

FIRM SIZE AND DIVIDEND POLICY OF EUROPEAN FIRMS: EVIDENCE FROM FINANCIAL CRISES*

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Abstract

This article investigates the impact of firm size and financial crises on cash dividends between 2001 and 2017 by employing 52,989 firm-year observations that represent 5,377 sample firms in eighteen European countries. By using the Tobit model, the findings show that smaller firms that have higher information asymmetry pay lower dividends than larger firms. Besides, small firms have a significantly negative impact on dividend payments when the agency costs are high, and investment opportunities are low. The picture differs when uncertainty arises. Specifically, smaller firms disgorge lower cash to their shareholders in the global financial crisis 2007-2009 (GFC) period. However, the impact of firm size on dividend policy does not differ by the European debt crisis 2010-2012 (EDC). In sum, investors should consider uncertainties and firm size to make more informed and prudent dividend decisions regarding which firms to invest.

Keywords: *dividend, European debt crisis, firm size, global financial crisis.*

FİRMA BÜYÜKLÜĞÜ VE AVRUPALI FİRMALARIN TEMETTÜ POLİTİKALARI: FİNANSAL KRİZLERDEN ÖRNEKLER

Öz

Bu makale, firma büyüklüğünün ve finansal krizlerin 2001 ve 2017 arasındaki nakit temettüleri üzerindeki etkisini on sekiz Avrupa ülkesinde 5,377 örnek firmayı temsil eden 52,989 firma yılı gözlemi kullanarak, araştırmaktadır. Tobit modelini kullanarak, daha yüksek bilgi asimetrisine sahip daha küçük firmaların daha büyük firmalardan daha düşük temettüler ödediğini bulgular göstermektedir. Ayrıca, ajans maliyetleri yüksek ve yatırım fırsatları düşük olduğunda, küçük firmaların temettü ödemeleri üzerinde önemli

* An earlier version of this article has been presented at the Marmara Conference on European Studies 2020 (MCES-2020), İstanbul, 7-8 February, 2020.

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ölçüde olumsuz etkisi vardır. Belirsizlik ortaya çıktığında resim farklılaşır. Özellikle, daha küçük firmalar küresel mali kriz 2007-2009 döneminde (GFC) hissedarlarına daha düşük temettüler ödemektedir. Ancak, firma büyüklüğünün temettü politikası üzerindeki etkisi 2010-2012 Avrupa borç krizi (EDC) ile farklılık göstermemektedir. Özetle, yatırımcılar hangi firmalara yatırım yapacakları konusunda daha bilinçli ve ihtiyatlı temettü kararları vermek için belirsizlikleri ve firma büyüklüğünü göz önünde bulundurmalıdır.

Anahtar Kelimeler: temettü, Avrupa borç krizi, firma büyüklüğü, küresel finansal kriz.

Introduction

As a response of Miller and Modigliani's (1961) irrelevance theorem, dividend policy has been investigated employing information asymmetry by the empirical literature (e.g. La Porta et al., 2000; Sawicki, 2009; Cimini, 2015; Tran et al., 2017; Pahi and Yadav, 2019). Also, the literature tries to solve the dividend puzzle of Black (1976). However, since dividend payout decisions depend on (i) firm-level differences, as corporate governance (e.g. Sawicki, 2009; Pahi and Yadav, 2019) or ownership structure (e.g. Attig et al., 2016) and (ii) country-level diversification, as minority investor protection (e.g. La Porta et al., 2000) as well as uncertainties, this paper examines the dividend policy and its relationship with recent financial crises for European firms across the firm-level by considering the firm size.

Previous research reveals an utter fall in dividend payments in time of uncertainty. For example, Bliss et al. (2015), Floyd et al. (2015) and Hilliard et al. (2018) show that US firms drop dividend payouts during the global financial crisis (GFC). Al-Malkawi et al. (2014) also mention a decrease in dividends for Omani firms in the GFC period. Specifically, Cimini (2015) examines the earning management of firms in 15 European countries over the period 2006-2012. However, to date, the role of firm size on the dividend policy for 18 European countries between 2001 and 2017 has not been investigated by the literature in the financial crisis context. Therefore, since the global financial crisis (2007-09) and Eurozone debt crisis (2010-12) give a natural experiment opportunity, this paper investigates the dividend policy of the firm size in Europe during financial crises using the multi-country data.

Using 52,989 firm-years from eighteen European countries and Tobit panel models, the empirical results show that smaller firms have higher dividend payments from 2001 to 2017. Besides, this inverse association between small firms and dividends becomes more significant during the GFC when the information asymmetry increases. On the other hand, the picture does not differ in the time of the EDC. The present study contributes further evidence by

pointing out the impact of the firm size and financial crises on the dividend policy of European firms.

The remainder of the study is as follows. Hypotheses are developed, after reviewing of theoretical background. Next, the empirical strategy and the sample present the empirical models and data, respectively. Then, empirical results are discussed showing univariate, multivariate and robustness analyses in that order. Last, conclusions are summarized.

Theoretical Background

Signaling Theory

Signaling theory suggests investors have limited information on small firms' value, earnings quality, and potential prospects because of higher information asymmetry. Consequently, firms lessen the undervaluation problem by employing dividends as the signaling device to show their accurate value to outside investors. In this case, Lintner (1956) claims that the decrease or cut on dividend payouts may be taken an inverse signal by the investors. On the other hand, managers do not intend to increase dividend payments due to lower earnings, which is not convenient with higher dividend payouts (Abreu and Gulamhussen, 2013). As one of the implications of signaling theory, dividends are supposed to be smooth when managers are related to unstable dividend payouts. Therefore, to understand whether dividends are used or not as a signaling device over time is crucial for the signaling theory. This article aims recent recessions to realize whether smaller firms in Europe perform adversely concerning dividend payouts.

Agency Theory

Jensen (1986) presumes dividend helps to shareholders to generate a control and discipline tool on managers as a substitute of directly intervening with the firm's supervision. Dividends offer information on lowering the potential agency cost and investments in projects with a present negative value. Dividends also contain information about the future of the firm in aligning interests of shareholders and managers and investing in positive net present value projects by managers.

Hypothesis Development

Mature or larger firms face less information asymmetry problem; so, they intend to pay higher dividends. More recently, Tran (2019) finds that larger firms disgorge higher cash by international evidence. Furthermore, Pahi and Yadav (2019) show firms with higher market capitalization pay out higher dividends for Indian firms. Since this study divides the sample as small and

large firms, it is expected that small firms pay lower dividends than large firms. The first hypothesis as follows:

Hypothesis 1: Small firms pay lower dividends than large firms.

With the start of the GFC, small firms have difficulties in accessing external finance and disgoring cash because of higher information asymmetry (Abreu and Gulamhussen, 2013). As a result of this case, both small and large firms drop disgoring cash, but small firms decrease their dividend payments higher than large firms during the GFC than in the financially stable period. The second hypothesis stated:

Hypothesis 2: Small firms decrease dividends higher than large firms during the GFC than normal times.

While the financial crisis continues specifically in some European countries, e.g. Greece, after the GFC, small firms in other European countries may cover their financial structure and should signal to outsiders by showing their true value. In this case, small firms may decrease their dividend payments lower than large firms during the EDC by using dividends as the signaling device. The third hypothesis is as follows:

Hypothesis 3: Small firms decrease dividends lower than large firms during the EDC than normal times.

Empirical Strategy

Dividends may show the censored and continuous specification; that is why the Tobit model is suitable to test the empirical hypotheses. Considering the main explanatory variables, the SMALL dummy is generated to capture the effect of small firms on dividends. Specifically, the whole sample is divided across firm size and the number of employees year by year.

First, the role of small European firms on cash dividends is investigated by the following model:

$$\begin{aligned} \text{Tobit (DIV)}_{ij,t} = & \alpha + \beta_1 \text{SMALL}_{i,t} \\ & + \beta_2 \text{PROF}_{i,t-1} + \beta_3 \text{LEV}_{i,t-1} + \beta_4 \text{CASH}_{i,t-1} + \Sigma \text{INDUSTRY} + \Sigma \text{YEAR} \\ & + v_{ij} + \varepsilon_{ij,t}, \end{aligned} \quad (1)$$

Next, the impact of the interaction of small European firms and the global financial crisis (GFC) on cash dividends is analyzed as stated:

$$\begin{aligned} \text{Tobit (DIV)}_{ij,t} = & \alpha + \beta_1 \text{SMALL}_{i,t} + \beta_2 \text{GFCt} \times \text{SMALL}_{i,t} + \beta_3 \text{GFCt} \\ & + \beta_4 \text{PROF}_{i,t-1} + \beta_5 \text{LEV}_{i,t-1} + \beta_6 \text{CASH}_{i,t-1} + \Sigma \text{INDUSTRY} \\ & + v_{ij} + \varepsilon_{ij,t}, \end{aligned} \quad (2)$$

Last, the effect of the interaction of small European firms and the European debt crisis (EDC) on dividends is examined as follows:

$$\begin{aligned} \text{Tobit (DIV)}_{ij,t} = & \alpha + \beta_1 \text{SMALL}_{i,t} + \beta_2 \text{EDC}_t \times \text{SMALL}_{i,t} + \beta_3 \text{EDC}_t \\ & + \beta_4 \text{PROF}_{i,t-1} + \beta_5 \text{LEV}_{i,t-1} + \beta_6 \text{CASH}_{i,t-1} + \Sigma \text{INDUSTRY} \\ & + v_{ij} + \varepsilon_{ij,t}, \end{aligned} \quad (3)$$

Regarding the panel estimator, fixed effects do not give reliable results on Tobit estimations (Honore, 1992). Random effects (RE) have the likelihood specification and may cluster the standard errors at firm-level; that is why RE panel Tobit is convenient to test these models.

The Sample

The sample of 5,377 non-financial firms is derived from *Worldscope* to produce an unbalanced longitudinal dataset. The data includes eighteen European countries that are Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland, Turkey, and the UK. The steps are as follows by constructing the sample: first, non-financial firms are selected by excluding financial and utility firms because of different accounting structures (e.g. Tekin and Polat, 2020). Next, firms have been selected from 2001 to 2017 by including recent financial crises, which are the global financial crisis 2007-09 (GFC) and the Eurozone debt crisis 2010-12 (EDC). The sample composition is also presented in Table A1 by country, industry, and year in Appendix.

Table 1: Variable Definitions

Variables	Symbols	Definitions
<i>Dependent</i>		
Dividends	DIV	Cash dividends paid / Total assets
<i>Explanatory</i>		
Ln(Total Assets)	SMALL1	Dummy variable is 1 for the bottom of three deciles of the logarithm of total assets, 0 for the top of three deciles
Number of employees	SMALL2	Dummy variable is 1 for the bottom of three deciles of the number of employees, 0 for the top of three deciles
Global financial crisis	GFC	Dummy variable is 1 for the years of 2007-09, otherwise 0
Eurozone debt crisis	EDC	Dummy variable is 1 for the years of 2010-12, otherwise 0
<i>Control</i>		
Profitability	PROF	Earnings before interest and tax / Total assets
Leverage	LEV	Total debt / Total assets
Cash holdings	CASH	Cash and short-term investments/ Total assets

Source: *Worldscope*

Table 2: Descriptive Statistics

Panel A. Ln(Total Assets)								
	Small firms				Large firms			
	DIV	L.PROF	L.LEV	L.CASH	DIV	L.PROF	L.LEV	L.CASH
Mean	0.014	-0.027	0.175	0.215	0.022	0.102	0.260	0.113
SD	0.049	0.266	0.213	0.233	0.038	0.097	0.178	0.110
Min	0.000	-0.971	0.000	0.000	0.000	-0.971	0.000	0.000
Median	0.000	0.042	0.098	0.128	0.012	0.099	0.246	0.081
Max	0.625	0.816	0.983	0.965	0.625	0.815	0.983	0.965

Panel B. Number of employees								
	Small firms				Large firms			
	DIV	L.PROF	L.LEV	L.CASH	DIV	L.PROF	L.LEV	L.CASH
Mean	0.014	-0.034	0.166	0.228	0.023	0.105	0.253	0.111
SD	0.047	0.270	0.211	0.238	0.038	0.095	0.171	0.099
Min	0.000	-0.971	0.000	0.000	0.000	-0.971	0.000	0.000
Median	0.000	0.039	0.083	0.142	0.013	0.100	0.242	0.082
Max	0.625	0.816	0.983	0.965	0.625	0.816	0.983	0.965

Notes: Table 2 presents the descriptive statistics for small and large firms that is divided according to firm size in Panel A and the number of employees in Panel B.

Table 3: Correlation Matrix

Panel A. Ln(Total Assets)								
	Small firms				Large firms			
	DIV	L.PROF	L.LEV	VIF	DIV	L.PROF	L.LEV	VIF
L.PROF	0.275			1.07	0.394			1.03
L.LEV	-0.119	-0.053		1.13	-0.199	-0.170		1.10
L.CASH	0.079	-0.227	-0.319	1.19	0.135	0.086	-0.302	1.13

Panel B. Number of employees								
	Small firms				Large firms			
	DIV	L.PROF	L.LEV	VIF	DIV	L.PROF	L.LEV	VIF
L.PROF	0.280			1.08	0.428			1.04
L.LEV	-0.114	-0.045		1.13	-0.207	-0.181		1.11
L.CASH	0.064	-0.236	-0.318	1.20	0.158	0.136	-0.303	1.13

Notes: Table 3 presents the correlation matrices for small and large firms that is divided according to firm size in Panel A and the number of employees in Panel B. The variance inflation factor (VIF) values show whether the sub datasets suffer from multicollinearity. Since VIF values are smaller than 10, any dataset does not face any multicollinearity problem (Freund et al., 2006).

Regarding the dependent variable, cash dividends to total assets are employed. Since the aim of this research shows the impact of firm size on dividends, the sample is divided by small and large firms according to the firm size and the number of employees to generate a dummy variable. As

explanatory variables, profitability, leverage, and cash holdings are included to control their impact on dividends. All variables are winsorized at 1% and 99% to mitigate outliers (e.g. Tekin, 2020). Definitions of variables are presented in Table 1.

Besides, Table 2 and Table 3 show descriptive statistics and correlation matrix for small and large firms across firm size in Panel A and the number of employees in Panel B, respectively. Table 2 confirms that small firms have lower dividends, profitability, and leverage as well as higher cash holdings. Table 3 proves that sub-datasets do not suffer any multicollinearity problem because the VIF values smaller 10 (Freund et al., 2006).

Empirical Results

Univariate Analyses

Table 4 presents how dividends and its' determinants change across smaller and larger firms. Firms are divided into small and large firms according to the firm size, whether they are below and above median year by year, respectively. All differences between small and larger firms are significant. Specifically, small firms have lower dividends, profitability, and leverage as well as higher cash holdings.

Table 4: Mean Comparison of Dividends and its Determinants: Large vs. Small firms

	Large firms (1)	Small firms (2)	Difference (3) = (1)-(2)	t-test
DIV	0.022	0.014	0.008***	20.16
L.PROF	0.102	-0.027	0.129***	73.17
L.LEV	0.260	0.175	0.085***	50.66
L.CASH	0.113	0.215	-0.102***	-63.99

Notes: Table 4 reports the mean of dividend and its determinants for large and small firms across firm size. In column 3, the mean differences of variables between large and small firms by presenting t-test in following columns. All variables are described in Table 1. *** implies statistical significance at 1%.

Table 5: The Impact of Small Firms and Financial Crises on Dividends

	Panel A. <i>Hypothesis 1</i>	Panel B. <i>Hypothesis 2</i> Interaction by GFC	Panel C. <i>Hypothesis 3</i> Interaction by EDC
Variables	(1)	(2)	(3)
SMALL	-0.002** (0.001)	-0.001* (0.001)	-0.002*** (0.001)
GFC x SMALL		-0.003*** (0.001)	
EDC x SMALL			-0.000 (0.001)
GFC		0.002*** (0.001)	
EDC			-0.001** (0.001)
<i>Controls</i>			
L.PROF	0.038*** (0.001)	0.038*** (0.001)	0.038*** (0.001)
L.LEV	-0.022*** (0.001)	-0.023*** (0.001)	-0.023*** (0.001)
L.CASH	0.023*** (0.001)	0.022*** (0.001)	0.022*** (0.001)
Constant	0.007*** (0.002)	0.011*** (0.002)	0.012*** (0.002)
rho	0.347	0.345	0.345
LR test	11,000***	11,000***	11,000***
Industry FE	✓	✓	✓
Year FE	✓	×	×
Firms	5,377	5,377	5,377
N	52,989	52,989	52,989

Notes: Table 5 shows the role of the global financial crisis (GFC) and the Eurozone debt crisis (EDC) and their interactions with SMALL dummy, which is calculated with $\ln(\text{Total Assets})$, on cash dividends. All variables are defined in Table 1. *** and ** imply statistical significance at 1% and 5%, respectively.

Multivariate Analyses

The impact of the SMALL dummy and its interactions with the GFC and the EDC by controlling firm-level factors is investigated by employing the Tobit panel estimations. If the rho is not equal to zero, the RE panel Tobit is preferable to the pooled ordinary least square (OLS). Specifically, the rho values are different from zero in all three models in Table 5; that is why all hypotheses are tested by the RE panel Tobit.

First, in Panel A, the role of small firms on dividends is examined for the period 2001-2017 in Europe. In column 1, SMALL is negatively related to dividends. In other words, small firms pay lower dividends than large firms in Europe which is line with previous research (Von Eije and Megginson, 2008; De Cesari and Ozkan, 2015).

Next, SMALL loses its significance in Panel B. However, the interaction term of GFC x SMALL shows that small firms decrease their dividend level by 0.003 in the GFC period. Therefore, small firms decrease dividends higher than large firms during the GFC than normal times, as supported by the signaling theory.

Last, in Panel C, the significance level of SMALL increases. During the EDC, European firms decrease their dividend payments contrary to the GFC. Contrary to the GFC period, the dividend policy of European firms does not differ during the EDC period. It seems that European firms have more difficult financial conditions during the GFC than the EDC. Namely, the signaling theory has more explanatory power due to raises information asymmetry in the GFC, but it does not in the EDC period.

Robustness Analyses

By following the same methodology, small (large) firms are determined as below (above) the median of the number of employees year by year. Both univariate and multivariate analyses are retested by the alternative measure of SMALL dummy across the number of employees.

Table 6: Retest of Univariate Analyses by the Alternative Measure of Firm Size

	Large firms (1)	Small firms (2)	Difference (3) = (1)-(2)	t-test
DIV	0.023	0.014	0.009***	21.40
L.PROF	0.105	-0.034	0.139***	73.06
L.LEV	0.253	0.166	0.087***	48.24
L.CASH	0.111	0.228	-0.117***	-68.92

Notes: Table 6 retests the mean of dividend and its determinants for large and small firms across the number of employees. In column 3, the mean differences of variables between large and small firms by presenting t-test in following columns. All variables are described in Table 1. *** implies statistical significance at 1%.

Table 7: Retest of Multivariate Analyses by the Alternative Measure of Firm Size

	Panel A. <i>Hypothesis 1</i> (1)	Panel B. <i>Hypothesis 2</i> Interaction by GFC (2)	Panel C. <i>Hypothesis 3</i> Interaction by EDC (3)
SMALL	-0.003*** (0.001)	-0.003*** (0.001)	-0.003*** (0.001)
GFC x SMALL		-0.004*** (0.001)	
EDC x SMALL			-0.000 (0.001)
GFC		0.002*** (0.001)	
EDC			-0.001**

	(0.000)		
<i>Controls</i>			
L.PROF	0.036*** (0.001)	0.037*** (0.001)	0.037*** (0.001)
L.LEV	-0.025*** (0.001)	-0.025*** (0.001)	-0.025*** (0.001)
L.CASH	0.021*** (0.001)	0.020*** (0.001)	0.020*** (0.001)
Constant	0.008*** (0.002)	0.013*** (0.002)	0.013*** (0.002)
rho	0.402	0.401	0.401
LR test	10,000***	10,000***	10,000***
Industry FE	✓	✓	✓
Year FE	✓	×	×
Firms	4,849	4,849	4,849
N	43,089	43,089	43,089

Notes: Table 7 shows the role of the global financial crisis (GFC) and the Eurozone debt crisis (EDC) and their interactions with SMALL dummy, which is calculated with the number of employees, on cash dividends. All variables are defined in Table 1. *** and ** imply statistical significance at 1% and 5%, respectively.

Conclusion

This article investigates the impact of recent financial crises and firm size on dividends of 5,377 firms in eighteen European countries for the period 2001-2017. Employing the random effect panel Tobit model, the findings show that smaller firms pay lower dividends than larger firms for the entire period, as confirmed by the signaling theory. Smaller firms decrease their dividend payments more during the GFC, which makes the signaling theory powerful. However, the picture change does not differ during the time of EDC than the normal times.

This study contributes further evidence that the explanatory power of signaling theory on dividend policy differs by varying firm size and existing of financial crises. Small firms decrease their dividend payments higher than large firms during the GFC. Taken together all results, the signaling theory drives the dividend policy of small firms in the GFC period by employing dividends as a signal for the market in Europe. Consequently, investors should be concerned about the firm size and the market imperfections to invest.

Appendix

Table 1A: Sample Composition by Country, Industry and Year

Country	# of N	Country	# of N	Country	# of N
Austria	547	Greece	1,930	Portugal	512
Belgium	888	Ireland	506	Spain	1,351
Denmark	1,418	Italy	2,212	Sweden	4,655
Finland	1,468	Netherlands	1,217	Switzerland	1,974
France	6,200	Norway	2,033	Turkey	2,782
Germany	6,001	Poland	3,468	UK	13,827
Industry	# of N	Industry	# of N		
Basic Materials	4,871	Industrials	15,698		
Consumer Goods	8,238	Oil & Gas	3,150		
Consumer Service	8,270	Technology	7,114		
Health Care	4,811	Telecommunication	837		
Year	# of N	Year	# of N	Year	# of N
2001	2,034	2007	3,025	2013	3,968
2002	2,119	2008	3,179	2014	3,987
2003	2,274	2009	3,335	2015	3,880
2004	2,418	2010	3,517	2016	3,706
2005	2,654	2011	3,636	2017	2,566
2006	2,872	2012	3,819		

Source: Worldscope

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