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FISCAL EFFECT IN DIVIDEND DISTRIBUTIONS

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Abstract

The dividend irrelevancy proposition, which states that dividends have no impact on the market value of the firm, is only valid under the hypothesis of perfect markets. If market imperfections are considered, namely, the existence of taxes, then dividend distributions became relevant for the decisions of market investors. But even in the presence of taxes, it should be indifferent for the investors to trade before or after the dividend day. If rational arbitrage prevails, the stock price adjustment on the distribution day should reflect the relative taxation of dividends and capital gains. In this paper, this theoretical framework is applied to portuguese data.

Keywords: dividend distributions; taxes; capital gains; stock price adjustment

JEL Code:G14;G35

1. INTRODUCTION

The dividend policy irrelevancy proposition was introduced by Miller and Modigliani (1961). These authors state that investment decisions are completely independent of the dividend policy. The firm can decide to pay any level of dividends, without affecting the investment decisions. If the resources generated internally are insufficient, the firm falls back upon external financing. The firm's market value only depends on the distribution of the future cash-flows, which results from investment decisions, and this distribution doesn't depend on the dividend policy. Miller and Modigliani (1959) state: *"The only role of dividend policy is to determine what proportion of each year's investment is to be fi-*

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nanced from retained earnings and what proportion from outside sources". At the same time, from the stockholders' point of view, the only effect of the dividend policy is to determine the amount of earnings generated by the firm, that he receives in form of cash and in form of capital gains.

The presupposition that the payment of dividends is irrelevant, that it doesn't have any effect in the stockholders' wealth nor in the firm's market value, is only valid while we accept the hypothesis that the markets are perfect and efficient. If this hypothesis is relaxed, in the sense of incorporating market imperfections, namely, taxes, or transaction costs, or information asymmetry, the decisions relative to the distribution of dividends become relevant for investors, and may affect the firm's performance in the stock market.

In this paper, we will analyze the behavior of stock prices in the dividend distribution dates, for firms quoted at the market of official quotations of the Lisbon stock exchange, and verify if this behavior is consistent with a fiscal interpretation.

2. THE EFFECT OF TAXES

In a perfect stock market, the stock price should go down exactly by the amount of the dividend paid. Otherwise, an investor could profit from buying (selling) the stock before the dividend distribution and selling (buying) the stock then, if the price lowered less (more) than the value of the allocated dividend.

In a context of imperfect markets characterized by the existence of taxes on capital gains and on dividends, the several studies that have been done, from which we point out the works of Campbell and Beranek (1955), Durand and May (1960) and also the works of Elton and Gruber (1970), Kalay (1982), Litzenberger and Ramaswamy (1979, 1982), Miller and Scholes (1982), Auerbach (1983), Eades, Hess and Kim (1984), demonstrated empirically that the price reduction is, on average, less than the gross dividend. The existence of a tax differential, that is, the dividend tax being greater than the capital gains tax, has been pointed as a potential explanation for that stock price behavior. This result can be also interpreted as evidence that taxes influence the market behavior, because the investors discount the future dividend taxes.

2.1 The equilibrium condition of Elton and Gruber

Elton and Gruber (1970) have done seminal work in this area. These authors tried to establish a relationship between the stock price behavior on dividend distribution days, and the marginal investor's personal income tax. In a market with rational arbitrage, the price reduction should reflect the relative value of dividends and capital gains for the marginal stockholder.

For the investors it should be indifferent to sell the stock before or after the dividend, in other words, the net return obtained by the stockholder if he sells the stock before the distribution, should be same as the net return obtained if he sells after the distribution. The market equilibrium condition is:

$$P_{an} - t_{mv}(P_{an} - P_c) = P_{ap} - t_{mv}(P_{ap} - P_c) + D(1 - t_d) \quad (1)$$

where,

- P_{an} = stock price on the day before the dividend distribution (ex ante-day¹);
- P_{ap} = stock price on the day after the dividend distribution (ex post-day);
- P_c = stock price when stock was acquired;
- D = gross dividend;
- t_d = dividends tax rate;
- t_{mv} = capital gains tax rate.

The left side of equation (1) represents the net amount received by a stockholder, if he decides to sell the stock on the day before the dividend distribution, and the right side of the equation represents the net amount received if he decides to sell the stock on the day after the dividend distribution.

From equation (1), we can obtain:

$$\frac{P_{an} - P_{ap}}{D} = \frac{1 - t_d}{1 - t_{mv}} \quad (2)$$

In the presence of taxes, the stock price reduction after the dividend distribution should reflect the relative fiscality on dividends and on capital gains. Thus, we have:

- If $t_d > t_{mv}$, the price adjustment should be less than the dividend amount;
- If $t_d < t_{mv}$, the price adjustment should be more than the dividend amount;
- If $t_d = t_{mv}$, the price adjustment should be equal to the dividend amount.

As the tax on dividends becomes higher, the degree of expected stock price adjustment in relation to the allocated dividend becomes smaller. At the same time, the higher the tax on capital gains is, we expect a higher stock price adjustment.

¹ "Ex ante-day" is used to identify the date of the last Stock Exchange session where the stock was transacted, with the right to receive the dividend. "Ex post-day" refers to the date of the first Stock Exchange session where the stock was transacted, without the dividend. Note that the date of the "ex post-day" can be previous to the date in which the dividend is actually paid.

3. THE FISCAL EFFECT ON DIVIDENDS – AN EMPIRICAL STUDY WITH PORTUGUESE DATA

The purpose of this study is to try to detect a fiscal effect associated to the dividends, through the analysis of the degree of stock price adjustment in the dates of dividend distributions, for the firms quoted at the market of official quotations of the Lisbon stock exchange, in the period going from January 1990 to September 1999. The database consists of 446 observations that include dividends paid on years 1990 through 1998, covering 121 firms.

3.1 The *FE* statistic

The empiric analysis will begin with the calculation of the ratio on the left side of equation (2), which we will refer to as the “fiscal effect” (*FE*) statistic:

$$FE = \frac{P_{an} - P_{ap}}{D} \quad (3)$$

where,

- P_{an} = stock price on the ex-ante day;
- P_{ap} = stock price on the ex-post day;
- D = gross dividend;

A possibility that should be admitted is that the use of closing prices may introduce a bias in the statistic, because the price variations between the ex ante-day and the end of the ex post-day, may partly be attributed to systematic variations in the market prices, or to other specific factors with impact in the firm value, and thus, they do not result only of the adjustment due to the distributed dividend.

This bias could be even more significant, considering that:

- in the period from 1992 to March, 24th, 1997, the stock transactions were suspended during the four Stock Exchange sessions prior to the day of the dividend distribution, which means that between the ex ante-day and the ex post-day, there was always a difference of at least four calendar days;
- in spite of a previous filtering of the observations, based on a criterion of minimum liquidity, some of the stock included in the sample presented liquidity levels that could still come to reveal as being excessively reduced, reflected on the fact that some stocks remained untransacted for several days surrounding the dividend day.

To correct the potential bias introduced by the normal trend of the market, the ratio (3) was also calculated with an adjustment on the closing price of the ex post-day:

$$FE_{corr} = \frac{P_{an} - \left(P_{ap} \frac{IM_{an}}{IM_{ap}} \right)}{D} \quad (4)$$

where,

IM_{an} = stock market index² on the ex ante-day;

IM_{ap} = stock market index on the ex post-day;

This adjustment of the ex post-day closing price is equivalent to the one proposed by Kalay (1982). After this adjustment, any non-zero return between the ex ante-day and the ex post-day will be considered abnormal. This adjustment takes into account the general trend of the market, but it doesn't incorporate the effect of the systematic risk of each stock. It is only consistent with the CAPM model, if we admit the simplifying hypothesis that all stocks have an unitary systematic risk (beta equals one).

An alternative adjustment that, a priori, we could theoretically consider more appropriate, would be to take into account not only the general trend of the market index, but also the systematic risk that could be estimated for each firm/year using a CAPM model version. The decision was not to follow this road because: (1) for practical reasons, given the fact that the number of observations used would force the estimation of 446 regressions, to obtain the coefficient of systematic risk associated to each firm/year. For each one of those regressions it would be necessary to build the daily returns series for the stocks and for the market index, for a period surrounding the distribution dates; (2) The work involved in collecting and treating all this data, as well as in the estimation of 446 regressions, was considered disproportionately high, taking into account the doubtful benefits that this refinement could bring to the quality of the statistical tests, as clearly demonstrated by Brown and Warner (1980)³.

² The market index used for this adjustment was the BVL Geral, chosen for its representativeness of the general trend of the market. The use of this index, instead of any other, won't affect significantly the results, given the high correlation degree that exist among the main indexes.

³ Brown and Warner (1980) have conducted a comparative study of different methods of estimating the abnormal returns of stocks, in event studies. The authors refer, namely, that the estimation of the expected returns using CAPM, suffers of the problem that the systematic risk is not an observable real variable, it is an estimate that is subject to be measured with error. In small samples, the sampling errors can be so significant that they may overturn any benefit from a more precise specification return generation process. These authors conclude that the differences between the several methods are very small, and that the simplest methods, as the calculation of average returns or the calculation of returns adjusted by the market trend, will detect with the same frequency the presence of abnormal returns, as the methods based on CAPM. The power of the statistical tests doesn't seem to be increased when specific adjustments in relation to the systematic risk of the stocks are used.

The possibility that the stock with reduced liquidity could distort the global results, was controlled by another statistic (FE_4), calculated for a subsample of 174 observations (which we will refer to as the restricted sample). This sample is composed by the observations where the difference between the ex ante-day and the ex post-day didn't exceed four calendar days. The formula for this statistic is equal to the formula of FE_{corr} .

Table I presents some descriptive statistics of FE , FE_{corr} and FE_4 :

TABLE I

Descriptive Statistics

	FE	FE_{corr}	FE_4
Mean ($\bar{x}$)	0.6123	0.6583	0.4261
Standard Error of Mean ($s/\sqrt{n}$)	0.1014	0.1014	0.1403
Standard Deviation of Sample (s)	2.1415	2.1420	1.8508
Minimum	-12.55	-12.4451	-7.1218
Maximum	23.65	21.5755	13.5244
Number of observations (n)	446	446	174

The mean of FE_{corr} is 0.6583, which signifies that the mean adjustment in the stock price, after a dividend distribution, is less than the dividend value. For the restricted sample, the mean price adjustment is still more reduced (0.4261). The obtained value for the FE_4 statistic, is compatible with the theoretical interpretation of the existence of a fiscal effect unfavorable to the dividends.

In this context, a very important issue is to evaluate, for the Portuguese market, which values these statistics could have, consistent with the taxation on dividends and on capital gains. In the following, we will present the main aspects of fiscality incident on these two types of returns.

In what respects to dividends:

- From 1990 to 1993, the dividend tax on stock market quoted firms ranged between 15% and 20%;
- In 1994, the dividend tax became 12.5% for the privatized firms, while for the remaining firms quoted in the Stock Exchange, the dividend tax was 15%;
- In 1995, the dividend tax of privatized firms went down to 6.25%;
- The individual investors can choose to: (a) receive the net dividends and be free of any further fiscal obligation; or (b) declare dividends as part of their personal incomes, which will allow them, independently of their marginal tax of IRS, to reduce the tax burden (because there is a tax credit);
- The firms have to declare dividends received as part of their collectable income. Some firms benefit from a deduction of 95% of the dividends

received, in the calculation of their collectable income, which results in a taxation of dividends received from stock market quoted firms of around 1%. All other firms benefit from a tax credit, which implies an effective tax rate of 14.4%⁴;

- In all of the previous points, the taxes are added of 5%, relative to the successions and donations tax.

In what respects to capital gains:

- The tax rate is 10%, added of the successions and donations tax (5%);
- If the stocks are held for more than one year, the capital gains are not taxed, and only the successions and donations tax (5%) is applied;
- In the years 1990 and 1991, the investors would have to hold the stock at least two years, to be exempt of the capital gains tax.

Within this framing, it is clear that even in the less favorable scenario, the taxation on dividends could never exceed 25% of the gross dividend ($t_d=25\%$). In the most favorable scenario of capital gains taxation, the applicable tax is 5% ($t_{mv}=5\%$). Taking the equation (3), and the inexistence of transaction costs hypothesis, the minimum value that we would expect to obtain for the *FE* statistic, compatible with the interpretation of the existence of a fiscal effect, would be of 0.789⁵. If we admit less unfavorable taxation scenarios for dividends and/or more

⁴ The firms are subject to income taxation (IRC). In this case, the dividends are always included in the basis for the calculation of the tax. The important thing to point out, is that for some firms (including insurance companies, brokers, investment and holding companies, and firms whose participation in the capital of others exceeds 25%), it is possible to deduct 95% of the received dividends, net of the successions and donations tax and of tax benefits, from the collectable income. We can differentiate two periods:

1990 - 1993:

- Stocks of firms quoted in the Stock Exchange: the taxable dividends are $((1-0.05)*0.8*(1-0.95)=3.8\%$. If we consider a tax of IRC of 36%, the tax on dividends becomes 1.368% ($=0.038*0.36$);
- Stocks of privatized firms: The proportion of dividends subject to IRC will be: $((1-0.05)*0.6*(1-0.95)=2.85\%$. The dividend tax will then be 1.026% ($=2.85*0.36$).

1994 - 1999:

- Stocks of firms quoted in the Stock Exchange: In this situation, we will have as taxable dividends $((1-0.05)*0.5*(1-0.95)=2.375\%$. the tax on dividends becomes 0.855% ($=0.02375*0.36$);
- Stocks of privatized firms: The proportion of dividends subjects to IRC will be: $((1-0.05)*0.5*(0.5)*(1-0.95)=1.1875\%$. The dividend tax will then be 0.4275% ($=0.01875*0.36$).

In short, these types of firms will be subject to a virtually null taxation on dividends.

The firms with participations in the capital of other firms of less than 25%, have to include the total amount of the dividends in the collectable income. However, there is a tax credit. In the most favorable situation, observed starting from 1995, the implicit tax on dividends is of 14.4%; if the dividend paid is 1m.u., the correspondent earnings before tax are 1.5625 ($=1/(1-0.36)$). The IRC on the firm that distributed dividends is 0.5625 m.u. and the tax credit is 0.3375 ($=0.6*0.5625$). The firm that receives the dividends will pay IRC of 0.4815 m.u.. Thus, the net dividend tax, for these firms, is 14.4% ($=0.4815-0.3375$).

⁵ The theoretical minimum for the *FE* statistics results from taking the maximum tax on dividends and the minimum tax on capital gains, in other words, when: $(1-0.25)/(1-0.05) = 0.789474$.

unfavorable capital gains taxation, the FE statistic should be closer to 1, or even above to 1.

Table II presents the probabilities of the true means of the FE statistics being greater than each one of these two theoretical values (0.789 and 1). As it is verified, the probability of the statistics true mean being equal or greater than 1 is practically null. Relatively to the possibility of the true means being above the theoretical minimum limit of 0.789, this hypothesis is rejected with a confidence level of 90% for FE_{corr} and with a confidence level of 99.5%, for FE_4 .

TABLE II

Tests on the FE Statistics

	FE	FE_{corr}	FE_4
Mean ($\bar{X}$)	0.6123	0.6583	0.4261
Standard Error of Mean ($S\sqrt{n}$)	0.1014	0.1014	0.1403
z-value for $\mu=1$	-3.82377	-3.36938	-4.09023
Probability of $\mu \geq 1$	0.007%	0.038%	0.002%
z-value for $\mu=0.789$	-1.74760	-1.29368	-2.58977
Probability of $\mu \geq 0.789$	4.0%	9.8%	0.5%

These results lead us to reject the fiscal explanation for the only partial stock price adjustment, on dividend distribution days. Obviously, the possibility of existence of fiscal effects that affect the degree of stock price adjustment can not be refuted. But what can be said, without any doubt, is that the partial stock price adjustment on dividend distribution days, can not be explained, exclusively, by fiscal effects.

3.2 Fiscal effect and tax regimes

We have concluded that the stock price adjustment, following the dividend distribution, can not be explained exclusively by fiscal effects. However, at least a part of the price adjustment might be partially affected by the different fiscality on stocks, in the time period under analysis.

Considering that the fiscal framing, in what respects to capital gains, remained essentially unchanged during the time period under analysis, and that the main fiscal changes were related to dividends, we tried to identify the effect of the different "tax systems" on the degree of stock price adjustment, following the dividend distribution.

The "tax systems" identified in the time period, were the following:

1. in 1990, the tax on dividends was 25% (68 observations);
2. from 1991 to 1993, the tax lowered to 20% (123 observations);

3. from 1994 to the end of the period, the tax lowered to 17.5% and, for privatized firms, became 11.25% (206 observations).

In this empirical part of this study a more sophisticated econometric analysis was applied, with the estimation of the following equation.

$$CORR_VAR_i = \beta GROSS_DIV_i + \varepsilon_i \quad (5)$$

where,

$CORR_VAR_i$ = difference between the stock price in the ex post-day (closing price adjusted by the market index) and the stock price on the ex ante-day (closing price);

$GROSS_DIV_i$ = gross dividend;

ε_i = random residual variable;

β = degree of stock price adjustment following a dividend distribution.

The β coefficient has an identical interpretation as in the left side of equation (2).

The regressions results, for the three subsamples (time periods), are presented in Table III.

TABLE III

Regressions results

Regression	β Coefficient	t-ratio	R^2	n
A (1990)	-0.2755	-2.161	0.1360	68
B (1991 to 1993)	-0.5698	-6.800	0.0037	123
C (1994 to 1998)	-0.7277	-5.350	0.0959	206
D (1990 to 1998)	-0.5704	-7.952	0.0721	397

The estimation of separate regressions, for each of the three time periods, results in very different β coefficients, all of them statistically significant at the levels of 3%, 1% and 1%, respectively. The β coefficients are progressively approaching 1.

The R^2 obtained are apparently very low, but this is a common result in models where the data has a panel structure and is, as in our case, essentially cross-section⁶.

⁶ Bjorklund (1989) demonstrates that the use of data with panel structure results in an explanatory power of the models, when measured by R^2 , lower than when the database is purely cross-section. The author suggests that the analysis should be centered essentially on the significance levels of the explanatory variables included in the model.

The structural stability of the model has been tested with a Chow test. The value of F -statistic obtained ($F=4.81$), with 1 degree of freedom in the numerator and 394 degrees of freedom in the denominator, allows the rejection of the null hypothesis $H_0: \beta_1=\beta_2=\beta_3=\beta$, at a significance level of 5%. In other words, we accept the alternative hypothesis of a structural change in the model.

The change in the estimated value for the β coefficients is as expected, considering the progressive reduction of the taxation on dividends, in the three time periods. However, considering the equilibrium equation (2), the inexistence of transaction costs, and even admitting a null taxation on capital gains, the theoretical minimum limits for the β coefficients in each of the three time periods are, respectively, 0.789, 0.842 and 0.868⁷.

TABLE IV

Tests on the β coefficients

	1990	1991 to 1993	1994 to 1998
Estimated β	-0.2755	-0.5698	-0.7277
Standard error	0.1275	0.0838	0.1360
Theoretical minimum for β	-0.789	-0.842	-0.868
t -ratio ($H_0: \beta < \text{theoretical minimum}$)	4.032	3.250	1.034
Degrees of freedom	67	122	205
Significancy level	0.0001	0.0015	0.3021

The results in Table IV show that only in the last time period (1994 to 1998) we can not reject the null hypothesis that the β is below its theoretical minimum. For the first two time periods, this hypothesis is not rejected at a significance level of 1%.

This fact can only have two alternative interpretations: either (a) there are other fundamental factors, besides the fiscal factor, that affect the stock price adjustment following a dividend distribution, for example, transaction costs; or (b) this explanation is not sufficient, and the problem lies in the fact that the level of arbitrage activity is incapable of taking the market to a equilibrium point, where

⁷ The theoretical minimum coefficients are calculated from:

$$\beta_i = \frac{P_{an} - P_{ap}}{D} = \frac{1 - t_{di}}{1 - t_{mvi}}, i=1,2,3$$

where:

P_{an} = stock price on the ex-ante day;

P_{ap} = stock price on the ex-post day;

P_c = stock price when acquired;

D = gross dividend;

t_{di} = dividend tax rate, under tax regime i .

t_{mvi} = capital gains tax rate, under tax regime i .

and, considering the most unfavorable scenario of dividend taxation, and the most favorable scenario of capital gains taxation.

no abnormal returns could be exploited, during the dividend period. This second interpretation implies that there is a market anomaly, reflecting an inefficient capital market.

The first interpretation suggests that the exclusion of transaction costs from the model might be responsible, in great measure, for the insufficient stock price adjustment, even after taking into account the fiscality on dividends and on capital gains. Under this, the apparently insufficient stock price adjustment will in fact constitute an equilibrium, because the transaction costs will exceed any abnormal return that could be exploited, due to the non verification of the equation (2). Even though those results are not presented here, the author has verified that, in fact, the normal transaction costs associated with all-round transactions (buy/sell) are enough to erode any abnormal returns. However, abnormal returns could still be obtained by adjusting the timing of transactions, during the dividend period, that is, anticipating buying to dates before the dividend distribution, and postponing selling for after the dividend distribution.

The second interpretation is also appealing, because the Portuguese Stock Market went through substantial changes during the 90's, both at the levels of legislation and organization, the information for investors increased both quantitatively and qualitatively, and the transaction costs were progressively reduced and liberalised. The joint effect of these changes had a positive impact in the organization, in the transparency and in the increase of the market efficiency. In coherence with this evolutionary process, it would be expected to observe an increase of arbitrage activity, leading to an attenuation of the anomaly observed, with the β approaching its theoretical minimum limit, as our results have shown.

4. CONCLUDING REMARKS

The calculation of Elton and Gruber's ratio, based on Portuguese data, results in values below 1. At the light of the theory, this result would be compatible with the existence of a fiscal disadvantage of the dividends, that would justify the only partial stock price adjustment following dividend distributions.

The theoretical minimum limit for this ratio, given the Portuguese fiscality incident on dividends and capital gains is 0.789. Because the empirical value obtained for the correspondent statistic was less than 0.65, the degree of stock price adjustment can not be explained exclusively by fiscal effects. Thus, we have to allow for the possibility that other types of effects are acting on the price adjustment, in the dividend period.

This conclusion was reinforced by the results obtained in the econometric model estimates for three different time periods (tax regimes), characterized by a progressive reduction of the taxation on dividends. The β coefficients estimated for

the three time periods were significantly different from zero, and from each other. Again, all these coefficients are below the theoretical minimums calculated for each tax regime.

However, it is also clear that there was a structural change during the 90's. On the second part of the decade the detected anomaly becomes noticeably less evident, with the degree of stock price adjustment tending to approach the theoretically expected levels.

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