0.2117)	(0.2234)	(0.8643)
ROE	1.4217*	1.3298	4.3219
	(0.7788)	(0.8776)	(2.7828)
Financial slack	0.2981	0.2792	1.2308
	(0.2341)	(1.2907)	(2.3109)
Constant	9.6375***	9.2245***	6.7801**
	(2.4982)	(2.3872)	(3.0193)
R^2	0.4973	0.5032	0.5564
F test			19.72***
Chow test		2377.14***	
Hausman test		3.291**	
BP Lagrange test	7944.008***		
N	480	480	480

Source: Research results.
*** significant at 1%, ** significant at 5%, * significant at 10%.
GDP = Deflated GDP,
TXJ = basic interest rate of the deflated Chilean economy,
TXC = US dollar / Chilean peso exchange rate, deflated.

In relation to the TXJ coefficient, the result denotes a positive relationship, contrary to what was expected in the light of the theory. However, it is worth pointing out some aspects of the Chilean economic reality that may help to explain this finding, which is related to economic stability, as well as the intensity of the interest rate variation. It should be noted that a brief analysis of the interest rate trend in Chile indicates a stable behavior over the analyzed period. Thus, in a country with a controlled level of inflation and an almost constant interest rate, the effect on the value of companies tends to be positive and companies are encouraged to obtain financing without greater risks.

Linked to this behavior, there is a positive result of the coefficient of the TXC exchange rate, in such a way that the devaluation of the domestic currency against the dollar would imply in a greater value of the companies. A justification for this result can be explained by the social and political uncertainty that took shape in 2019, through the protests in October of that year, which devalued the purchasing power of the domestic currency. Additionally, according to the Central Bank of Chile (2019), this country has a

solvent financial system, a solid fiscal situation and inflation expectations around 3%, with monetary policy adapting to these circumstances. Thus, although the domestic currency loses value, there is a whole context of information that the business environment incorporates and that implies the value of companies.

Looking at the financial information, the intensity of the Gross Profit and ROE coefficients draws attention, although the results show no statistical significance, important conclusions can be drawn from this information. In the business environment, decision makers need to incorporate information into their decisions to help them choose the best path. In the case of gross profit, this can represent a competitive advantage as a particular company incorporates a higher volume when compared to other companies in the same sector. In addition, gross profit as well as the result of profitability may indicate a competitive advantage in product costs due to efficient production techniques or economies of scale. In general, for the Chilean case, decision makers must incorporate as relevant information the information of the companies, such as fundamentals, and secondly, the main macroeconomic variables of the country.

Final considerations

Through this study, we sought to analyze how macroeconomic and financial variables can explain the value of public utility companies in different scenarios, with the countries of Brazil, Argentina and Chile being the object of study. The choice of the countries under study is justified, on the one hand, by the representation that the countries of Brazil and Argentina have in terms of GDP in South America and, in the case of Chile, for being the country with one of the best indicators in terms of growth and development in the region.

It is worth noting that different results were observed according to each country under analysis, for which decision makers should incorporate them according to the priority observed in this study. In the Brazilian case, the monetary and exchange rate policies that this country may experience are considered as priority information, which, in short, are seen as determinants of the value of companies for the sector under study. Namely, for the time being studied in Brazil, the basic interest rate of the economy had large fluctuations, as well as the domestic currency lost value against the dollar.

Specifically, between the pre- and post-World Cup years, Brazil experienced one of the highest interest rates in history and, in the light of economic theory, the high interest rate keeps the economy with a low growth rate and low investment rate, which in in the case of the Brazilian economy, this has resulted in a regression of the production matrix, reflecting, among others, in the economy's GDP between 2015 and 2016. Still in the Brazilian case, the financial slack is considered a very important information to be incorporated by decision makers, that is, it is worth reflecting on the capital structure and the solvency level explained by the companies' ability to pay short-term debts.

In the case of Argentina, monetary policies and exchange rate policy are also decisive in the context of the study. At this point, something that stands out is the balance that these two policies make in controlling the market value of companies, if on the one hand a restrictive monetary policy would tend to negatively affect the market value, on the other hand, the loss of power of purchase of the domestic currency against the dollar raises the market appreciation of companies in this sector. Namely, the volatility of the market, the policies adopted in order to curb the exchange rate and the effect that these measures have on the liquidity of the depriving sector and on the entire business environment, create situations that can lead to a paradox.

Still on the Argentine market, on the GDP side, although a positive relationship is observed, but not statistically significant, the characterization of the economic context can justify this result. The Argentine economy is characterized by an underdeveloped financial market and a volatile macroeconomy, although public utilities are considered to play a fundamental role in promoting productive sectors that are strategic for the country's growth.

On the Chilean market, there is a different behavior, which is reflected in highlighting the exchange rate, on the macro side, as more relevant in terms of intensity to explain the market value of companies, although with a sign contrary to what was expected, being a behavior similar to that observed in Argentina. It remains as a reflection, to what extent the policies adopted aimed at raising the interest rate, which values the exchange rate, favor or not the control of inflation, and what are the effects on the price index and, if there is a pass-through (effect causal) for basic services. An important piece of information that should be included in this discussion is related to the price control of basic services, something signaled by the government in charge in 2019, which would tend to be one of the measures to stop the social protests that year, in order to alleviate visa cost and inequality.

Regarding the financial information, the relevance of gross profit was verified with significant statistics and positively affecting the market value. However, in terms of intensity, ROE profitability incorporates relevant information, although the coefficient is not significant. In this way, the argument that financial information and especially profitability is important is reinforced, however, although the sector under study is focused on analyzing a strategic sector of the economy, the macroeconomic context appears to be relevant. Consequently, it is recommended that future studies include a variable that measures the market value through the indicator or sub-indicator of freedom, considering that this index incorporates social, economic and political information.

Finally, this study brings a reflection and at the same time a reflection on how the difference in environment can incite to different conclusions about the discussion of company value. In the common case, we consider the public utilities sector which have a significant economic and social impact, as they

provide essential public goods and services to citizens. Consequently, understanding the role of the state is fundamental and, in the light of political decisions, assessing the behavior of the business environment.

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