APPLICABILITY OF THE FIRM LIFE CYCLE THEORY OF DIVIDENDS ON CROATIAN CAPITAL MARKET

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Abstract

There is a large number of determinants that affect the decision about dividends. The purpose of this paper is to investigate the influence of determinates that can be assigned to the firm life cycle theory of dividends on company dividend decision on Croatian stock market. The firm life cycle theory of dividends is based on the notion that as a firm matures, its ability to generate cash overtakes its ability to find profitable investment opportunities. Eventually, the optimal choice for the firm is to distribute its free cash flow to shareholders. Linear panel model with random-effects and discriminant analysis is used to investigate applicability of the firm life cycle theory of dividends. Linear panel model is used to identify the determinants of the firm life cycle theory of dividends that are statistically significant and can be applicable on Croatian companies. Results are mixed. Investment possibilities have significant positive effect on dividends which is opposite to the firm life cycle theory of dividends, and the ratio of retained earnings to total equity has a significant positive effect on dividend decisions, which is in contrast to firm life cycle theory of dividends. Discriminant analysis showed that companies that pay and don't pay dividends are significantly different in four of six variables which can be assigned to the firm life cycle theory of dividend.

Key words*: dividends, stock market, firm life cycle theory of dividends*

1. Introduction

Dividends and dividend policy, as one of the crucial corporate policies, have been evolving for centuries. Dividend policy adjusts (in response) to changing business conditions, market parameters and regulations. One of important questions in discussions about dividends is: What determinates the size of cash dividends? This question has vexed economists because companies distribute large amounts of money to shareholders. In the United States (Damodaran, 2015) companies paid out as cash dividends $376 billion in 2013. On Croatian stock market companies paid 0.76 billion HRK which was 0.28% of total market capitalization of all companies listed on Zagreb stock exchange (ZSE).

There is a large number of company characteristics which affect the decision about dividends and the distribution of cash to shareholders. Many studies (see, e.g., Smith and Watts, 1992., Fama, and French, 2001., DeAngelo, DeAngelo and Stulz, 2006., Denis and Osobov, 2008.) have shown that dividends are associated with company's fundamental characteristics such as company's size, growth opportunities, profitability, company maturity and with more discretionary characteristics such as leverage.

The firm life cycle theory of dividends (Baker, 2009) is based on the notion that as a firm matures, its ability to generate cash overtakes its ability to find profitable investment opportunities. Eventually, the optimal choice is for the firm to distribute its free cash flow to shareholders in the form of dividends. According to the firm life cycle theory of dividends, a young firm faces a relatively large investment opportunity set but is not sufficiently profitable to be able to meet all its financing needs through internally generated cash. As a result, the firm will conserve cash by forgoing dividend payment to shareholders. Over time, after a period of growth, the firm reaches the maturity stage in its life cycle. At this point, the firm's investment opportunity set is diminished, its growth and profitability have flattened, systemic risk has declined, and the firm generates more cash internally than it can profitably invest. Eventually, the firm begins paying dividends to distribute its earnings to shareholders.

The recent interest in the life cycle theory of dividends may perhaps be traced to Fama and French's (2001) study of dividend payment behavior of publicly traded U.S. firms. They investigate the patterns and determinants of payout policy over the 1926-1999 period. Their results point to life cycle factors playing a major role in the decision to pay cash dividends. In particular, their findings show that dividend-paying firms are large and highly profitable. These firms have retained earnings that are sufficient to cover their capital investments. On the other hand, firms that have never paid dividends are small and not as profitable as dividend-paying firms.

These firms have many investment opportunities that require external financing because their capital spending is far greater than their earnings. Thus, dividend-paying firms have the characteristics of mature firms, while firms that have never paid dividends have the characteristics of young, fast-growing firms.

DeAngelo et al. (2006) extended the research of Fama and French. In their survey they included the lifecycle of company. They tested the life-cycle theory by assessing whether the probability that the firm pays dividends is positively related to its mix of earned and contributed capital. The earned/contributed capital mix is a logical proxy for the life-cycle stage at which a firm currently finds itself because it measures the extent to which the firm is self-financing or reliant on external capital. Firms with low retained earnings as a proportion of total equity and with low retained earnings as a proportion of total assets tend to be in the capital infusion stage, whereas firms with high retained earnings as a proportion of total equity and as a proportion of total assets tend to be more mature with sufficient cumulative profits that make them largely self-financing, hence good candidates to pay dividends. Their evidence suggests that the fact which distinguishes dividend payers from non-payers is the mix of internal and external capital. Dividend payers tend to have high earned equity relative to contributed capital and non-payers tend to have low earned equity relative to contributed capital.

Research of Denis and Osobov (2008) confirmed the above mentioned researches that likelihood of dividend payments is positively associated with company size, profitability and with company maturity. They extended previously mentioned surveys by examining cross-sectional evidence on the propensity to pay dividends in several developed financial markets (the United States, Canada, the United Kingdom, Germany, France and Japan). In addition, they saw that in all six countries, the propensity to pay dividends is strongly associated with the ratio of retained earnings to total equity (the earned/contributed capital mix). The fraction of companies that pay dividends is high when company's equity consists primarily of retained earnings and is low when retained earnings are negative.

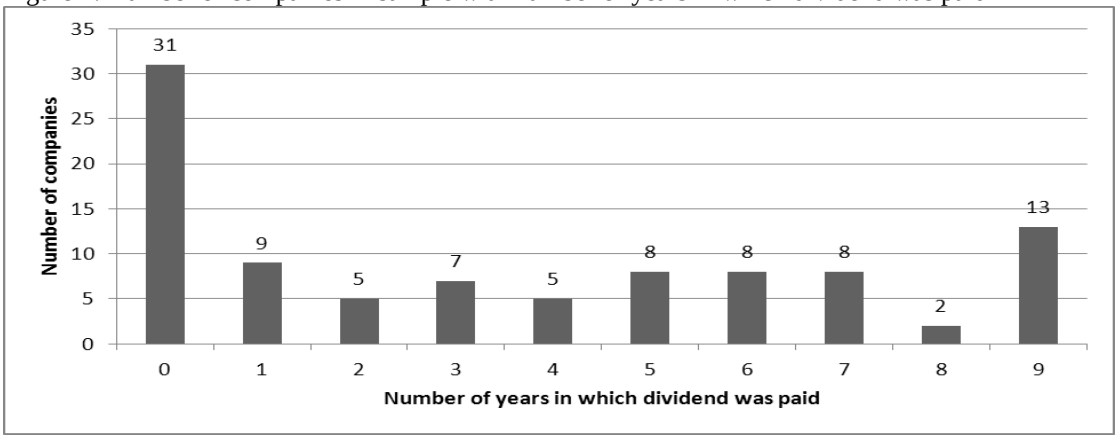
Von Eije and Meggison (2008) examined dividend and repurchase policy in 15 nations that were members of the European Union (EU) before May 2004. They noted that dividend and share repurchase policies of EU companies are similar in many ways to those of companies from the United States. The fraction of European companies which pay dividends has also declined in the last years of 20th century as it is happened in the United States.

Von Eije and Meggison (2008) found that older EU companies are more likely to pay cash dividends than younger companies and also older companies pay higher cash dividends. These findings are similar to findings of above mentioned authors who were investigating dividend policy of companies from the United States. In addition, they came to the conclusion that privatized companies in EU that pay cash dividends also pay more than comparable companies that were never state owned. The distinction between the probability to pay and amount of dividends is relevant, privatized companies are not more likely to pay dividends than always private companies, but they pay more if they do pay. The paper consists of four main parts. The first one is the introduction. The second part sets the research basis, describes the sample selection an data used in the research. The second part consists of descriptive statistics of variables explored. The third part of the paper presents the results of the research, while the fourth section holds the conclusion.

2. Sample Selection And Data Description

Basic population from which the sample is taken presents companies listed on Zagreb Stock Exchange in the period from the year 2003 to year 2011. As mentioned, the main goal of this paper is to investigate the influence of determinates which can be assigned to the firm life cycle theory of dividend on company dividend decision on Croatian stock market. The research included companies which paid and didn't pay dividend. Total number of companies in the research amounts to 96. 31 of 96 companies (32%) didn't pay at all dividends in the period between 2003 and 2011. Other 65 companies paid at least one dividend.

Figure 1: Number of companies in sample with number of years in which dividend was paid



Source: author's research

As seen in figure 1, 13 companies had paid dividend each year in the observed period (2003-2011). 9 companies paid the dividend only once in observed period.

Linear panel model with random effects was used to investigate which determinants of the firm life cycle theory of dividends are statistically significant and can be applicable on Croatian companies. Research was made in statistical software STATA. Dividend decision as depended variable is defined by dividend payout ratio ($DPR_{i,t}$) of company *i* in the year *t*. Calculation of DPR is shown with equitation 1.

$$DPR_{i,t} = \frac{DPS_{i,t}}{EPS_{i,t}} \quad (1)$$

DPS stands for dividend per share and EPS stands for earning per share. The dividend payout ratio indicates the percentage of profits distributed by the company among shareholders out of the net profits, or what remains after subtracting all costs from a company's revenues. The dividend payout (Al-Kuwari, 2009) takes into consideration both dividend payout and dividend retention and it's better to use rather than dividend per share and dividend yield. Dividend per share and dividend yield is considered unsuitable, because neither takes into account the dividend paid in relation to the income level. It may also be true that the dividend yield model is considered a measure of firm value and a return to shareholders, and therefore, it may not necessarily be related to firm life cycle theory of dividend.

Independent variables of firm life cycle theory of dividend used in the research are earned equity to total common equity of company *i* in the year *t* ($RE_{i,t/}TE_{i,t}$), earned equity to total assets ($RE_{i,t/}TA_{i,t}$). Investment opportunities are shown with three variables: relative sales growth ($SG_{i,t}$) of company *i* in the year *t*, market to book ratio ($MV_{i,t/}BV_{i,t}$), of company *i* at the end of year t, relative growth of total asset ($TAG_{i,t}$), of company *i* in the year *t* and size of company *i* in at the end of year *t* measured as natural logarithm of book value of total asset ($lnTA_{i,t}$). Table 1 shows descriptive statistics of depended variable and independent variables.

Table 1: Descriptive statistics

Variable	Observation	Mean	Std. Dev.	Min	Max
DPR	785	.3044459	.9616209	-1.11	19.13
TVKV	749	1.249.266	1.679.823	-11.18	15.94
SG	772	.5923136	129.321	-.891	358.25
TAG	779	.0820195	.2549401	-.6225	35.317
RETE	785	.1545171	.2613398	-10.222	.9891
RETA	785	.2313772	1.188.029	-180.138	149.235
lnTA	785	1.146.645	1.176.509	0	152.709

Source: author's research

Average dividend payout ratio for all companies (including companies which didn't pay dividend) in the sample taken from Zagreb stock exchange is 30,44%. Unusual data is that average proportion of retained earnings in total asset is lower than average proportion of retained earnings in total equity.

3. Empirical Results

The first model used is linear panel model with random-effects. Linear panel model is used to investigate what determinants of the firm life cycle theory of dividends are statistically significant and can be applicable to Croatian companies. After the linear panel model, discriminant analysis is used to investigate if there are differences in variables which can be assigned to the firm life cycle theory of dividends between dividend paying and nonpaying companies.

3.1. Applicability Of The Firm Life Cycle Theory Of Dividends

Linear panel model with random effects was used to investigate what determinants of the firm life cycle theory of dividends are statistically significant and can be applicable to Croatian companies. Dividend decision is described by dependent variable dividend payout ratio (DPR) while independent variables in model are: earned equity to total common equity ($RE_{i,t/}TE_{i,t}$), earned equity to total assets ($RE_{i,t/}TA_{i,t}$), sales growth ($SG_{i,t}$), market to book ratio ($MV_{i,t/}BV_{i,t}$), relative growth of total asset ($TAG_{i,t}$), size of company ($lnTA_{i,t}$).

The first step in research was to investigate if the problem of multicollinearity is present between independent variables. The problem is present if the coefficient between variables is greater than 0,7. Results are shown in table 2. There is no problem of multicollinearity and each independent variable can be used in research.

Table 2: Correlation matrix

	TVKV	SG	TAG	RETE	RETA	lnTA
TVKV	1					
SG	-0,0032	1				
TAG	0,1650	0,0430	1			
RETE	-0,0270	-0,0558	0,0455	1		
RETA	-0,4253	-0,0422	-0,0320	0,3241	1	
lnTA	0,1077	0,0281	0,0986	0,0858	0,0351	1

Source: author's research

Results of linear panel model are shown in table 3.

Table 3

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Random-effects GLS regression                   Number of obs      =       737
Group variable: ID_compa                        Number of groups   =        95

R-sq:  within  = 0.0055                         Obs per group: min =         4
       between = 0.1328                                        avg =       7.8
       overall = 0.0345                                        max =         9

Random effects u_i ~ Gaussian                   Wald chi2(6)       =     15.52
corr(u_i, X)       = 0 (assumed)                Prob > chi2        =    0.0166

------------------------------------------------------------------------------
         DPR |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        TVKV |   .0430749    .017839     2.41   0.016     .0081112    .0780387
          SG |  -.0001222   .0018625    -0.07   0.948    -.0037726    .0035282
         TAG |  -.0735967   .1026102    -0.72   0.473     -.274709    .1275155
        RETE |   .3322346    .128033     2.59   0.009     .0812945    .5831748
        RETA |   .0254247   .0263137     0.97   0.334    -.0261493    .0769987
        lnTA |  -.0438969   .0267914    -1.64   0.101     -.096407    .0086132
       _cons |   .6792756   .3076951     2.21   0.027     .0762043    1.282347
-------------+----------------------------------------------------------------
     sigma_u |  .24764984
     sigma_e |  .64100885
         rho |  .12987607   (fraction of variance due to u_i)
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Source: author's research

Results of linear panel model are mixed. Investment possibilities have significant positive effect on dividends which is opposite to the firm life cycle theory of dividends, and ratio of retained earnings to total equity has a positive significant effect on dividend decisions which is in accordance to firm life cycle theory of dividends. Companies with higher proportion of retained earnings are mature companies which are usually externally financed so they are in possibility to pay higher amount of dividend. Positive bond between investment possibilities and dividends for companies on ZSE can be explained by dividend signaling theory. The basis of the signaling theory (Miletić, 2011) is information asymmetry which exists on market and represents an unequal access to information between managers and stockholders. The presumption on which this theory is based is the possibility of reducing information asymmetry by dividends which are used by insiders when they want to signal company situation. The concept of signaling theory originates in the work of Lintner (1956), who demonstrated how stock price often reacts to dividend changes. The idea according to which a dividend could be used as a signal of company's business is established among financial directors of large companies in the USA. Abrutyn and Turner (1990) made a survey of financial directors of large companies in the USA in which 63% of examinees stated signaling to be the first or the second most likely reason to make dividend payout.

The life cycle theory of dividends (Baker, 2009) predicts that a firm will begin paying dividends when its growth rate and profitability are expected to decline in the future. This is in sharp contrast to the signaling theory of dividends, which predicts that a firm will pay dividends to signal to the market that its growth and profitability prospect have improved.

3.2. Discriminant Analysis

The main goal of discriminant analysis is to investigate if there are statistically significant differences in defined variables of the firm life cycle theory of dividends between dividend paying and nonpaying companies. Variables taken in research are the same as variables used in linear panel model. Discriminant analysis builds a predictive model for group membership (one group consists of companies which paid dividend, and the other of companies which didn't pay dividend). The model is composed of a discriminant based on linear combinations of the predictor

variables that provide the best discrimination between the groups. If discriminant analysis defines variables (in this case variables that can be assigned to the firm life cycle theory of dividends) which are statistically significant we are able to distinguish companies between these two groups (group of companies which paid or did not pay dividend). This puts us in position to determine which of the variables assigned to the firm life cycle theory of dividend have greater impact on dividend decision.

To serve the needs of discriminant analysis companies are divided in two groups. Group 1 consists of companies that paid dividend (DPR>0) and group 0 consists of the companies that didn't pay dividend (DPR=0). The predictor variables that provide the discrimination between the groups are earned equity to total common equity ($RE_{i,t}/TE_{i,t}$), earned equity to total assets ($RE_{i,t}/TA_{i,t}$), sales growth ($SG_{i,t}$), market to book ratio ($MV_{i,t}/BV_{i,t}$), relative growth of total asset ($TAG_{i,t}$), size of company ($lnTA_{i,t}$). Results of discriminant analysis are shown hereinafter.

Table 4 shows descriptive statistic for each group. Companies which paid dividends (group 1) have greater average means (greater value) in each variable which is assigned to the firm life cycle theory of dividends except sales growth ($SG_{i,t}$). There are also not many differences in the variable- size of company ($lnTA_{i,t}$).

Table 4: Group Statistics

DPR		Mean	Std. Deviation
0 (DPR=0)	TVKV	0,9556	1,56082
	SG	0,9269	17,42284
	TAG	0,0653	0,21544
	RETE	0,0721	0,24877
	RETA	0,0765	1,47327
	lnTA	11,4469	1,43259
1 (DPR>0)	TVKV	1,6273	1,76941
	SG	0,1737	1,50801
	TAG	0,0989	0,27897
	RETE	0,2916	0,18742
	RETA	0,5080	0,24516
	lnTA	11,4908	1,32168

Source: author's research

Table 5 presents the test of equality of group means. Wilks' lambda is a test statistic used in multivariate analysis of variance to test whether there are differences between the arithmetic means of identified groups (group 1 and group 0) of subjects for a combination of dependent variables (in this case variables which can be assigned to the firm life cycle theory of dividend). If the group means are equal, then Wilks' lambda value is 1. If the Wilks' lambda is less than 1 it means that most of variation can be attributed to differences between the groups. Statistical affirmation of descriptive statistics shown in table 4 derives from results of tests of equality of group means.

Table 5: Tests of Equality of Group Means

	Wilks' Lambda	F	df1	df2	Sig.
TVKV	0,961	30,151	1	743	,000
SG	0,999	0,598	1	743	,440
TAG	0,995	3,437	1	743	,064
RETE	0,809	175,076	1	743	,000
RETA	0,965	27,047	1	743	,000
lnTA	1,000	0,183	1	743	,669

Source: author's research

Results in table 5 show that arithmetic means of variables earned equity to total common equity ($RE_{i,t}/TE_{i,t}$), earned equity to total assets ($RE_{i,t}/TA_{i,t}$), market to book ratio ($MV_{i,t}/BV_{i,t}$), relative growth of total asset ($TAG_{i,t}$) are statistically significant. It means there are differences between companies which paid and did not pay dividend in those variables. Arithmetic means for variables sales growth ($SG_{i,t}$) and size of company ($lnTA_{i,t}$) are not statistically significant and these groups of companies are not different when examining these variables.
Table 6 shows the analyzed discriminant power. If Wilks' lambda is statistically significant this means that model is discriminating the dividend paying and companies which don't pay dividends. If Wilks' lambda is not statistically significant further analysis should be stopped. Wilks' lambda indicates the significance of the discriminant function. Table 6 indicates a highly significant function ($p < 0,000$)

Table 6: Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1	,739	223,878	6	,000

Source: author's research

Table 6 indicates a highly significant function ($p < 0,000$). This means that arithmetic means of analyzed groups are different and this model classifies well the variables of the firm life cycle theory of dividends.
Classification results are shown in table 7. Discriminant analysis accuracy is 74,9%. It means that 74,9% (or 558 of 745) cases were well classified in the appropriate group.

Table 7: Classification Results[a]

DPR			Predicted group membership		
			0	1	Total
Original	Count	0	329	94	423
		1	93	229	322
	%	0	77,8	22,2	100,0
		1	28,9	71,1	100,0

[a] 74,9% of original grouped cases correctly classified.

Source: author's research

From total number of dividend paying companies (group 1) this model classified 229 cases of total 322 cases in matching groups and in this case the accuracy was 71,1%. For dividend nonpaying companies (group 0) the model classified with accuracy of 77,8%, or 329 of 423 cases in the appropriate group.

4. Conclusion

In this paper linear panel model and discriminant analysis were used in investigation of applicability of the firm life cycle theory of dividends on ZSE (Croatian capital market).

Results of linear panel model are mixed. Ratio of retained earnings to total equity has a positive significant effect on dividend decisions which is in accordance to firm life cycle theory of dividends. Companies with higher proportion of retained earnings are mature companies which are usually externally financed so they are in possibility to pay higher amount of dividend. Investment possibilities have significant positive effect on dividends which is opposite to the firm life cycle theory of dividends. Positive bond between investment possibilities and dividends for companies on ZSE can be explained by dividend signaling theory according to which a dividend could be used as a signal of company's business.

Performed discriminant analysis shows that on the basis of variables that can be assigned to the firm life cycle theory of dividend we are able to distinguish between companies that paid dividends in comparison to companies that didn't pay dividends. Statistical significance of Wilks' lambda as measure for discriminant power is <0,000. This means that arithmetic means of analyzed groups are different and this model classifies well the variables of the firm life cycle theory of dividends. Statistically significant financial ratios which we can use to make distinction are earned equity to total common equity ($RE_{i,t}/TE_{i,t}$), earned equity to total assets ($RE_{i,t}/TA_{i,t}$), market to book ratio ($MV_{i,t}/BV_{i,t}$), relative growth of total asset ($TAG_{i,t}$) are statistically significant. It means there are differences between companies which paid and didn't pay dividend in those variables. Discriminant analysis accuracy of the model was 74,9%.

Dividend policy as one of the central financial questions presents an interesting field for many researchers and field in which many questions are still not answered. Research in this paper was done on Zagreb Stock Exchange, relatively small stock market which is still in process of growing and evaluating. So far, few works on dividend policy theme were done on Zagreb stock exchange, therefore this paper presents a contribution to better understanding dividend policy of companies listed on ZSE.

Biography

Marko Miletić, Ph. D., is a senior lecturer at University Department of Professional Studies in Split where he gives lectures in courses of Corporate Finance 1, Corporate Finance 2, Income Tax and Investment Project Evaluation. At the same Department he is a Deputy Head of Department for Finance and Accounting. He is the author of a few scientific and professionals papers which deal with the problems from various areas of corporate finance.

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