

Financial and Non-financial Factors on Dividend Policy of Non-financial Enterprises Listed on Hochiminh City Stock Exchange (HOSE) and Hanoi Stock Exchange (HNX) from 2008 to 2018

Tran Hoang Vu¹, Nguyen Nam Trung² and Le Duy Khang³

¹Faculty of Finance and Banking, University of Finance and Accountancy

²Faculty of Economics People's Police University

³Faculty of Business Administration, Ho Chi Minh Open University

Received: 25 February 2021; Revised: 10 March 2021;

Accepted 16 March 2021; Publication: 5 June 2021

Abstract: This research examines the factors affecting the dividend payout ratio of non-financial companies listed on HOSE & HNX in Vietnam from 2008-2018. The results demonstrate the positive relationship between Past_Divid end and CEO gender on dividend payments. However, firm size and ROE have negative impact on the Payout ratio.

Keywords: Dividend policy, foreign ownership, female CEO, size, ROE.

JEL: G32, G34, G35

1. Introduction

Dividend policy is among vital financial decisions that help maximize shareholder value. There are various studies on dividend policy in the world, but it is still a controversial matter. For example, the study of dividend policy has attracted the attention of scholars since the 1950s of the last century (Gordon, 1959; Lintner, 1956, 1962; Miller and Modigliani, 1961). Hafeez and Attiya, (2009), Black and Scholes (1974), Frankfurter and Wood (2002) suggest that dividend policy remains among the most discussed problem in both developed and emerging economies. Although the first study of this topic was conducted by Lintner (1956), and despite the studies over the past few decades to reveal the secret of dividend policy, they cannot provide an acceptable explanation for the observed dividend behaviour. This fact paved the way for the introduction of the concept of the dividend puzzle (Black, 1976). Feldstein and Green (1983, page 17) support the conclusions of Black (1976) and note that: The nearly universal policy of paying significant dividends is the central puzzle. Baker, Powell, and Veit (2000, p. 255) provide additional support for this view: "Despite this voluminous amount of research, we still do not have all the answers to the dividend puzzle." Jabbouri (2015) suggests that dividend policy positively relates to size, and liquidity, while it negatively relates to leverage, growth, free cash flow. A negative relationship with free cash flow may be a sign of potential agency problems. This relationship, even

more, pronounces in markets with information asymmetry and weak protection of investors. Besides, He and Li (2009) examined listed firms on the Chinese stock market from 2003 to 2007, and they indicate that profits, financial leverage, and cash holding affect the dividend payment of listed companies.

The Vietnamese stock market was born and officially operated since May 2000. However, the research on equity of joint-stock companies listed on the stock market is not much. Dao Le Minh authored the earliest study on dividend policy in Vietnam in 2004 on the current status of the dividend policy of JSCs in Vietnam from 2000 to 2004. However, research in the period when the Vietnam market was officially put into operation, so there are not many practical bases to analyze the policies of enterprises. By examining the dividend payout policy of the 30 earliest listed companies on Vietnam's stock market, the research topic is a way to successfully and adequately apply the hypothesis of dividend policy, helping For JSCs to have a basic understanding of dividend policy and reasonable application conditions to ensure the harmony of interests of shareholders and the development of businesses in the future.

Also, there are studies by Dinh Bao Ngoc and Nguyen Chi Cuong (2014) who conducted surveys on 95 companies listed on the Vietnamese Stock Market in 2008-2013 and came to a conclusion: Enterprises in Vietnam have low dividend payout ratios and the difference between firms is not too large. Regarding the regression model, the identified factors affecting dividend policy such as earnings per share (EPS), profitability (ROA), and corporate dividend policy in the past as well as economic growth, bank interest rates to dividend rates. These factors are proportional to the dividend policy, while economic growth is inversely proportional. Vo Xuan Vinh (2014) studied the impact of dividend policy on stock price movements. The paper uses the method of analyzing the regression panel data model with data from 103 enterprises listed in the Hochiminh Stock Exchange from 2008 to 2012. The results show that the dividend payout ratio has the same effect as the stock price movement, and the stock dividend has the opposite effect with the stock price fluctuation. Also, other factors positively impact stock price movements such as long-term debt ratio, asset growth, and variable firm size and profitability that have opposite effects on stock price movements.

In general, most of the domestic research works have been mainly researched on the status of dividend payment of JSCs listed on the Vietnam Stock Market and offering solutions to complete dividend policy for businesses, not considered all the impact of the factors on dividend policy, and the research results only solved the managers' questions.

2. Literature Review

2.1. Factors affecting dividend policy from previous studies

Size : Collins *et al.* (1996) and Mitton (2004) point out that there is a positive relationship between firm size and dividend payment. Li & Lie (2006)

concluded that larger firms are more likely to increase dividends. Mehta (2012) examines the UAE market, and the result showed that size is an essential factor in the decision of the dividend policy. According to Signalling Hypothesis, large-scale businesses always want to polish their image and name, so they will continuously give positive signals about their business operations. One of the ways businesses choose is to pay a high dividend.

Compared to small businesses, large firms have easier access to external capital markets and have an advantage in borrowing because of more significant information transparency and greater peace of mind to the creditors. Collins *et al.* (1966), Lloyd *et al.* (1985), Mitton (2004), Li & Lie (2006), Mehta (2012) indicate that large firms tend to diversify their investments, and their net cash flows are more stable than small firms. Therefore, large businesses are willing to pay higher dividends.

Past Dividend: Lintner (1956), Musa (2009), Brittain (1966) suggest that the previous dividend payout ratio played a significant role in the dividend payments of the current year. According to the Signaling Hypothesis, businesses tend to maintain a smooth dividend payout ratio to prevent adverse reactions from the market. Thus, Baker *et al.* (2002) emphasize that managers do not increase dividend payments unless they believe they can maintain such momentum in the coming years. Managers decide to increase dividend payments when they want to signal to the market that they are confident in the development of the business in the future. On the other hand, cutting dividends is considered as a sign of potential business stagnant. However, in some cases, the dividend cut reflects the need to hold cash for future investment activities of the business.

Growth Opportunity: Although various studies discover that revenue growth affects dividend policy, there are mixed findings on the impacts of revenue growth rates on dividend payments. The first group of researchers argues that firms with high growth rates are less likely to pay dividends because of the higher demand for capital. Diamond (1967) finds out that when the industry has a low growth rate, investors prefer firms to pay higher dividends. Fama and French (2001), Shao (2013), Jensen *et al.* (1995), Alli *et al.* (1993), Rozeff (1982) also indicate an inverse relationship between growth and dividend payouts. They suggest that growing firms are likely to retain most of their profits to expand their businesses.

On the other hand, Ebenezer *et al.* (2013) examine the dividend policy of manufacturing enterprises in Ghana, and their results show that revenue growth had a significant positive impact on dividend payments. According to the Signaling Hypothesis, fast-growing firms broadcast a good signal by increasing the dividend payouts to attract external capital. This capital can support the incoming business projects of the enterprise. Besides, this helps to increase the reputation and image of businesses on the stock market, creating favorable conditions for raising additional capital from other channels. Lintner (1956) and Brittain (1964) indicate that increasing ROA and ROE have a positive

influence on the dividends in the U.S. from 1919 to 1960. Similarly, Fama & French (2000); Jensen *et al.* (1992), Aivazian *et al.* (2003), Amidu and Abor (2006), Naeem & Nasr (2007) Bose & Husain (2011) have found similar results.

Financial Leverage: Rozeff (1982), Crutchey and Hansen (1989), Jensen *et al.* (1992), Agrawal and Jayraman (1994), Avivazian *et al.* (2003) suggest that highly levered firms tend to decrease dividends in order to pay interests. These firms are likely to retain profits to finance the business activities, repay the debt to creditors rather than paying dividends. However, Brockman and Unlu (2009) suggest the positive relationship between leverage dividends. Their findings rely on signaling theory, which indicates that higher levered firms tend to pay higher dividends to signal optimistic business performance. Therefore, they may stabilize the psychology of investors and strengthen trust for creditors.

Weak solvency also often comes with low dividend payout ratios due to a shortage of working assets. The higher the dividend payout ratio, the lower the number of current assets. Baker *et al.* (2001) conclude that there is an inverse relationship between solvency and dividend rate.

Foreign ownership: Kevin *et al.* (2012) examine dividend policy in enterprises with different ownership characteristics in China. The author finds evidence that the shareholding ratio of foreign shareholders has a negative relationship with the dividend payment. Foreign investors have better experience in supervising agency costs than individual shareholders. Meanwhile, Baba (2009) and Wei (2004) argue that the higher the foreign ownership, the higher the dividend payment rate is also in businesses. The explanation for this argument is that foreign investors prefer firms to pay dividends when their control capacity is not strong enough to prevent management's self-interest, or it is too expensive for them, they will require a higher cash dividend payout ratio to reduce free cash flow within the business.

Gender of CEO: Many studies suggest that female CEOs tend to pay higher dividend payments. Khan and Vieito (2013) investigated U.S. businesses in 1992-2004 and found that female CEOs increased the profitability of businesses and thereby led to higher dividend payments. Smith *et al.* (2006) suggest an explanation that female executives have a variety of experiences from both work and social life. Besides, Singh and Vinnicombe (2004) argue that female CEOs know more about the business segment than men, thus increasing the quality and spurt of decision making. Burke and McKeen (1996) also discover that senior female executives can positively influence the career development of young female colleagues. Therefore, business performance and the dividend will increase directly and indirectly.

3. Data and Methodology

3.1. Research data

We collect data of listed companies on the Ho Chi Minh Stock Exchange (HOSE) and the Hanoi Stock Exchange (HNX) in the 2008-2018 period. We collect from

financial statements, annual reports, prospectus, Board of Directors' resolutions. We also collect the dividend data from the website of Vietstock Securities Joint Stock Company. We follow Fama and French (1992) to exclude financial firms because their financial statements and operations are different from other firms. Our final sample includes 455 non-financial businesses listed on HOSE and HNX in the 2008-2018 period.

3.3. Research methodology

3.3.1. Research model

Because the data used in this study is panel data to measure the factors that affect the firm's dividend rate, firstly, we use two models for testing which are Random Effect Model (REM) model and Fixed Effect Model (FEM) model. Then, using the Hausman test (Hausman test) to select the most suitable model. These two models have the following form:

Formula:

$$Y_{it} = \alpha + \sum \beta_k X_{kit} + \varepsilon_{it}$$

In which:

- The dependent variable (Y_{it}) is the dividend rate on a par value of the firm i ;
- X_{kit} is the independent variable and explained in detail in Table 3.2.

In this paper, the multicollinearity regression model was developed based on the variables defined in previous studies with the Payout Dividend variable as a dependent variable and the variables Past_Dividend, Current_Ratios, EPS, ROE, Size, Leverage, Foreign_Owner, Growth, Sex are independent variables. The model was developed based on the general formula of table data as follows:

$$\text{Payout Dividend}_{it} = \alpha + \beta_1 \text{Past_Dividend}_{it} + \beta_2 \text{Current_Ratios}_{it} + \beta_3 \text{ROE}_{it} + \beta_4 \text{Size}_{it} + \beta_5 \text{Leverage}_{it} + \beta_6 \text{Growth}_{it} + \beta_7 \text{Foreign_Owner}_{it} + \beta_8 \text{Sex}_{it} + \varepsilon_{it}$$

In which:

- Payout Dividend: Dividend rate of this year
- Past_Dividend: Dividend rate of last year
- Current_Ratios: Current payment index
- ROE: Rate of return
- Size: Business scale
- Leverage: Debt leverage
- Growth: Revenue growth of this year
- Foreign_Owner: Foreign ownership
- Sex: Gender of CEO
- ε : residual error

4. Results

4.1. Descriptive statistical analysis

The research data consists of 1 dependent variable and eight independent variables. A total of 5005 observations of 455 enterprises over the 11 years from 2008 to 2018. The dependent variable Payout_Ratios has an average value of 0.3530; the standard deviation 0.6264; the minimum value is 0, and the maximum value is 5,992.

Size has an average value of 11.2. Firm size ranges from the lowest of 7.77 and the highest of 14.35. Standard deviation is 0.75

The financial leverage has an average value of 2.42, which shows that for every VND 1 of equity paid, the company borrowed an additional VND 2.42. The highest financial leverage is 8.58 and the lowest in the number of companies that do not borrow. The standard deviation is 1.2.

The past dividend has an average value of VND 722, indicating that the average investor holding one share will receive VND 722 of dividends. The highest dividend is VND 29,411, and the lowest is an amount in which some companies do not pay dividends. The standard deviation is VND 1308.

The return on equity (ROE) has an average value of 14.47%, indicating that the average business earns 14.47% from one equity. This index ranges from the lowest of -99.93%, and the highest is 110.64%. The standard deviation is 14.32%.

The average growth rate of revenue is 17%. The highest growth was 102.5%, and the lowest was -100%. The standard deviation is 53%.

The current ratio has an average of 2.1 times. The highest solvency is 47.77 times, and the lowest is 0 times. The standard deviation is 2.3 times.

The percentage of foreign ownership has an average value of 7.2%. The highest percentage of foreign ownership is 76.2%, and the lowest is 0% in some businesses. The standard deviation is 9.4%.

The gender of CEO has an average value of 0.92, which shows that for every 100 CEOs, there are 92 male CEOs and eight women CEOs.

4.2. Empirical analysis

4.2.1. Regression results

Regression according to FEM model: Regression analysis results using a fixed-effect model (FEM) show that capitalization (Size); Past dividends (Past_Dividend) positively correlate with dividend payout ratio (Payout_Ratios) with a statistical significance of 1%. In contrast, return on equity (ROE); negatively correlated with the dividend payout ratio (Payout_Ratios) with a statistical significance level of 1%. While the current payment index (Current_Ratios), financial leverage (Leverage); foreign ownership ratio (Foreign_Owner); Gender of CEO (Sex); Revenue growth (Growth) are not statistically significant.

The results from the random-effect model (REM) show the current accounting index (Current_Ratios); Past dividends (Past_Dividend) are positively correlated with dividend payout ratio (Payout_Ratios) with statistical significance at 5% and 1% respectively. In contrast, return on equity (ROE); Capitalization (Size) has a negative correlation with dividend payout ratio (Payut_Ratios) with a statistical significance level of 1%, 5%, respectively. On the other hand, the foreign ownership ratio (Foregin_Owner), revenue growth (Growth); Gender of CEO (Sex); Financial leverage (Leverage) are not statistically significant.

4.2.2. Hausman test to choose between FEM and REM models

We follow Baltagi (2008, p. 320) and Gujarati (2004, p. 652) to apply the Hausman test to select an appropriate estimation method between two estimation methods. Hypothesis H₀ states that there is no correlation between explanatory variables and random components in the model. The RE estimate is reasonable under the H₀ hypothesis but not consistent with the alternative hypothesis. The F.E. estimate is reasonable for both the H₀ hypothesis and the alternative hypothesis. However, in case the null hypothesis H₀ is rejected, the fixed impact estimate is more appropriate than the random impact estimate. Conversely, if there is insufficient evidence to reject H₀, which means that the correlation between errors and explanatory variables cannot be ruled out, the fixed impact estimates are no longer appropriate, and the random estimates will be used.

Put the following hypothesis:

H₀: There is no correlation between explanatory variables and random components.

H₁: There is a correlation between explanatory variables and random components.

Hausman test results have P-value (= 0.0000) with a 1% significance level. So the FEM model is more suitable than the REM model.

4.2.4. Verify the autocorrelation phenomenon

Wooldridge test application to test the autocorrelation phenomenon with the following hypothesis:

H₀: There is no autocorrelation.

H₁: There is a similar correlation.

From the results of Table 4.2.4, we see the value P-value (= 0.0048) < α with a significance level of 1%. So the model does have an autocorrelation phenomenon.

4.2.5 Check the phenomenon of error variance

Give assumptions

H_0 : Without the variance of the error variance change

H_1 : With the variance of the error variance change

Because P-value (= 0.0000) < α has significance level of 1%, 5%, 10%. So, the model has a variance change phenomenon.

4.2.6. Regression results after correcting the phenomenon of error variance

Table 4.2.6 provide Wald test results. We find out that the size has a negative relationship with the dividend payout ratio. This result is not consistent with Collins *et al.* (1996); Mitton (2004) and Li & Lie (2006). When the firm size increases by 1%, the managers tend to reduce dividends by 2.2 %. The reason behind this trend is that the company is still able to grow, so managers retain additional profits for reinvestment. Therefore, dividend payments reduce accordingly.

Besides, the past dividend variable (Past_Dividend) aims to evaluate the impact of past dividend payments on the future dividend payout ratio. The estimation results using the fixed effects model (FEM) show that the past dividend payment **positively** relates to the dividend payout ratio. This finding is consistent with the study of (Lintner, 1956), showing that the impact of past dividend payments has a substantial impact on dividends this year. Accordingly, when dividends in the past increased by 1%, enterprises tended to pay 0.27% more than the previous year.

Moreover, the return on equity (ROE) measures the effect of profitability on dividend payout. The regression results show that the ratio of return on equity and dividend payout ratio **negatively** correlates at the statistically significant 5% level. Specifically, when the ratio of profit on equity increased, the company tended to pay dividends less than 29.97%. This result is consistent with Franklin and Muthusamy (2010), while it is not consistent with Le *et al.* (2010).

Finally, the gender of the CEO (Sex), has a positive correlation with the dividend payout ratio (Payout_Ratios). The result shows that male CEOs tend to pay 1.5% higher dividends than female CEOs. This finding is not consistent with Khan and Vieito (2013)

5. Conclusion

This research examines the factors affecting the dividend payout ratio of non-financial companies listed on HOSE & HNX in Vietnam within 11 years from 2008-2018. The factors that affect the dividend payout ratio are determined based on previous studies in different markets around the world.

Endogenous factors identified as affecting the dividend payout ratio include firm size, financial leverage, past dividends, return on equity, and revenue growth, current payment index, foreign ownership ratio, CEO gender. The results indicate the positive relationship between Past_Dividend; and CEO gender on the dividend payout ratio of 455 enterprises listed on HOSE & HNX. However, firm size and ROE has a negative relationship with dividend payments.

Appendix: Tables of descriptions and results

Table 3.1: Summary of results of some previous studies

No.	Research	Factors	Affect
1	John Lintner (1956) "Distribution of Incomes of Corporations Among Dividends, Retained Earnings and Taxes", <i>American Economic Review</i> , Vol. 46, pp. 97-113	Dividends paid in year t-1	+
2	Brittain (1966) "Corporate Dividend Policy", <i>The Brookings Institution</i> , Washington, D.C.	Dividends paid in year t-1	+
3	Smith & Wallts (1992) "The Investment Opportunity Set and Corporate Financing, Dividend, and Compensation Policies", <i>Journal of Financial Economics</i> , 32(3), pp. 263-292	Size Revenue growth Financial leverage	+ - +
4	Gaver (1993) "Additional Evidence on the Association between the Investment Opportunity Set and Corporate Financing, Dividend, and Compensation Policies", <i>Journal of Accounting and Economics</i> , 16(1), pp. 125-160	Size Growth possibility Financial leverage	+ - +
5	Ahmed và Attiya (2009) "Dynamics and Determinants of Dividend Policy in Pakistan (Evidence from Karachi Stock Exchange Non Financial Firms)", <i>International Journal of Finance and Economics</i> , Vol.25, pp. 148-171.	Income of year t Past dividends Revenue growth Size	Effective Effective No effective -
6	He and Li (2009) "Determinants of Dividend policy in Chinese Firms: Cash versus Stock Dividends", <i>Journal of Financial Economics</i> , Vol.21, Issue No. 2 (September), pp.149-175.	Financial leverage Percentage of holding cash year Profit	+ + +
7	Sim and Appannan (2011) "A Study on Leading Determinants of Dividend Policy In Malaysia Listed Companies for Food Industry Under Consumer Product Sector", 2nd <i>International Conference on Business and Economic Research</i> (2nd ICBER) Proceeding, pp. 945-976.	Equity rate Dividend per share of year t-1	+ +
8	Thanatawee (2011) "Ownership Structure and Dividend Policy: Evidence from Thailand", <i>International Journal of Economics and Finance</i> , 5(1), pp. 121-132.	Size Profitability Revenue growth Financial leverage	+ + + -
9	Mehta (2012) An Empirical Analysis of Dividend Policy – Evidence from the UAE Companies", <i>Global</i>	Profit Revenue growth	+ No effective

	<i>Review of Accounting and Finance</i> , Vol. 3, No.1, March, pp.18- 31.	Size Financial leverage	+ +/-
10	Mansourinia <i>et al.</i> (2013) "The Effect of Board Size, Board Independence and CEO Duality on Dividend Policy of Companies: Evidence from Tehra Stock Exchange", <i>International Journal of Economy, Management and Social Sciences</i> , 7(2), pp. 237-241	Size Profitability Growth possibility Financial leverage	+ + + -
11	Al-Nawaiseh (2013) "Dividend Policy and Ownership Structure: An Applied Study on Industrial Companies in Amman Stock Exchange", <i>Journal of Management Research</i> , 5(2), pp. 83-106	Size Profitability Financial leverage Shareholder structure	+ + - +

Note: "+" positive, "-" negative

Table 3.2: Formula to calculate variables and expectation about signs

<i>Variable</i>	<i>Symbol</i>	<i>Formula</i>	<i>Expectations about the sign</i>
Dependent variable			
Dividend payout ratio	Payout Dividend	$\frac{\text{Dividend per share of year } t}{10.000 \text{ VND}}$	
Independent variables			
Business size	Size	Log (total assets)	+
Financial leverage	Leverage	$\frac{\text{Payables}}{\text{total capital sources}}$	-
Profitability	ROE	$\frac{\text{Profit after tax}}{\text{Equity}}$	+
Past dividends	Past Dividend	Dividend per share of year-1	+
Current Ratios	Current Ratios	$\frac{\text{Current assests}}{\text{Short term assets}}$	-
Revenue growth rate	Revenue Growth Rate	$\frac{\Delta \text{Revenue of year } t}{\text{Revenue of year } t - 1}$	+
Foreign ownership	Foreign	$\frac{\text{Number of foreign owned shares}}{\text{Total foreign shares}}$	+
Gender of CEO	Sex	= 1 if Male = 0 if Female	+

Table 4.1: Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Payout_ratios	5005	.3530221	.626414	0	5.993299
Size	5005	11.2543	.7566381	7.778151	14.35021
Leverage	5005	2.424182	1.244612	0	8.58
Past_Divid~d	5005	722.8428	1308.235	0	29411.76
ROE	5005	.1447757	.1432575	-.9993302	1.106421
Growth	5005	.1760467	.5357466	-1	10.24516
Current_ra~s	5005	2.155327	2.364203	0	47.77
ForeginOwner	5005	.0727568	.094626	0	.7628
Sex	5005	.9248751	.2636191	0	1

Table 4.2.1a: Correlation matrix

	Size	Leverage	Past_D~d	ROE	Growth	Curren~s	Foregi~r	Sex
Size	1.0000							
Leverage	-0.1024	1.0000						
Past_Divid~d	-0.1717	0.0503	1.0000					
ROE	0.2012	-0.0418	0.2061	1.0000				
Growth	0.0254	0.0632	0.0515	0.1787	1.0000			
Current_ra~s	0.0113	-0.3220	-0.0213	0.0376	-0.0325	1.0000		
ForeginOwner	0.0317	-0.0033	-0.0185	-0.0547	-0.0107	0.0129	1.0000	
Sex	-0.0101	0.0621	0.0403	-0.0269	-0.0120	0.0085	-0.0140	1.0000

Table 4.2.1b: VIF coefficient

Variable	VIF	1/VIF
ROE	1.15	0.867263
Leverage	1.14	0.878225
Current_ra~s	1.12	0.893305
Size	1.11	0.902725
Past_Divid~d	1.10	0.906475
Growth	1.04	0.962509
Sex	1.01	0.992182
ForeginOwner	1.01	0.994615
Mean VIF	1.08	

Table 4.2.2a: FEM regression results

Fixed-effects (within) regression	Number of obs	=	5005
Group variable: Code1	Number of groups	=	455
R-sq: within = 0.2172	Obs per group: min =		11
between = 0.3184	avg =		11.0
overall = 0.2428	max =		11
	F(8,4542)	=	157.49
corr(u_i, Xb) = 0.0821	Prob > F	=	0.0000

Payoutratios	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
Size	.0921716	.0338381	2.72	0.006	.0258324	.1585107
Leverage	-.0131363	.0102458	-1.28	0.200	-.0332231	.0069505
Past_Dividend	.0002268	6.48e-06	35.01	0.000	.0002141	.0002395
ROE	-.4019605	.0682664	-5.89	0.000	-.5357959	-.2681251
Growth	.0220765	.014179	1.56	0.120	-.0057211	.0498742
Current_ratios	.0043837	.0040195	1.09	0.276	-.0034965	.0122639
ForeginOwner	-.0602084	.1502786	-0.40	0.689	-.3548275	.2344106
Sex	.067172	.0845918	0.79	0.427	-.0986691	.2330131
_cons	-.8292718	.395041	-2.10	0.036	-1.603744	-.0547993
sigma_u	.28358046					
sigma_e	.48940042					
rho	.25136034	(fraction of variance due to u_i)				

F test that all u_i=0: F(454, 4542) = 2.91 Prob > F = 0.0000

Table 4.2.2b: Regression results of REM model

Random-effects GLS regression	Number of obs	=	5005
Group variable: Code1	Number of groups	=	455
R-sq: within = 0.2133	Obs per group: min =		11
between = 0.4797	avg =		11.0
overall = 0.2836	max =		11
	Wald chi2(8)	=	1620.13
corr(u_i, X) = 0 (assumed)	Prob > chi2	=	0.0000

Payoutratios	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Size	-.0318584	.0144114	-2.19	0.029	-.0598041	-.0039126
Leverage	.0110555	.007722	1.43	0.152	-.0040792	.0261903
Past_Dividend	.0002392	6.11e-06	39.14	0.000	.0002272	.0002512
ROE	-.4941345	.0597239	-8.27	0.000	-.6111913	-.3770778
Growth	.006551	.0138205	0.47	0.635	-.0205367	.0336386
Current_ratios	.0075391	.0035912	2.10	0.036	.0005005	.0145776
ForeginOwner	.1029952	.1014916	1.01	0.311	-.0960249	.2019151
Sex	.018555	.0400502	0.46	0.643	-.059942	.0970519
_cons	.5379849	.1693757	3.18	0.001	.2060147	.8699551
sigma_u	.18949365					
sigma_e	.48940042					
rho	.13037457	(fraction of variance due to u_i)				

Table 4.2.3: Hausman test results

	Coefficients		(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
	(b) fem	(B) rem		
Size	.0921716	-.0315584	.12373	.0306158
Leverage	-.0131363	.0110555	-.0241919	.0067341
Past_Divid~d	.0002268	.0002392	-.0000124	2.15e-06
ROE	-.4019605	-.4941345	.0921741	.033066
Growth	.0220765	.006551	.0155256	.0031682
Current_ra~s	.0043837	.0075391	-.0031554	.0018055
ForeginOwner	-.0602084	.1028952	-.1631036	.1108291
Sex	.067172	.018555	.048617	.0745101

b = consistent under Ho and Ha; obtained from xtreg
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(7) = (b-B)' [(V_b-V_B)^(-1)] (b-B)
 = 76.47
 Prob>chi2 = 0.0000

Table 4.2.4: Test results of autocorrelation phenomenon

Wooldridge test for autocorrelation in panel data

H0: no first-order autocorrelation

F(1, 454) = 8.025
 Prob > F = 0.0048

Table 4.2.5: Test results of variance change phenomenon

Modified Wald test for groupwise heteroskedasticity
 in fixed effect regression model

H0: $\sigma(i)^2 = \sigma^2$ for all i

chi2 (455) = 2.4e+08
 Prob>chi2 = 0.0000

Table 4.2.6: Regression results after correcting phenomena the variance of error change, autocorrelation

Cross-sectional time-series FGLS regression

Coefficients: generalized least squares
Panels: heteroskedastic
Correlation: common AR(1) coefficient for all panels (0.5379)

Estimated covariances = 455 Number of obs = 5005
Estimated autocorrelations = 1 Number of groups = 455
Estimated coefficients = 9 Time periods = 11
Wald chi2(8) = 4037.79
Prob > chi2 = 0.0000

Payoutratios	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Size	-.022417	.0037841	-5.92	0.000	-.0298337	-.0150003
Leverage	-.0021125	.0026177	-0.81	0.420	-.0072431	.0030181
Past_Dividend	.0002747	4.50e-06	61.11	0.000	.0002659	.0002835
ROE	-.2997684	.0179103	-16.74	0.000	-.3348718	-.2646649
Growth	.0017978	.0036226	0.50	0.620	-.0053024	.0088981
Current_ratios	.0013998	.0011849	1.18	0.237	-.0009226	.0037222
ForeginOwner	.0268667	.0295506	0.91	0.363	-.0310514	.0847847
Sex	.0152055	.0087178	1.74	0.081	-.0018811	.0322921
_cons	.3347731	.045508	7.36	0.000	.245579	.4239672