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Determinants of Dividend Policy: evidence from Portugal

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ABSTRACT

Objective – The objective of this article is to identify the determinants of non-financial companies' dividend policy of the Portuguese capital market and contribute to resolve the divergence of determinants of the dividend policy existent in previous studies.

Design/methodology/approach – To solve the problematic under study were tested several financial determinants, through the application of the method of multiple linear regressions to the non-financial listed companies on the Euronext Lisbon, between 1997 and 2011.

Findings – The results suggest as main indicators for the Portuguese dividend policy the stability, the value of the market, the previous pay-out and the business dimension; which influence positively the amount of dividends distribute through the company. Therefore, the opportunities of growing and investment influence negatively the distribution of dividends.

Practical implications – Identify the principal determinants of the dividend policy of the non-financial companies listed on the Portuguese capital markets - Euronext Lisbon and allow sustaining and improving the corporations and investors' decisions.

Originality/value – This study opens up an opportunity to contribute to the understanding of the determinants of dividend policy of the listed corporations in the Lisbon Stock Exchange, aiming permeates greater scientific knowledge in the context of understanding the determinants of dividend puzzle policy and the existing divergences of several previous empirical studies.

Keywords – Dividend Policy, Euronext Lisbon, Cash Flow, Random Walk, Capital Markets.

Paper type – Applied cientific article

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1 INTRODUCTION

Profit is the main economic purpose for companies, being that there can be two destinations attributed to it: the profit can be held in the company and used in its activities, or it can be distributed to shareholders. As for its distribution, it can be done in two ways: in the form of dividends or through the repurchasing of circulating shares.

The present article discusses profit distribution options in the form of dividends, while empirically testing the determinants of dividend policies in non-financial companies listed in the Lisbon Stock Exchange (BVL), between 1997 and 2011.

Gordon (1959) defined the dividends as the form of fragmented payment that investors expect to receive, and determined profit to be the most likely cause for the distribution of dividends.

The dividend policy is considered as part of the set of relevant financial decisions in corporate life because it triggers changes in corporate economic and financial indicators, having a direct impact on funding policy and investment. By the company distributing dividends, it causes a decrease in the liquidity of their assets, which is reflected in a decrease of cash flow1 surpluses, directly influencing the form of compensation of investors in the form of dividends or capital gains.

In formulating its dividend policy, the company needs to assess an optimal level of payment to maximize the return of shareholders. The comparison of these objectives causes a trade-off[2] between the payable amount value and the value to retain. The retention translates into the adequacy of the company's financial structure, while the distribution is reflected in the profitability of shareholders. This uncertainty makes dividends one of the most controversial topics in the corporate finance world, leading to the existence of a diverse and divergent literature on this topic, and proving that the determinants of dividend policy are one of the areas of finance with several unanswered questions. These reasons led Black (1976) to classify this issue as "*dividend puzzle*", because as one tries to solve it, the more it proves to be like an unsolved puzzle, idea that Black (1976, p.5) explains in his statement "*The more we look at dividends, the more it looks like a puzzle, where the pieces just do not fit*." Despite the numerous theoretical and empirical studies in this area, there is no unanimous position on the choice of the determinants of dividend policy, continuing to open new investigations.

Under this motivation, the present work deals with the determinants of dividend policy in listed corporations in the Lisbon Stock Exchange, because the current Portuguese capital market has not yet reached the same level of development of other dimensions of markets, such as the European market, the US market or the Brazilian market.

Therefore, this study opens up an opportunity to contribute to the understanding of this problem, aiming to permeate greater scientific knowledge in the context of understanding the determinants of dividend policy.

This work is organized as it follows: Section 2, which follows this introduction, being addressed the most relevant theories to explain the determinants of dividend policy; Section 3, devoted to the formulation of hypotheses, sample description, data selection and explanation of the methodology used to obtain empirical results; Section 4, which proceeds to the verification and validation of the assumptions of the methodology used, a presentation and discussion is done through results obtained by a Multiple Linear Regression Model (MLRM); and Section 5, where the general conclusions of this study are presented.

2 LITERATURE REVIEW

The controversy of the dividend policy is an old thread, making us go back to 1938, when John Burr Williams first established a relationship between dividends and the value of the company. However, it was in the 1950s and 1960s that this issue had taken relevance in research with theoretical and empirical studies showing

dividends, and it persists decisively influencing all the research and recent explanatory theories of dividend policy, which will be enunciated.

2.1 Relevance Theory of Dividends

The theory of Relevance of Dividend, defended by Lintner (1956) and Gordon (1956), supports the existence of a relationship between the amount of dividends paid and the value of company shares, which are a result of two major factors, net income generated and Dividend payout. This last factor is a dividend distribution indicator for the previous fiscal year.

Lintner (1956) conducted pioneering work in this field through a series of twenty-eight interviews with managers of American companies on the decision of dividend distribution, which found that decisions on the dividend policy were based mainly on payouts. The author also concluded that, in a scarce environment, the preferred companies use borrowed funds rather than decreasing the distribution of dividends by checking certain stability in the dividend policy over the various economic exercises.

Considered as a seminal theory of this theme, the foundation ideas are empirically tested in past decades, as in the studies of Grullon *et al.* (2005), Benzinho (2007), Júnior *et al.* (2010), Ribeiro (2010), and Mubin *et al.* (2014).

2.2 Bird in the Hand Theory

In the 1950s, Gordon and Shapiro (1956) presented a model of stock evaluation which assumes that the dividend grows at a constant rate, under the premise of a direct relationship between the dividend policy and the market value of the company. This model suggests that a stock is worth on the basis of future expectations, and the dividends influence the market value of the company.

These authors share the view that investors are rational and generally risk averse, demanding a higher return before greater uncertainty and risk. This risk premium increases the cost of invested capital and reduces the share price. The distribution of dividends reduces the uncertainty and the required return, being preferable the dividends to the retention of the results; this was a universal accepted idea in the 1960s decade, but has been fading over the years.

Dividends are considered "cash in hand", while capital gains are merely potential. This relationship became known in the world of business finance as "bird in the hand theory", that is, as a bird in a hand.

2.3 Irrelevance Theory of Dividends

In an opposite line to the relevance of dividends, Modigliani and Miller (1961) found evidence that the dividends paid did not affect the company's value or profitability of investors, that is, irrelevant to the value of the company. However, this irrelevance of dividends depends on certain assumptions, such as: facing rational expectations, tax and no transaction costs, information asymmetry and other market imperfections being the capital market perfect and efficient.

In a perfect market, the company's value is determined by the investment policy and the return that its assets offer, in other words, by its ability to generate profit.

Modigliani and Miller (1961) argued that the debt recourse is a cheaper source of financing, and preferable to the use of equity for retained earnings and the issuance of capital. Under this perspective, the distribution of dividends will change the need for the use of external funds.

Although the conclusions reached by Modigliani and Miller (1961) are accepted, there are numerous opinions contrary to the hypothesis of perfect and efficient markets, including the premises of the authors, particularly concerning costs and taxes, personified as an example in cost agency (Jensen & Meckling, 1976).

Fama (1970) sets out more explicitly the Efficient Market Hypothesis (EMH), arguing that in efficient markets the price of an asset reflects all information consistently, and there

is the possibility of obtaining abnormal profits; three types of efficiency are distinguished: weak, semi-strong and strong. Due to the criticism suffered, Fama (1991) made more flexible HME, postulating that this hypothesis implies that bond prices reveal fully all available information.

However, the HME continued to be criticized by several authors as Shiller (1981), Le Roy and Porter (1981), Summers and Shleiffer (1990), Genotte and Lelland (1990), Haugen (1999), and, more recently, it is stated the empirical study about Brazilian shares of Cordeiro and Machado (2013).

2.4 Residual Theory of Dividends

The residual theory is based on the guiding principle that the distribution of dividends will proceed only after an optimal investment decision by the company. This distribution, in turn, will decrease the availability for investments to be financed by issuing new shares or debt capital. However, this capital has an associated cost that exceeds the cost of own equity. Dividends are seen as waste and the dividend policy as residual.

The return is influenced by the investment policy and not by the dividend policy. On the other hand, investors are indifferent to the consideration form of its return, given that it is at least equal to that required by the market (Salsa, 2010).

2.5 Signaling Theory

This theory is based on information asymmetry, which is characterized by one of the parties privileged access to information, that is, managers are holders of more information in the future of the company than the market. This difference in information detention characterizes the asymmetry and managers use it as an "added value" to signal the market about their future expectations through the dividend policy (Miller & Rock, 1985).

The financial markets assess the actions of managers and their implications on the results and in the future value of the company (Damodaran, 2001), being the dividends considered "vehicles" of information, easily accessible and inexpensive.

Lintner (1956) and Modigliani and Miller (1961) obtained empirical evidence consistent with this theory, finding that most of the companies maintained the dividend payout. Ali (2010) concluded to the Bangladesh case that the chosen period of time for the dividend distribution announcement signals the investors.

Lintner (1956) and Lie (2005) document a resistance from administrators in increasing dividends when there are good chances of reconsidering this decision. These authors consider that, at equilibrium, companies have a dividend policy consistent with their prospects for future growth. The study of Brugni *et al*. (2012) supports this conclusion, finding evidence that the results of the companies analyzed together with the dividends had better information in predicting prices than when analyzed individually, thus reinforcing the idea that dividends are carriers of an information signal. However, authors such as Grullon *et al.* (2002) have a different view of signaling theory, through the "maturity hypothesis", which argues that dividends do not signal good news, because a company should only pay dividends when their investment opportunities have been exhausted, linking dividends to risk and decrease profits.

This theory is still setting for empirical studies, as Corso *et al.* (2010), Pietro *et* al. (2011), and Moreiras *et al.* (2012).

2.6 Pecking Order Theory

This theory, also known as theory of order or hierarchy, was reformulated by Myers and Majluf (1984). The authors argue that companies prioritize their sources of funding, based on the premise that the cost of financing increases with asymmetric information, discussing that it is cheaper to use than the debt issue of new bonds.

Business financing can have three sources, domestic financing, use of debt and last resort to equity, which are hierarchical sources in this

order by managers (Myers, 1984; Fama & French, 2002).

Myers (1984) recognizes that this model does not explain the distribution of dividends, but must be considered to affect the dividend decisions, and the payout ratio is negatively related to the investment and financial leverage. Managers retain profits to finance the investments passing over the distribution of dividends to shareholders, not having to submit to supervision and external market assessment, and establish smaller dividend payouts.

2.7 Agency Theory

Theory developed by Jensen and Meckling (1976), which considers the company as a set of contracts, where the shareholders are entitled to company assets and cash flow. Shareholders and managers try to act in defense of their own interests, where each tries to maximize its usefulness. This maximization is achieved under different views and perspectives that create differences and conflicts between the two parties. These conflicts tend to be eliminated, and this elimination operation generates costs, which are called agency costs. Jensen and Meckling (1976) argue the increasing dependence of the wages of managers in function of the results. These authors have suggested that the level of debt and the distribution of dividends are control instruments for managers. On the other hand, it is discussed the increasing dependence of winning results; the authors contend further that the level of debt and payment of dividends are instruments of control of managers because the decrease of available cash flow increases the pressure of shareholders on the company/managers from the market, and this pressure leads to control agency costs. The authors also argue that the growth of opportunities provides an increase in debt, forcing executives to be more efficient.

In this way, the payment of dividends has a positive effect on the market value of the companies; before the distribution of dividends, the available capital decreases, reducing the scope of managers to handle the company's resources (Silva, Santos & Almeida, 2011).

DeAngelo *et al.* (2004) concluded that companies pay dividends to reduce agency costs associated with an indicator of low debt and high cash flows. A view with unanimous acceptance is that the flexibility of management is the missing piece in solving the puzzle.

The rules followed by managers in order to mitigate agency conflicts have been investigated in the form of "corporate governance", which considers the concentration of ownership, the constitution of the board and the debt as control instruments of conflict between managers and shareholders (Reyna, 2012).

Almeida *et al,* (2010) and Lameira (2012) conclude that the adoption of good corporate governance practices makes room for a more transparent management, reducing information asymmetry and agency conflict.

2.8 Client Effect

During the 1970s, researchers and theorists have added a new variable in the discussion of the determinants of dividend policy, the effect of taxes, concluding that dividends create a tax disadvantage for investors because they are taxed at a higher rate than capital gains, reducing the net rate of return.

DeAngelo *et al.* (2009) argue, contrarily to the information provided, that there are investors with a preference for stocks that pay dividends; investors have different attitudes for the same alternatives, and this preference is considered clientele effect. This effect was originally suggested by Modigliani and Miller (1961), who proposed that companies, through their dividend policy, draw themselves their own "clientele"; each investor chooses the company that will invest in according to their needs and views.

Investors' preferences depend on the tax brackets in which they are in; investors in low tax brackets prefer high dividends, and vice versa. Collins and Kemseley (2000) found empirical

evidence that the distribution of dividends does not tax or penalize investors; they keep the portfolio shares with a distribution of dividends related to its tax brackets.

Other factors, such as risk, liquidity and tax situation of each shareholder, are on investors' choice of support. In the same context, the work of Holanda and Coelho (2012) indicates that the clientele effect influences the dividend policy of Brazilian companies.

2.9 Catering Theory

Developed by Baker and Wurgler (2004), this is a theory in the field of behavioral finance that advocates that decisions on dividends are influenced by investor demand, and this may be influenced by feelings. Managers practice a high dividend policy, when investors are willing to pay a higher value for the shares that distribute dividends.

Whether for psychological reasons or for professional reasons, the type of dividends demanded by investors varies over time, between income shares or growth stocks. Another idea put forward by the authors on the basis of this theory are the arbitrage strategies in that building a stock portfolio can diversify and eliminate the specific risk; however, systemic risk is assumed.

3 HYPOTHESES, DATA AND METHODOLOGY

Initially, it was proceeded to the framework of research discussions to be developed and the enunciation of different hypotheses to be tested in a second phase. After the formulation of hypotheses, took place the presentation and description of the sample, referencing information sources used, the data treatment process and the operational definition of variables, dependent and independent, included in the study. The choice of these was done within the scope of most relevant financial variables used in empirical studies with similar goals to ours, highlighting the profitability, capital structure, the size, risk and results. In the third phase, the research methodology used is described, that is, the econometric model used to estimate the empirical results.

3.1 Hypotheses

The research hypotheses are part of the theoretical logic of the research problem, based on the reviewed literature, and the logic to test the determinants of dividend policy. The explanatory variables of dividend policy are grouped into groups such as profitability, size, market value, risk, financial structure, liquidity and stability in the payment of dividends, among others, taken as explanatory attributes of the dividend policy and various financial theories.

In the following sections, the research hypotheses based on the literature review resulting from the articulation of used methods in model building concerning variables to be tested are presented.

3.2 Basic Literature and Formulation of Hypotheses

Profitability is one of the recurring tax groups in explaining dividend policy, considered by many empirical studies and financial theories; this financial tax profitability shows that the same company mirrors the available capital and the distribution of these funds in the dividends.

Authors such as DeAngelo et al. (2004), Fama and French (2001), Lie (2005), Ribeiro (2010) and Yegon *et al.* (2014) concluded that companies with higher profitability levels have a higher tendency for the payment of dividends. This conclusion leads to expecting a positive relationship between profitability and dividends.

Based on the literature mentioned, it is expected a positive relationship between profitability, results and dividends in order to test this relationship to formulate the following hypotheses:

Hypothesis 1: The profitability of the company is positively related to the dividends distributed by Portuguese companies, ceteris paribus.

Hypothesis 2: The financial results of the company are positively related to the dividends distributed by Portuguese companies, ceteris paribus.

The risk measure for the stability of the results is also taken into account and studied in several empirical studies, and it has a negative relationship with dividends. Lintner (1956) and Grullon *et al*. (2002) conclude that companies with lower risks are more likely to pay higher dividends.

Lie (2005) shares the same conclusion, but instead of using the net income, uses the operating results and finds evidence that a lower volatility in operating results leads to increased dividends. It is concluded that after the increase of dividends to earnings, volatility decreases. Authors such as Ribeiro (2010) and Moreiras *et al*. (2012) also tested the relationship between income and the distribution of dividends. This possible expected negative relationship between the variability of results and dividends led to the formulation and testing for the following hypothesis:

Hypothesis 3: The variability of the profitability of the company is negatively related to the distribution of dividends, ceteris paribus.

Lintner (1956) argues that there is a certain stability in the distribution of dividends, opinion also advocated by Ferreira *et al*. (2010), who found a positive relationship between current dividends and those paid in the previous year.

Grullon *et al*. (2005) conclude that dividends are affected by past and present results, and future results show no evidence on dividends.

Ribeiro (2010) suggests that the net income and dividends for the previous fiscal year have a positive and statistically significant effect for companies in the PSI 20. Recently, Mubin *et al*. (2014) tested the stability as a determinant of dividend payments.

Based on the above, as to the results and dividends from the previous year, it is expected a positive relationship for the two variables in order to test these taxes; the following hypothesis is formulated:

Hypothesis 4: The dividends paid in the previous fiscal year are positively related to dividend distribution in the following year, ceteris paribus.

Authors such as Lintner (1956) and Ribeiro (2010) conclude that the increase in the dividend amounted leads to an increased market value of the company.

A positive relationship between the dividends paid and the market value of the company is expected, measured by the price of its shares and its market capitalization. Thus, under these fundamentals, the stock price and market capitalization of each company were used as explanatory variables of the dividend per share.

Hypothesis 5: The level of dividends distributed is positively related to the market value, ceteris paribus.

Size is another factor of much relief in similar studies. Recent studies like Gizelle *et al.* (2013) and Mubin *et al*. (2014) support the conclusion of Salsa (2010) that the dimension shows statistically significant evidence in the dividend distribution of the explanation. Based on this relationship between the size and the distribution of dividends, it was tested the following hypothesis:

Hypothesis 6: Dividends distributed are positively related to company size, ceteris paribus.

Other financial variable with high use in studies of dividends is the growth opportunities

/ investment companies. DeAngelo *et al*. (2004) verified a negative relationship between growth opportunities and investment and the amount distributed in dividends; companies tend to only distribute dividends when they have high levels of liquidity: low debt and lack of project investment is what distributes dividends (Lie, 2005). Operational performance indicators are seen as opportunities for growth and investment indicators.

Financial autonomy is an indication, among others, of the financial stability analysis of companies, used to estimate the impact of debt and risk in the dividend policy. Another indicator often used in similar studies is the solvency, in order to assess the level of solvency of the company. Islam Aamir *et al.* (2012) found a negative relationship between debt and dividends, conclusion confirmed by DeAngelo *et al*. (2004).

However, according to Ribeiro (2010), the results are not consensual among the various empirical studies. Thus, financial autonomy, the debt structure indicator to test the debt related to dividends, will be used. Additionally, two more hypotheses were formulated:

> **Hypothesis 7**: Dividends distributed are negatively related with the debt level of the company, ceteris paribus.
>
> **Hypothesis 8**: Dividends distributed are negatively related with investment opportunities/ company growth, ceteris paribus.

3.3 Operational Definition of Empirical Variables

For the assumptions to be seen as scientific hypotheses, it is necessary that they are susceptible to empirical refutation. Therefore, in search for answers to the research hypotheses, the value of the dividend paid per share (DIVAC) was considered as a dependent variable. This represents the amount, in Euros, that the company distributes to shareholders as dividends for each one of the economic exercises which the present study is focused on. The choice of this indicator is related to its use in many empirical studies with similar objectives for this study, including Lintner (1956), Watts (1973), Arrazola *et al.* (1992), Bagüés and Fumás (1995), Escuer and Cabestre (1995), Naceur *et al.* (2006), Benzinho (2007), Ribeiro (2010) and Yegon *et al*. (2014).

A set of independent variables was used for the explanation of the dividend value distributed per share, and therefore of the determinants of Portuguese companies and dividend policies. Relative to independent variables, there are several economic and financial indicators associated with the study hypotheses; 13 variables were shown to be statistically significant after the application of stepwise method, which is explained below:

Payout Ratio (PAYOUT) - This indicator shows the share of net profits that were distributed in the form of dividends in a given fiscal year. This variable was included in our study in order to assess the stability policy in the payment of dividends, which led us to include the variable in our model (PAYOUTANT), e.g. the payout indicator of the previous year.

Operational Profitability of Asset (RENDOPAT) - Active Operating profitability (RENDOPAT) - The profitability of the company's assets or return on assets indicator shows the ability of the company's assets to generate results; this variable is included in the study in order to test the significance of profitability in the dividend policy. The choice of these variables lies in studies such as Grullon *et al*. (2002) and Ribeiro (2010).

Dimension – This variable is tested in our model using the net assets shown in the reports and final accounts of each fiscal year. The turnover (VNEG) shows the value of the turnover of each company, the turnover per share (VNEGAC), which is calculated by dividing the turnover and the number of company shares, and the asset per share (ATIVAC), which represents the net asset value of each company divided by its number of

shares. These attributes are often used in studies with goals similar to ours, such as Salsa (2010) and Ribeiro (2010).

Market value – The market value is an attribute tested in several empirical studies (Ribeiro, 2010), it is estimated by the value of the share price. In this study, the calculation of share price for the last day of each year was used, creating the variable quotation (COT). Another variable used was the value of stock market capitalization (CAPBOLS) of each company regarding the end of each year. The DIVYELDANT variable can also be related to the market value factor for demonstrating the dividend profitability index to the value of the share price of the previous year.

Dividend Yield (DIVYELD) - This indicator shows the percentage of return on shareholder dependent on the dividend. Studies of Campbell and Shiller (1998), with US data, show that there is a positive relationship between the dividend yield and the market value of the company. In our study, DIVYELDANT was introduced as a variable in order to test the stability of the dividend policy.

Net profit per share Earnings (RESLIQAC) – The net income is used in empirical studies with similar goals until present, highlighting the results obtained by Lintner (1956) and Ribeiro (2010). It was used the net profit obtained by the company and evidenced at the end of each fiscal year, divided by the number of shares.

Operating Income (RESOP) – The operating income is used with the same purpose than the net result, this is the value obtained by the company and evidenced at the end of each fiscal year. However, this is an indicator of operating performance of the company, which for many is seen as an indicator for evaluating growth opportunities.

Dividend of the previous year (DIVEXANT) - In the present empirical study, this variable was introduced in order to check the stability in the distribution of dividends, which is apparent in the dividends per share that the company distributes to its shareholders over the previous fiscal year.

Financial autonomy (AUTFIN) - The financial autonomy, being an indicator that is part of an analysis of the financial balance in the medium and long term and that allows to assess the level of debt and risk associated with the company; it also allows analyzing the financial structure of a company. It appears as another indicator proposed in literature reviewed explaining the company's dividend policy. This indicator determines the percentage of assets that are financed by equity, reflecting the company's dependence on third party capital. In general terms, the higher the value, the better and greater is the financial stability of the company.

3.4 Sample

The present work focuses on the Portuguese stock market, and the sample companies meet the following selection criteria:

i. Companies that remained constantly listed in the stock exchange during the time period from 1997 to 2011 (15 years) were included in the final sample;
ii. Companies which have distribution of dividends by at least a third of the time period (5 years), straight or interpolated, were included in the final sample. This criterion is essentially the subject of the companies that are part of the Portuguese court that do not use the payment of dividends very often, and this occurrence may be due to the fact that the Portuguese stock market is the least valuable of Euronext Lisbon. However, another reason is due to companies reporting negative results in the time period under study. This criterion is important with the purpose of the sample data, which presents minimum criteria of consistency and avoids data gaps in the panel construction, thus preventing failures.

iii. Companies of financial and supporting nature were not included in the final sample due to the specificity that these sectors have, as well as for its account structures. This criterion had been followed by others, as Papadopoulos and Charalambidis (2007) and Ribeiro (2010).

The final sample was reduced thus to 12 companies that fully comply with the selection criteria set out above.

3.5 Data sources

The present empirical study used various data sources to obtain the necessary data, which are the Euronext Lisbon and the Portuguese Securities Market Commission (CMVM).

In the Porto delegation of the CMVM, annual financial accounting reports on corporate governance of sample companies were consulted in paper format, compiling this data to be used in determining the empirical variables.

Through *Euronext Lisbon*, the following data was collected: quotation of the companies related to the closing price of the year that every share had and the amount of dividends distributed to shareholders.

3.6 Data processing

The sample was selected through the Euronext Lisbon website, from where a list of companies quoted on December 31, 2011 was pulled out, making a match with the list of companies on December 31, 1997, obtained from the BVL.

However, the Portuguese economic and financial context admitted during the period under analysis admitted two changes that had to be taken into account in the analysis of accounting and financial reports of the companies concerned. The first was the conversion of the national currency from the previous Portuguese currency, Escudo, to the ongoing European Union currency, the Euro. Reports and company accounts from 1997 to 2000 includes values presented in Escudos, in order to have uniform values and all in the same coherence unit. Therefore, it was proceeded the Escudo-Euro exchange, making up the correspondence of 1 Euro amount to 200.482 Escudos[3]. The second was the change in the accounting system Official Plan of Accounts (POC) for the Accounting Standardization (CNS).

Once these features were applied, the calculation of a set of economic and financial indicators took place. The data necessary to calculate the dependent variable and attributes to be tested were first imported into spreadsheets, where some of the changes were made. Despite the base year of the study being 1997, data from 1996 was consulted to calculate some variations and indicators.

After the calculations of the different indicators, as well as considered necessary transformations cited above, the data was exported to the Statistical Package of Social Sciences (SPSS) software, version 19, with the purpose of statistical analysis.

3.7 Methodology of the Multiple Linear Regression Model

In order to test the determinants of dividend, an inevitability arose to proceed with the estimation of an econometric model in order to conclude what kind of relationship presents the independent variables to explaining the dependent variables.

We opted for the realization of a quantitative and correlational research; quantitative because it resorts to numerical and correlational data and because it aims to explore and determine the existence of relationships between variables in the hypergeometric plan.

The research methodology used in building the model to test the hypothesis of the study in order to achieve the research goals was based, like Ribeiro (2010) and Salsa (2010), in a Multiple Linear Regression Model (MLRM). This model consists of a data analysis technique that assumes a linear relationship between the dependent variable

and a set of explanatory variables, or independent variables (Gujarati, 2003). The use of MLRM was also motivated by the fact that it is the recurrent methodology in studies in the field of Corporate Finance. Table 1 summarizes the methodology used in 31 studies similar to ours, verifying that 54.8% of the analyzed studies applied a MLRM.

TABLE 1 – Methodologies used in similar studies in this field

Methodology	Nº of studies	%
MLRM	17	54.8%
Panel Data	5	16.1%
MLRM and Panel Data	2	6.45%
MLRM and Tobit	1	3.22%
Others	6	19.35%
Total	31	100%

Source: The authors

In regression performed, the p-value was considered for 5% significance level. The selection of variables with discriminative power was performed using the stepwise method in order to get the best possible model. This method consists in joining two other methods, Standard Regression and Hierarchical or Sequential Regression, that is, a mixture of Forward and Backward methods which, according to Marôco (2011, p. 547), enables the analysis gradually adding or subtracting the variables analysis process automatically according to their discriminative capacity and fulfillment of assumptions. After obtaining the best model, assumptions of MLRM were tested for examining the correlation coefficient (R), the coefficient of determination (R^2), the results of the Durbin-Watson tests to the residuals, and the Kolmogorov-Smirnov normality.

The coefficient of determination (R^2) is a measure of the dimension of the effect of the independent variable on the dependent variable, as described by the regression model (Marôco, 2011), and measures the total variability that is explained by the regression. Gujarati (2003) claims that the variables used in the MLRM must be according to the assumptions of residual normality, homoscedasticity and linearity coefficients, with no correlation between the waste and multicollinearity.

The functional relationship presented in MRLM between the dependent variable and the independent variables are the type:

$$Y_i = b_0 + b_1 X_{1i} + \beta_2 X_{2i} + b_3 X_{3i} + \beta_4 X_{4i} + ...+ \beta_k X_{ki} + \varepsilon_i \quad (1)$$

($i = 1,.....n$)

Y_i - dependent variable, e.g. the dividends per share indicator;

β – coefficients of the regression to estimate;

X_i - independent variables;

ε_i – error or random variable.

In this context, the explanatory power of the independent variables on the dependent variable were tested, and the final model includes only the variables that have statistically significant and satisfactory assumptions of MLRM.

The least squares method is used to estimate the model parameters, in which the estimates of regression coefficients are obtained so that the errors or the residuals of the linear regression model, calculated by $e_i = y_i - \hat{y}_i$, were the minimum possible, in other words, the distance between y_i and $\hat{y}_i$ being the lower possible, and where $\hat{y}_i$ are the expected values according to the model. Thus, the estimation of the regression coefficients (b) is obtained after considering the effect of other independent variables on the dependent variable by determining the minimum of the function of the sum of squared errors (SSE) of the model.

$$SQE = \sum_{k=1}^{n} \varepsilon_k^2 \quad (2)$$

The assumptions were tested by the recurrence of adjustment tests and by a graphical interpretation.

One of the model assumptions to validate is the homogeneity of the residuals, tested empirically through the White test (White, 1980), under the following assumptions:

H0: the residuals variances are homogeneous;

H1: the variances of the residuals are not homogeneous.

The statistical test of White (White, 1980) is given by:

$$W = nR^2 \sim X^2_{[2p+(p-1)*p/2]} \quad (3)$$

The assumption of normal distribution of errors can be verified graphically (Marôco, 2011) through the normal probability plot.

Other assumptions of the model to be validated are the multicollinearity of the explanatory variables, which occurs when they are highly correlated. This assumption can be measured by the variance inflation factor (VIF). This indicator shows when the value 1 corresponds to the absence of autocorrelation; when it presents values above the threshold value of 5, it is considered the existence of autocorrelation (Marôco, 2011).

The independence of the residuals is another assumption to be validated. It verifies, through the Durbin-Watson statistic - which measures the correlation between each residue and the residue to the immediately preceding period -, tests for the presence of autocorrelation between errors or residuals of the linear regression model. If the autocorrelation is present in a data set, the regression model could be seriously compromised.

The residuals independence assumption is tested by the following hypotheses:

H_0: $\rho=0$ existence of independence. H_1: $\rho\neq0$ existence of dependence.

$$d = \frac{\sum_{j=1}^{n-1}\left(e_{j+1} - e_j\right)^2}{\sum_{j=1}^{n} {e_j}^2} \quad (4)$$

According to Marôco (2011), in an empirical way, H_0 is not rejected if $d \approx 2{,}0$ ($\pm 0{,}2$), but in a more accurate manner for this test, one should compare the value of d with the lower limit (d_L) and an upper limit (d_U) - these limits derive from the table "*Critical Values for the Durbin-Watson Test*" - for a 5% significance level, in order to test the hypotheses H0: no autocorrelation between residuals versus H1: there is autocorrelation between residuals. The Kolmogorov-Smirnov test with Lilliefors correction is a test of adjustment to normality under the following hypotheses, H0: X ~ N (μ, σ) vs H1: X ~ N (μ, σ).

The test statistic is given by the biggest difference between these two differences, e.g. D= max {max (|F(xi)-F0(xi)|; Max (|F(xi-1)-F0(xi)|)} where $F_0(X) \sim N(\mu,\sigma)$, the critical value of the Kolmogorov-Smirnov distribution is tabulated, being rejected H0 if D≥D table (α).

The stationary of the series was another of the assumptions to be scanned. According to Gujarati (2003), a time series is stationary if in all the moments of its probability distribution, the mean and the variance are constant over time. It is expected that the errors are independent. To verify the presence of different variances, graphical representation of the standardized residuals and estimated values were used. If the residuals are distributed more or less randomly around zero, the variance is constant. The assumption of normal distribution of errors is investigated through the normal probability plot, with recourse to the unit root test in order to assess the stationary of the series.

4 ANALYSIS OF THE MODEL, RESULTS AND DISCUSSION

In first place, it will be addressed in this section the validation of assumptions of the

methodologies MLRM and Panel Data; and secondly, the analysis and discussion of the obtained results.

4.1 Analysis of the Estimation

In the MRLM, by applying the stepwise method, 15 different models were proposed and tested as well as 13 independent variables, which were selected. All the variables considered are statistically significant to a significance level of 5%, and traduces, as in Ribeiro (2010), in the method of ordinary least squares (OLS) with robust standard errors. This method proves to be suitable to fill any heteroscedasticity problems, susceptible to arise in sectional samples. To demonstrate the statistical inference of the regression model, which are considered more explanatory and robust, it was started an approach to the analysis of variance model, allowing to test the hypotheses H_0: $\beta_1=\beta_2=...=\beta_k=0$ vs H_1: $\exists i \neq \beta_i \neq 0$; (i=1,...,k).. The value of the F statistic that has F-Snedecor distribution has a value of 45.018. This statistic is associated with a p-value = 0.00, which means that it is statistically significant for a significance level of 5%, rejecting H0 instead of H1, from which one can conclude that the model is essential.

After estimating the regression, it is verified that it has a high explanatory capacity, that is, the tested independent variables explain 77.9% of the variations in the dependent variable. The explanatory power is much greater than that presented by similar studies, since dividends follow a random walk[4].

The presence of multicollinearity was checked by the VIF, and the model does not present multicollinearity problems, and through the Pearson correlation matrix it is concluded that the variables do not show strong correlation.

For the residual independence assumption, through the table "Critical Values for the Durbin-Watson Test", H0 is not rejected, so it can be concluded that there is no autocorrelation between residuals.

Through the analysis of the residual plots - normal probability plot - is possible to conclude that the residuals have a normal distribution, and also by the analysis of the scatter plot chart that are not in the presence of homocedasticity, being the series stationary, which was corroborated by the unit root test.

The Kolmogorov-Smirnov test, used to determine whether the errors follow a normal distribution to provide a p-value 0.223 higher than the 0.05 significance level, supports the conclusion for not rejecting H0, that is, the data have normal distribution, and it is possible to conclude that in the models there is no apparent breach of assumptions.

The table 2 presents the summary of models tested. The last model was considered as the best explanatory model, on which are explicit the coefficients of determination, the adjusted coefficient of determination, the Durbin-Watson statistical and the F statistical.

TABLE 2 – Summary of the outputs of some statistically significant models

	Expected signal	Model 1	Model 2	Model 3	Model 4
CONST.		.096***	-.022	-.143***	-.203***
DIVEXANT	+	.572***	.321***	.255***	.190***
VARCOT	+		.005***	.004***	.004***
DIVYELD	+		3.028***	2.533***	2.759***
DIVYELDANT	- / +		-2.009***	-1.670***	-1.695***
CAPBOLS	+		7.45E-12***	7.84E-12***	9.52E-12***
CF. INVEST. ACT.	-		.027***	.003	.087
ATIVAC	+		.004***	.008***	.010***
VNEGAC	+ / -		-.003***	-.003***	-.004***
PAYOUT	+			.053***	.059***
AUTFIN	+			.157**	.147*
RENDOPAT	+			.628*	1.018***
RESLIQAC	+				.009**
PAYOUTANT	+				.044*
RESOP	+ / -				-3.11E-11*
R		.576	.853	.871	.883
R^2		.332	.728	.758	.779
R^2a		.329	.715	.742	.762
D W		1.775	1.784	1.820	1.817
F		88.607***	57.252***	47.823***	45.018***

Depent variable: value of the dividend per share.

*p significance <0.05; ** p significance <0.01; *** p significance <0.001

4.2 Discussion and analysis of results

For the analysis of the absolute values of standardized regression coefficients, it is verified that the variables that have higher relative contributions in explaining the dividends per share are active per share, the dividend yield, the market capitalization, the operating profitability of the asset and turnover per share.

Analyzing the explanatory effect of independent variables on the dependent variable, it is proved, relatively to DIVEXANT variable, that the results show a significant positive effect on the dividends per share paid to shareholders, suggesting, therefore, that non-financial companies listed on the market of Portuguese capital have a tendency to maintain a certain stability in its dividend policy. This stability is ensured by the variables PAYOUT, PAYOUTANT, DIVYELD, meeting the conclusions of authors such as Lintner (1956), Ferreira *et al.* (2010) and Ribeiro (2010).

On a different note, the variable DIVYELDANT shows a negative relationship with the amount of dividends distributed, which is justified due to respect of this indicator evidences the percentage of the remuneration of dependent shareholders of the dividend, while occurring a distribution in the form of dividends that will produce an increase in the quotation value. This appreciation of the price share changes the percentage of the remuneration to shareholders as dividends in the following year, *ceteris paribus*.

The COT and the CAPBOLS variables have a significantly positive effect on the amount of dividends per share. Thus, the results seem to suggest that the share price and market capitalization influence the dividend policy, that is, shares traded at a higher price in the

capital markets allow investors to earn higher amounts of dividends by action. This conclusion is also supported by the analysis of DIVYELD and DIVYELDANT variables, as referenced previously, and meets the conclusions reached by Gordon (1959) and Ribeiro (2010), who claim that the increase in the dividend amounted leads to the increase in the market value of the company, and vice versa.

The RESLIQAC variable evidences a significant and positive effect in relation to dividends, leading to the conclusion that a larger result shown at the end of fiscal year provides greater distribution of dividends. This conclusion is consistent with that found by Lintner (1956) and the relevance theory of dividends, and contrary to the evidence of a negative relationship between net income and dividends, found by Ribeiro (2010).

Inconsistent with the assumption made on net income, the RESOP operating results demonstrate that the company's operational activity results are statistically significant in the model, but have a negative relationship with the distribution of dividends. This negative relationship can be explained by the creation of growth and investment opportunities that a high value presented by these results creates for businesses.

Investment and growth opportunities are financial variables with high use in studies with similar goals to ours, often measured by sales growth. However, this variable was not significant in explaining dividends in Portuguese case. This non-significance is coincident with the study of Ribeiro (2010).

The results presented by the variable RESOP suggest that the flow from operating activities allows to create investment opportunities for companies, and the distribution of dividends to unsuccessful investment, looking to reinforce the idea that companies tend to retain the results to invest at the expense of its distribution, which is defended by DeAngelo *et al.* (2004) and Patra *et al.* (2012).

The RENDOPAT variable, by the evidenced positive sign, leads us to conclude that increased profitability provides greater distribution of dividends. This conclusion coincides with those obtained by DeAngelo *et al.* (2004), Fama and French (2001), Naceur *et al.* (2006) and Holanda and Coelho (2012), conflicting with the evidence found by Guzmán (2004) and Ribeiro (2010).

The VNEGAC variable as an indicator of the business dimension, contrarily to expectations, has a negative relationship with dividends distributed with significant statistical evidence. This result contradicts the evidence found by Ribeiro (2010), although these have been obtained for the turnover in absolute value and not for the value per share.

The relationship presented by this variable with the dividends paid per share, in that an increase in turnover provides growth opportunities of the company, allows us to observe that an increase in value presented by this variable takes the company to invest in order to grow in market, national or international, away from investment dividends. The finding of this negative relationship between growth opportunities and the dividend distribution is consistent with the empirical evidence and conclusions found by authors like Patra *et al.* (2012) and Gizelle *et al.* (2013).

The companies' size, measured by ATIVAC variable, has a positive and statistically significant relationship with the dividends, defending the idea that larger companies pay more dividends, which meets the conclusion advocated by Holanda and Coelho (2012) and Gizelle *et al.* (2013).

In the present study, the availability of liquid assets and its financial structure, tested under the indicators of liquidity, solvency and cash flow, have not shown to be significant, with the exception of AUTFIN variable, which has a positive relationship in explaining the distributed dividends. This indicator expresses the share of equity financing, enabling the analysis of the company's degree of leverage, where an increase in this indicator implies a decrease in the level of debt and allows an increase in dividends.

Since the financial autonomy indicator determines the percentage of assets that are financed by equity, in general terms, the higher is this indicator, greater financial stability is presented by the company, finding also obtained by DeAngelo *et al*. (2009). However, Ribeiro (2010) suggests that the financial autonomy is not statistically significant.

As to their solvency, the financial stability of the company in the present study was not statistically significant.

The risk, measured by the stability/volatility of the results, was tested empirically. Statistically significant explanation was not observed in the distributed dividend amount per share, contrarily to the results of Litner (1956) and Grullon *et al*. (2002). These authors concluded that an increase in dividends is made by companies with lower risk.

5 CONCLUSIONS

As stated in the initial part of the work, the dividend policy has been one of the areas of corporate finance that has designed more works of empirical and theoretical research. This study was based on identifying the determinants of non-financial companies' dividend policy of the Portuguese capital market, and applied a MLRM, where the dependent variable is the dividend per share that the company distributes to its shareholders.

According to the Agency Theory of Jensen and Meckling (1976), when the profitability is distributed in the form of dividends, it may have a mediating function of conflicts between investors and managers. Yet under the genesis of the Signaling Theory, the distribution of dividends may be one way of signaling the market.

The findings for the indicator profitability allow meeting the view that the companies listed on the Portuguese stock market, which show a higher level of profitability and net income per share, are more likely to pay dividends. This is in line with the Relevance Theory of Dividends.

Conflicting with the evidence of net income, a negative relationship by operating results was obtained, which allows concluding that this indicator has an opposite movement of the explained variable and indicating that it is not a higher value of operating results that will increase the amount distributed in dividends. Therefore, it can be concluded that before growth opportunities, companies choose to retain results to invest.

Regarding the influence on dividend policy by the debt level presented by the company, it is possible to conclude that the dividends are negatively related to debt, in other words, a very indebted company tends to pay less dividends. This study shows that for the companies listed on Euronext Lisbon to distribute dividends, they must have an appreciation of the price of its shares and consequently of its market capitalization.

Companies that remained in the stock market index of Euronext Lisbon, from 1997 to 2011, have a maintenance trend and stability in the payout, granting privilege to practice stability in its dividend policy, evidence that coincides with the Lintner model (Lintner, 1956). As for the indication of companies' dividend policy in a given fiscal year, it is positively affected by dividends in the previous year.

Regarding the business dimension, the results obtained through a positive and significant relationship allow to conclude that larger companies show a trend to pay more dividends, which is consistent with the Agency Theory.

The conclusions of several empirical studies on the dividend policy, as stated before, are not consensual, which leads us to believe that much can still be investigated upon in this area.

NOTAS

1. Cash flow is the balance between the inflow and outflow of liquid assets (cash), resulting from the activities of the company.
2. *Trade-off* means a situation of conflict of choice, to choose A instead of B, when the decision is taken under complete understanding of both sides of choice.

3. Escudo was the national currency of Portugal from May 22, 1911 until the entry into circulation of the Euro on January 1st, 2002.
4. *Random Walk* is the terminology used to describe the random walk that dividends show as following.

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