

# Internal factors of dividend policy in public firms in Bosnia and Herzegovina

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## Abstract

This paper examines the characteristics of dividend paying firms in Bosnia and Herzegovina. The research is conducted on a sample of 35 largest public firms during the period of five years, from 2013 to 2017, using multiple linear regression and logistic regression. The aim of the research is to explore the internal determinants of dividend payouts and to find whether there are any deviations from empirical experiences in the world. The research results show that larger and more profitable firms are more likely to pay dividends, while more indebted and closely held firms are less likely to pay dividends. The negative relation found between the dividend decision and investment opportunities is not statistically significant. The research results also show that the size is positively associated with higher payout ratios, while the payout ratios decrease with greater use of financial leverage. Profitability, investment opportunities and ownership concentration do not affect the level of dividend distribution.

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## Introduction

Analyzing the phenomenon of dividends, Black (1976) famously stated: "The harder we look at the dividend picture, the more it seems like a puzzle, with pieces that just don't fit together". Incentive for such a statement probably came from conflicting theoretical perspectives and mixed results of previous empirical research regarding the link between dividends and firm value. However, vast number of previous research identified the main characteristics of dividend paying firms - profitability, size, growth opportunities, leverage, and ownership concentration. Even though research results were not uniform, profitability and size in general have a positive effect on the level of dividends, while the leverage, growth opportunities and ownership concentration have a negative effect on dividend distribution. The purpose of this paper is to verify those findings in case of Bosnia and Herzegovina by analyzing the internal factors of dividend policy in the public firms listed on the Sarajevo and Banja Luka Stock Exchange. The paper is organized as follows: The first part presents a review of the

literature and the previous empirical research of the internal factors of dividend policy. The second part of the paper describes the design of the sample, the sources of data and the choice of the research methods. The third part of the paper presents descriptive statistics as well as hypothesis testing results. The fourth part of the paper presents the main conclusions that have been explored, while the fifth part lists the literature used.

## Literature review

According to literature, the most important internal factors of dividend policy are profitability, size, growth opportunities, indebtedness of the company and ownership concentration. Even though the effects of these factors are not geographically consistent, as stated above, profitability and size in general have positive effects on dividends while the leverage, growth opportunities and ownership concentration negatively affect dividend decision. A detailed review of the previous research results regarding the internal determinants of dividend policy is given below.

Retained and current earnings are the basic accounting sources for dividends, and it is intuitively expected that the growth in earnings *per se* will be followed by the growth of dividends. This is confirmed by numerous empirical studies. Lintner (1956) examined the dividend policy of 28 major US firms and found that current earnings and previous year's dividends are main determinants of actual dividends. Fama and Babiak (1968) also came to this conclusion on a sample of 392 industrial firms in United States through the period from 1946 to 1964. They have pointed out that current earnings are better indicator of profitability compared to cash flow or net profit plus depreciation, included in the model as a separate variable. These findings are consistent with signalling theory that states that profitable firms will pay dividends in order to signal good business prospects (Bhattacharya, 1979).

The importance of earnings for dividend decision is also confirmed through a number of surveys. Baker et al. (1985) conducted a survey in 318 firms from the New York Stock Exchange and found that the most important factors of dividend payouts were the expected earnings and the historical dividend payout pattern. Similar conclusions were reached in a survey of NASDAQ firms conducted by Baker et al. (2001). Furthermore, investigating factors that influence dividend decision on a sample of 384 financial directors in 256 US firms Brav et al. (2005) found that dividend decision is in the range with investment decision, while the stock buybacks are made from the residual cash flow after investments. In addition, the authors found that the perceived stability of future earnings is still an important factor of dividend policy even though the link between earnings and dividends has faded over time. The reason for this, as authors pointed out, is that majority of directors favour the stock buybacks over dividends as a more flexible option of earnings distribution.

Apart from profitability as main determinant of dividend payout, numerous empirical studies suggest that dividend decision is also affected by other financial factors like investment opportunities, size, and leverage. Rozeff (1982) found that higher investment opportunities (growth rate of revenues) are associated with lower dividend payouts. This is in line with pecking order theory (Myers, Myluf, 1984) that refers to a hierarchy-based approach to financing in which retained earnings are considered as the cheapest source of funds. Therefore, firms with strong investment opportunities i.e. firms in the early phase of life-cycle are more likely to retain higher portion of earnings and therefore pay lower dividends (DeAngelo, DeAngelo, Stulz, 2006). Rozeff (1982) also found negative relation between firm leverage (beta coefficient) and dividends. The reason for this is contractual obligation to pay interest on debt thus reducing available cash flow to pay dividends. Furthermore, higher

portion of debt in firm capital structure leads to higher financial risk. Therefore, retention of earnings is often perceived as a protection against default risk. Lloyd et al. (1985) investigated the relationship between the dividend payouts and the firm characteristics identical to those used by Rozeff (1982) adding the size of the firm as an additional factor for dividend payout. The results of the research have shown a positive link between the firm size and the dividend payouts. Holder, Langrehr and Hexter (1998) also investigated the determinants of dividend policy on a sample of 477 US firms in the period from 1983 to 1990. They have documented a strong link between the dividend payout ratios and the size of the firm measured by the logarithm of the sales revenue. The reason for this is that bigger firms usually have easier access to the capital markets what makes them less sensitive on internal source of financing and allows them to pay higher dividends. This is in line with life cycle theory of dividends because as firms grow mature they tend to have higher portion of retained earnings in total capital what makes them good candidates for dividend payout due to better profitability and weaker investment opportunities (DeAngelo, DeAngelo, Stulz, 2006). Moreover, a study conducted by Fama and French (2001) showed declining percentage of dividend payers among publicly listed firms due to decreasing propensity to pay dividends and growing portion of small firms with low profitability and strong growth opportunities that are typical characteristics of non-payers. By using logistic regression, they assigned higher probability of dividend payout to firms with higher profits and lower growth opportunities.

Similar conclusions regarding the link between dividends and firm level factors like profitability, size, leverage, and investment opportunities were reached in empirical studies of dividend policy across Europe. However, some researchers found mixed results across different countries. Hedensted and Raaballe (2006) examined the dividend policy in Denmark and found that typical characteristics of dividend payers are: large firm size, positive earnings, high and stable ROE, high retained earnings and the fact that firm paid out dividends in the previous year. Statescu (2006) studied the factors of dividend policy in Switzerland and documented that price volatility, market-to-book ratios, and leverage are negatively associated with dividend payouts, while profitability, firm size and institutional holdings positively affect the level of dividends. Kowalewski, Stetsyuk, and Talavera (2007) investigated dividend determinants in Poland and found that larger (log of total assets) and more profitable (ROA) firms without solid investment outlook pay more dividends, while more indebted firms (ratio of long term debt to assets) and those with better investments (Tobin's q) pay lower dividends. Gugler and Yurtoglu (2003) documented significant negative influence of firm's size (log of total assets) and leverage (debt to total assets) on dividend payout ratios (total dividends divided by income before extraordinary items) among German firms. Negative link found between dividend payout ratios and investment opportunities (Tobin's q) was not significant. Kožul and Orsag (2012) examined the determinants of dividend policy in Finland, France, Poland, Netherlands, United Kingdom, Australia, USA and Japan. They have found significant positive influence of profitability (ROA) and stability of earnings (log of standard deviation of ROA) on dividend payout levels, while the growth opportunities and ownership concentration had negative effect. Results regarding the influence of debt and size were inconsistent across countries. Kožul and Mihalina (2013) examined the dividend determinants of publicly listed firms in Croatia and documented that payout ratios are associated with higher levels of profitability and lower levels of debt, while stability of earnings and firm size effects were not statistically significant.

Similar results were reached in the rest of the world. Bebczuk (2004) explored characteristics of dividend payers in Argentina on a sample of 55 firms in the period

1996-2002. He found that bigger (log of sales) and more profitable firms (return on assets – ROA) without good investment opportunities (Tobin's q) distribute higher dividends, while riskier and more indebted firms (debt to assets ratio) pay lower dividends. Aivazian, Booth and Cleary (2003) have explored the dividend policy of firms in developing countries (South Korea, Malaysia, Jordan, Turkey, Pakistan, India, Thailand and Zimbabwe). They have documented that profitability (ROE) positively affects dividend payout ratios (the ratio of total dividends and assets) in all of the analyzed countries, while debt and payout ratios move in the opposite direction. Unexpectedly, research has shown a positive relationship between dividend payments and the market to book ratio as an approximation of the present value of growth opportunities. Negative link between the dividend payout ratios and the size of tangible assets found among emerging countries was also surprising having in mind previous studies that resulted in positive effects of firm size. However, authors concluded that same factors affect dividends decision in emerging countries as well as in United States, while magnitudes of these effects are different. Payout ratios of emerging market firms are more sensitive to levels of debt indicating stronger financial constraints in emerging countries due to a greater reliance on bank debt (Aivazian, Booth, Cleary, 2003). The same is true for profitability – payout ratios of emerging market firms are more responsive to changes of ROE. Denis and Osobov (2007) also investigated the internal factors of dividend policy in six countries (USA, United Kingdom, Canada, France, Germany and Japan) during the period from 1994 to 2002. They have shown that profitable firms (measured as the ratio of earnings before interest and book value of total assets and as the ratio of after-tax earnings to book value of equity) are more likely to pay dividends. The same effect was found between book value of total assets, as proxy for firm size, and dividend payout ratios. However, the link between dividends and growth opportunities has not been consistent across countries. Firms in the United States, Canada and the United Kingdom were more likely to pay out dividends as they had fewer growth opportunities, while in the case of Germany, France and Japan, higher growth opportunities were characteristic of firms that paid more dividends. Authors used the market to book value and the percentage change in total assets as indicators of growth opportunities.

However, dividend determinants are not exclusively financial. According to agency theory, dividend decision is also affected by ownership structure. From the agency theory perspective, ownership concentration and dividend distribution can be viewed as substitutes. Jensen and Meckling (1976) argue that managers often tend to pursue their own goals at the expense of the stockholder's interests. In order to minimize agency costs shareholders will strive to prevent misuse of free cash flow. This can be done by using legal mechanisms to force dividend payouts or by increasing the ownership stake to gain more control over management actions. As Shleifer and Vishny (1997) emphasized - the most effective way to match cash flow and control rights of outside investors is to increase holdings. So, one can expect that firms with higher ownership concentration will pay lower dividends because increased control enables them full "consumption" of ownership rights. This was observed by Rozeff (1982) who found that higher inside ownership is associated with a reduced dividend payout ratio. Similar results were presented by Gugler and Yurtoglu (2003), as well as Kowalewski, Stetsyuk and Talavera (2007), who documented that bigger stake of the largest owner is related to lower dividend payout ratio, while the larger holding of the second largest owner is linked to higher dividend pay-out ratio. Kožul and Orsag (2012) also documented negative relation between dividend payouts and ownership concentration measured by the holdings of the larger shareholder. On the other hand, if shareholders do not have a significant portion of ownership they can demand

dividends to reduce the likelihood of irrational spending, especially in countries with strong investor protection. This was confirmed by study of La Porta et al. (2000) who found that dividends are output of strong investor protection i.e. higher dividend payout ratios are found in countries with stronger investor protection. This is also in line with earlier works of La Porta et al. (1998, 1999) who documented that countries with stronger investor protection have more dispersed ownership structure.

## Research data and methodology

The final research sample consists of the 35 largest nonfinancial firms listed on the Sarajevo and Banja Luka Stock Exchange. Research period is five years (2013-2017). All publicly listed nonfinancial firms with market capitalization higher than 10 million BAM, that have minimum of 30 shareholders, available accounting data for entire research period and positive book capital entered the sample. Sample selection process according to the research criteria is presented in table 1.

Table 1 Number of analyzed firms by stock exchanges

<b>1</b>	<b>Sarajevo Stock Exchange</b>
55	Number of firms with market capitalization greater than 10 million BAM
-17	Financial firms
-8	Less than 30 shareholders
-6	Inconsistent or missing accounting data
-2	Negative book capital
<b>22</b>	<b>Number of analyzed firms listed on Sarajevo Stock Exchange</b>
<b>2</b>	<b>Banja Luka Stock Exchange</b>
28	Number of firms with market capitalization greater than 10 million BAM
-12	Financial firms
-1	Less than 30 shareholders
-1	Inconsistent or missing accounting data
-1	Negative book capital
<b>13</b>	<b>Number of analyzed firms listed on Banja Luka Stock Exchange</b>
<b>35</b>	<b>Final sample – total (1+2)</b>

Source: Authors' creation.

Financial firms are excluded from the sample due to unique operating characteristics and specific regulatory framework. Furthermore, firms with less than 30 shareholders are excluded from the sample because they cannot be considered as true public firms. Inconsistent accounting data refers to cases with missing or distorted data on research variables. Firms with negative book capital are also excluded from the sample due to violation of going concern assumption. For the research purposes, a binary logistic regression is used. The dependent variable is binary and equals 1 if a firm pays dividend in year  $t$ , and 0 otherwise. Independent research variables are profitability, size, investment opportunities, leverage, ownership concentration and government ownership.

Government ownership is included as additional control variable due to a large portion of firms with significant stake held by government entities and institutions. In addition, linear regression is used to test how these factors influence payout ratios among dividend payers. Variable definitions and hypothesized signs between dependent and independent variables are given in table 2.

Table 2 Variables in regressions

Variable name	Variable definition	Hyp. sign
Dividend payer	1 for payers, 0 otherwise (PAYER)	
Payout ratio	Dividends to earnings ratio (DIV PR)	n.a.
Profitability	Return on equity (ROE)	+
Size	Natural logarithm of total assets (LSIZE)	+
Leverage	Ratio of total liabilities to total assets (LEVERAGE)	-
Growth opportunities	Sales revenue growth rate (SGROWTH)	-
Ownership concentration	Percent of holdings by top 5 shareholders (TOP5)	
Government ownership	1 for government owned, 0 otherwise (GOV)	-

Source: Authors' creation.

Profitability is measured by return on equity (ROE), size by the logarithm of total assets (log of total assets), growth opportunities by growth rate of sales revenue, leverage by the ratio of liabilities to total assets and ownership concentration by percentage of ownership held by top 5 shareholders. A firm in which government has more than 50% ownership rights equals 1 and 0 otherwise. Financial data are extracted from annual reports of the analyzed firms. Additionally, ownership data are collected from Registry of securities of Federation of Bosnia and Herzegovina and Central Registry of Securities of Republic of Srpska.

## Results and discussion

Table 3 (and figure 1) presents frequencies of dividend paying and non-paying firms as well as average payout ratios across years. Adjusted payout ratio is the ratio of dividends to earnings excluding observations with payout ratios greater than one i.e. distribution of dividends from retained earnings in previous years (in some cases even before sample period). As table 3 shows, portion of dividend payers varies from 26% in 2013 to 37% in 2014, with overall average of 30%. Those payers on average distributed large portion of earnings to their shareholders (even if payout ratios above one are excluded). The average adjusted payout ratio is 59% which is significantly higher than 5-year average payout ratio of S&P 500 firms of 38% (Damodaran, 2019a). This is the opposite of Glen et al. (1995) who found that dividend payout ratios in emerging markets are only two thirds of those in developed capital markets. Moreover, including those observations with payout ratio greater than one, average payout ratio increases to level of 378%.

Table 4 summarizes the descriptive statistics of the research variables for dividend payers and non-payers. Firm year observations with payout ratio greater than 1, as well as those observations with negative earnings are excluded. Return on equity (ROE) as proxy for profitability is significantly greater among dividend payers. However, this is much lower compared to average ROE of S&P 5000 nonfinancial firms, which is 16.88% (Damodaran, 2019b). Moreover, at these levels of ROE majority of the most profitable public firms in Bosnia and Herzegovina do not add value to their shareholders (Orsag, Džidić 2018a, 2018b). They found that most of the analyzed firms did not earn enough to cover the cost of principal and therefore lost value for their stockholders.

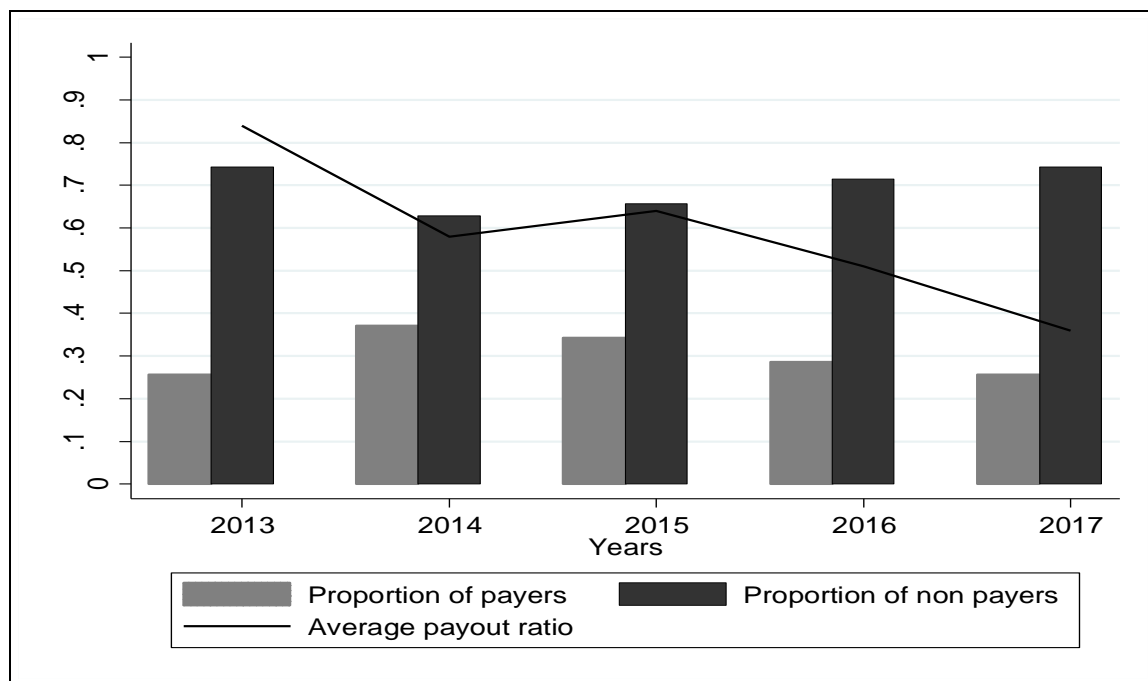


Figure 1 Proportions of payers and non-payers, and average payout ratios across years

Source: Authors' creation.

Table 3 Frequencies of dividend payers across years

	Year					Total
	2013	2014	2015	2016	2017	
No. of dividend paying firms	9	13	12	10	9	<b>53</b>
% of total firms	0.26	0.37	0.34	0.29	0.26	<b>0.30</b>
Mean payout ratio	2.30	2.82	1.51	0.76	13.01	<b>3.78</b>
Mean adjusted payout ratio	0.84	0.58	0.64	0.51	0.36	<b>0.59</b>
S&P mean payout ratio	0.33	0.34	0.43	0.43	0.39	<b>0.38</b>
No. of non-dividend paying firms	26	22	23	25	26	<b>122</b>
% of total firms	0.74	0.63	0.66	0.71	0.74	<b>0.70</b>
<b>Total number of firms</b>	<b>35</b>	<b>35</b>	<b>35</b>	<b>35</b>	<b>35</b>	<b>175</b>
<b>Total%</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

Source: Authors' calculation based on data from financial reports and Damodaran (2019a).

Variable size, measured by the total assets of the firm is also significantly higher for dividend payers versus non-payers, which means that smaller firms are less likely to pay dividends. These results follow the pecking order theory of Myers and Majluf (1984) who show that firms often refuse to raise capital and forego valuable investment opportunities due to asymmetric information or higher transaction costs. Reasoning behind this fact is that raising capital is more expensive for smaller firms so they will rely on internal sources thus reducing the likelihood to pay dividends.

Table 4 presents aggregate descriptive statistics of the research variables, while tables containing descriptive statistics for each year separately are provided in Appendix 1.

As expected, growth rate of sales, as proxy for investment opportunities, is two times higher across non-payers (8%) versus dividend payers (3%). Combined with fact that profitable firms pay more dividends these results are aligned with the agency theory of Easterbrook (1984) and Jensen (1986) who emphasize the role of dividends in reducing the agency costs.

Table 4 Descriptive statistics of the research variables

<b>Payers</b>					
<b>Variable</b>	<b>Obs.</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
Payout ratio	43	0.59	0.36	0.04	1.00
Return on equity	43	0.09	0.11	0.001	0.57
Return on assets	43	0.07	0.07	0.0009	0.37
Total assets (in mln BAM)	43	612.29	862.18	31.76	3,406.49
Total liabilities / total assets	43	0.14	0.11	0.00	0.36
Top 5 shareholders	43	0.80	0.17	0.48	0.99
Top 1 shareholder	43	0.55	0.25	0.14	0.93
Growth of sales	36	0.03	0.17	-0.30	0.60
<b>Non-payers</b>					
<b>Variable</b>	<b>Obs.</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
Payout ratio	89	-	-	-	-
Return on equity	89	0.04	0.06	0.0001	0.38
Return on assets	89	0.03	0.07	0.0001	0.59
Total assets (in mln BAM)	89	213.91	436.47	3.55	3,398.58
Total liabilities / total assets	89	0.26	0.22	0.001	0.79
Top 5 shareholders	89	0.87	0.14	0.38	0.99
Top 1 shareholder	89	0.63	0.20	0.10	0.95
Growth of sales	70	0.08	0.28	-0.44	0.97

Source: Authors' calculation based on data from financial reports.

Like investment opportunities, dividend-paying firms are significantly less indebted than non-payers are. However, debt figures show that public firms in Bosnia and Herzegovina are, in general, mainly financed by equity rather than debt despite the fact that bank average interest rates have been at the lowest levels in the last five years (Banking Agency of the Federation of Bosnia and Herzegovina, 2019). Moreover, Orsag and Džidić (2018a) documented the poor use of financial leverage among the most profitable public firms in Bosnia and Herzegovina. They found that 10 out of 30 profitable firms, do not use debts at all, neither long-term nor short-term. On the total value of the principal come only 7.84% of the debt, equally divided between long-term and the short-term debt.

By looking at Table 4 it is easy to see that majority of public firms in Bosnia and Herzegovina are closely held. Average percentage of holdings of top 5 shareholders is very high among payers and non-payers (above 80%), while the biggest shareholder on average holds more than 50% of shares in both groups of firms. However, top 5 holdings are slightly higher among non-payers. High ownership concentration is direct consequence of slow pace of privatization process launched in late 1990s. According to ownership data, the government controls (over 50% ownership rights) 49% of dividend payers. Having in mind weak investor protection enforcement, statistics presented here also points to possibility of free cash flow expropriation by controlling owner at the expense of outside shareholders. Therefore, it is possible that ownership concentration among firms without significant government stake acts like substitute for weak investor protection.

Differences between payers and non-payers are also visible on annual basis. Payers have higher ROE in four out of 5 years, while ROA is higher for payers in each year. Furthermore, payers are consistently bigger (total assets) than non-payers throughout the whole research period. In contrast, dividend payers have lower investment opportunities (sales growth) and lower leverage (debt ratio) in each of the sample years. Similarly, ownership concentration measured by top five shareholders and by the biggest shareholder is higher for non-payers in four out of 5 years (see descriptive



statistics for each year in Appendix 1 displayed in tables A1, A2, A3, A4 and A5 for payers, and A6, A7, A8, A9 and A10 for non-payers).

## Logistic regression results

Table 5 summarizes the logistic regression odds ratios, coefficients and t statistics showing the odds and marginal effects of independent research variables on the likelihood that a firm pays dividend. Firm-year observations with payout ratio greater than one, as well as those observations with negative earnings, are excluded from the sample. By including those observations coefficients would still have the same sign and would still be statistically significant.

Table 5 Logistic regression results on a sample of 35 listed firms (106 firm-year observations)

Variables	Odds ratios	Coefficients	t-statistic
ROE	2.45e+18***	42.342***	4.11
LSIZE	7.604***	2.028***	3.73
LEVERAGE	0.002*	-6.010*	-2.24
TOP5	5.14e-06***	-12.178***	-4.02
GOV	0.388	-0.945	-0.91
SGROWTH	0.060	-2.806	-1.01
_cons	1.04e-13 **	-29.894**	-3.21
N = 106		*p < 0.05, **p < 0.01, ***p < 0.001	
Log likelihood = -26.975047		Pseudo R2 = 0.6029	
LR chi2(6) = 81.90		Prob > chi2 = 0.0000	
Area under the ROC curve = 96,50%			

Note: ROE is defined as return of equity, LSIZE as logarithm of total assets, leverage as the ratio between total liabilities and total assets, TOP5 as holdings of 5 largest shareholders, SGROWTH as the percentage growth of sales. GOV is binary variable that equals 1 if government has more 51% of ownership rights and 0 otherwise.

Source: Authors' calculation.

Logistic regression results confirm differences in research variables among payers and non-payers. By looking in the table 5 it is easy to see that more profitable and larger firms are more likely to pay dividends, while more indebted firms and those with higher ownership concentration are less likely to pay dividends. Investment opportunities (growth of sales) as well as government ownership do not affect the likelihood of dividend distribution. Selected variables, except sales growth and ownership concentration, seem to be good classifiers that lead to more accurate discrimination of firms between payers and non-payers (area under the ROC curve = 96.50%). Presented goodness of fit measures (Pseudo R2 and LRchi2) also indicate that overall model is statistically significant. This is in line with the previous research about characteristics of dividend paying firms that have shown that both profitability and size in general, positively affect the dividend decision, while debt and ownership concentration have a negative impact on their dividend distribution.

## Linear regression results

Table 6 presents multiple linear regression results conducted on unbalanced panel data (among dividend payers). Pooled OLS model is used due to the small number of time units (some firms paid dividends just once in five-year period).

Model equation is:

$$DIVPR_{it} = \alpha + \beta_1 ROE_{it} + \beta_2 LSIZE_{it} + \beta_3 LEVERAGE_{it} + \beta_4 TOP5_{it} + \beta_5 GOV_{it} + \beta_6 SGROWTH_{it} + \varepsilon_{it}, \quad (1)$$

where  $i$  denotes each firm and  $t$  denotes time period. Model hypotheses are defined in table 2, while linear regression results are presented in table 6. Firm-year observations with payout ratio greater than one, as well as those observations with zero dividends or negative earnings are excluded from the sample.

Table 6 Linear regression results on a sample of 14 listed firms (36 firm-year observations)

Variables	Coefficients	t-statistic
DIV PR – dep. var.		
ROE	-0.183	-0.17
LSIZE	0.111**	2.99
LEVERAGE	-1.718**	-4.26
TOP5	0.273	0.84
GOV	-0.363*	-2.49
SGROWTH	-0.001	-0.00
_cons	-1.388	-2.11
N = 36, R <sup>2</sup> = 0.604		*p < 0.05, **p < 0.01, ***p < 0.001

Note: PR is the payout ratio defined as dividends to earnings ratio. ROE is defined as return of equity, LSIZE as logarithm of total assets, leverage as the ratio between total liabilities and total assets, TOP5 as holdings of 5 largest shareholders, SGROWTH as the percentage growth of sales. GOV is binary variable that equals 1 if government has more 51% of ownership rights and 0 otherwise.

Source: Authors' calculation.

As can be seen from the table 6, effects of profitability (ROE), ownership concentration (top 5 holdings percentage) and investment opportunities (sales growth) on dividend payout ratios are not statistically significant. On the other hand, firm size (logarithm of total assets) is associated with higher dividend payout ratios (at 5% significance level), while financial leverage is associated with lower levels of dividend distribution (at 1% significance level). Furthermore, even though logistic regression results show that being a government owned firm does not affect the likelihood to pay dividends, government firms tend to have lower payout ratios than non-government firms (significant at 1% significance level). However, both groups of firms do have very high payout ratios.

Regression diagnostics are given in table 7 in order to detect potential problems of the model and to check if a data set follows linear regression assumptions. The normality of the residuals is confirmed with Skewness-Kurtosis test, while the absence of multicollinearity is validated through the value of VIF and Tolerance indicator. The Breusch - Pagan / Cook - Wisberg test suggests the presence of heteroscedasticity in the model (residuals are not homogeneous). To deal with this problem heteroscedasticity, robust standard errors are used. Wooldridge test for autocorrelation in panel data confirmed the absence of autocorrelation, while the Linktest found no specification error.

Table 7 Linear regression diagnostics

Skewness-Kurtosis test	Skewness	Kurtosis	adj chi2	prob>chi2
	0.0631	0.4537	4.18	0.1237
Breusch-Pagan/Cook-Weisberg test for heteroskedasticity	chi2(1) = 5.78		Prob > chi2 = 0.0162	
Wooldridge test for autocorrelation in panel data	F (1,5) = 3.882		Prob > F = 0.1059	
Model specification test (Linktest)	_hatsq (t = 0.35)		p >  t  = 0.727	
Variable	VIF		1/VIF	
TOP5	3.85		0.259465	
ROE	3.20		0.312827	
SGROWTH	2.39		0.417735	
GOV	2.26		0.443367	
LSIZE	1.97		0.506422	
LEVERAGE	1.62		0.618540	
Mean VIF	2.55			

Source: Authors' calculation.

By looking at payout ratios statistics presented in this paper one could think that dividend-paying firms in Bosnia and Herzegovina are very generous to their shareholders. However, this is somewhat misleading. A closer look at their profitability (ROA and ROE) and its comparison with levels of profitability on developed and more mature capital markets alters this picture. As noted above, average ROE on mature capital market is about 16% and it is almost as twice as high as average ROE of public firms in Bosnia and Herzegovina. Moreover, correlation analysis between profitability (ROA, ROE) and dividend payout ratios yields negative correlation (-0.43) at 1% significance level. Negative correlation coefficient becomes even higher (-0.72) when applied to group of dividend payers owned by government. This means that public firms in Bosnia and Herzegovina, especially those under government control, pay less when ROEs are high and pay more when ROEs are low. Combined with the notion that majority of profitable firms do not use leverage despite historically low levels of interest rates, and that they actually lose value for their shareholders (Orsag, Džidić, 2018a, 2018b) one can conclude that public firms in Bosnia and Herzegovina are not so generous to their shareholders despite high payout figures. Having in mind weak investor protection along with the fact of "artificially" high payout ratios, especially among government owned firms, one could raise the doubt regarding incentives behind corporate actions in those firms suggesting that dividend policy may be part of broader politic goals rather than maximizing shareholder's wealth.

## Conclusion

The main goal of this paper was to analyze the determinants of dividend policy among public firms in Bosnia and Herzegovina. Research results suggest that dividend payers are more likely to be found among large and profitable firms, while firms that are more indebted and those with concentrated ownership are less likely to distribute earnings to their shareholders. Hypothesized link between investment opportunities and dividend payout ratios found no support in this study. However, selected indicators seem to provide good discrimination between dividend payers and non-payers. This is in line with previous research regarding internal factors of dividend policy captured on developed, mature capital markets. Furthermore, larger firms also tend to have higher payout ratios while heavy leveraged firms have lower payout ratios. Profitability, ownership concentration and investment opportunities do not affect the level of payout among dividend payers.

This research, as well as any other empirical research, has certain limitations. They are primarily concerned with number of firms that meet research sample criteria. Public firms in Bosnia and Herzegovina are limited to those firms that are publicly listed as consequence of law enforcement rather than real capital needs. Therefore, small number of publicly listed firms makes it impossible to test for industry effects. Furthermore, selected measure of sales growth may not be true proxy for investment opportunities. Overcoming these limitations by extending the sample size or using different research variables would certainly yield more valuable conclusions regarding the firm level factors of dividend policy in Bosnia and Herzegovina.

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## Appendix

Table A1 Descriptive statistics for payers in 2013

Variable	Obs	Mean	Std. Dev.	Min	Max
Payout ratio	7	.8411519	.0889959	.75	1
Return on equity	7	.0523787	.0527917	.0049	.1446
Return on assets	7	.0459929	.0457196	.0046	.1189
Total assets (in mln BAM)	7	642.48	429.40	43.69	1,260.83
Total liabilities / total assets	7	.1006866	.0623913	.019519	.1783805
Top 5 shareholders	7	.8557143	.1231337	.59	.97
Top 1 shareholder	7	.6071409	.1966984	.25	.9
Growth of sales	0				

Source: Authors' calculation.

Table A2 Descriptive statistics for payers in 2014

Variable	Obs	Mean	Std. Dev.	Min	Max
Payout ratio	10	.5763321	.3753954	.087500	.9990771
Return on equity	10	.0822462	.1039683	.001084	.3232413
Return on assets	10	.0533017	.0574481	.000954	.1463784
Total assets (in mln BAM)	10	652.88	1025.80	31.76	3,389.25
Total liabilities / total assets	10	.1349723	.1289357	0	.3446494
Top 5 shareholders	10	.77	.1945365	.48	.99
Top 1 shareholder	10	.496478	.2276067	.144794	.9
Growth of sales	10	.0215195	.1707348	-.255745	.2590757

Source: Authors' calculation.

Table A3 Descriptive statistics for payers in 2015

Variable	Obs	Mean	Std. Dev.	Min	Max
Payout ratio	11	.6368397	.3774359	.0379523	1
Return on equity	11	.0927612	.1624217	.0012181	.5665799
Return on assets	11	.0681063	.1060608	.0010728	.37
Total assets (in mln BAM)	11	683.70	985.88	43.77	3,389
Total liabilities / total assets	11	.1382795	.1117028	.018562	.3549896
Top 5 shareholders	11	.7872727	.1910021	.49	.99
Top 1 shareholder	11	.5713433	.2748049	.1447939	.93
Growth of sales	11	.012811	.2337764	-.2962804	.5954944

Source: Authors' calculation.

Table A4 Descriptive statistics for payers in 2016

Variable	Obs	Mean	Std. Dev.	Min	Max
Payout ratio	9	.5096881	.3729868	.068603	1
Return on equity	9	.1024801	.0794977	.0042942	.2426131
Return on assets	9	.0824172	.061869	.0037746	.1940928
Total assets (in mln BAM)	9	681.76	1100.16	44.18	3,406.49
Total liabilities / total assets	9	.1584829	.1087022	.0570204	.3586212
Top 5 shareholders	9	.813284	.1811102	.53	.99
Top 1 shareholder	9	.566093	.2993725	.1447939	.93
Growth of sales	9	.0563703	.1082777	-.1000281	.2454158

Source: Authors' calculation.

Table A5 Descriptive statistics for payers in 2017

Variable	Obs	Mean	Std. Dev.	Min	Max
Payout ratio	6	.3571273	.37516	.045179	1
Return on equity	6	.1301256	.0786033	.0406	.2343229
Return on assets	6	.1161579	.0702832	.0394862	.2188593
Total assets (in mln BAM)	6	274.28	294.49	59.58	843.63
Total liabilities / total assets	6	.1706604	.1109283	.0498155	.3572637
Top 5 shareholders	6	.8066667	.1618229	.58	.99
Top 1 shareholder	6	.4791323	.2380162	.1447939	.79
Growth of sales	6	.0513862	.1735274	-.1932541	.3173661

Source: Authors' calculation.

Table A6 Descriptive statistics for non-payers in 2013

Variable	Obs	Mean	Std. Dev.	Min	Max
Payout ratio	19	-	-	-	-
Return on equity	19	.0543376	.0948705	.0001756	.3817347
Return on assets	19	.0334831	.046435	.0001615	.1423659
Total assets (in mln BAM)	19	329.29	793.78	19.21	3,398.59
Total liabilities / total assets	19	.2069834	.1671002	.0014482	.5586481
Top 5 shareholders	19	.8284211	.1790488	.38	.99
Top 1 shareholder	19	.5886734	.2246695	.1447939	.9
Growth of sales	0				

Source: Authors' calculation.

Table A7 Descriptive statistics for non-payers in 2014

Variable	Obs	Mean	Std. Dev.	Min	Max
Payout ratio	18	-	-	-	-
Return on equity	18	.0357891	.0408937	.0003382	.1316541
Return on assets	18	.0200496	.0236526	.0003366	.0911765
Total assets (in mln BAM)	18	189.35	291.43	9.75	1,246.52
Total liabilities / total assets	18	.3057082	.2433646	.0029669	.7840476
Top 5 shareholders	18	.8822222	.1319784	.39	.99
Top 1 shareholder	18	.6211111	.1723502	.21	.9
Growth of sales	18	.0264731	.2276815	-.3908828	.676761

Source: Authors' calculation.

Table A8 Descriptive statistics for non-payers in 2015

Variable	Obs	Mean	Std. Dev.	Min	Max
Payout ratio	12	-	-	-	-
Return on equity	12	.0469789	.0717061	.0004465	.2409997
Return on assets	12	.0808191	.1715352	.0003838	.5898746
Total assets (in mln BAM)	12	103.57	115.16	3.54	397.51
Total liabilities / total assets	12	.2614582	.2035767	.0024674	.5907189
Top 5 shareholders	12	.875	.1471239	.43	.99
Top 1 shareholder	12	.6316667	.2091034	.24	.94
Growth of sales	12	.0685243	.1560745	-.2067552	.367915

Source: Authors' calculation.

Table A9 Descriptive statistics for non-payers in 2016

Variable	Obs	Mean	Std. Dev.	Min	Max
Payout ratio	20	-	-	-	-
Return on equity	20	.0249129	.0379267	.0009593	.138588
Return on assets	20	.0144274	.0210127	.0006874	.0788143
Total assets (in mln BAM)	20	251.22	319.74	8.10	1,157.72
Total liabilities / total assets	20	.2689049	.233431	.0017046	.6301174
Top 5 shareholders	20	.8858142	.1239474	.41	.99
Top 1 shareholder	20	.6603385	.1909882	.24	.95
Growth of sales	20	.142557	.35105	-.4371739	.9722494

Source: Authors' calculation.

Table A10 Descriptive statistics for non-payers in 2017

Variable	Obs	Mean	Std. Dev.	Min	Max
Payout ratio	20	-	-	-	-
Return on equity	20	.0466859	.0532237	.000278	.1871989
Return on assets	20	.0259519	.0303305	.0001906	.135057
Total assets (in mln BAM)	20	155.31	269.91	8.08	1,245.50
Total liabilities / total assets	20	.2803637	.2402301	.0019361	.7924764
Top 5 shareholders	20	.8975	.1186714	.45	.99
Top 1 shareholder	20	.6393524	.2088689	.1	.94
Growth of sales	20	.0857746	.3158722	-.4089707	.8470001

Source: Authors' calculation.