Profitability, Growth Opportunities, and Mix of Earned and Contributed Capital as Determinants of Dividend Policy: Empirical Evidence from Nikkei 225

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Abstract

This paper investigates the effects of profitability, growth opportunities, and mix of earned and contributed capital as determinants of dividend policy on firms' decisions to pay dividend and the level of payouts. This paper focuses on firms listed in Nikkei 225 from 2004 until 2016. Logit model is employed in order to examine firms' decisions to pay dividend, and tobit model is also used to determine the dividend payout ratio. The results suggest that firms with high profitability and mix of earned and contributed capital tend to pay dividend with higher payout ratio. On the one hand, rapid growth firms have contradictory outcomes compared to other determinants. These findings also provide empirical evidence for the pecking-order theory and free cash flow hypothesis.

Chapter 1. Introduction

In this era, people has been growing concerns about finance and investment. Several types of investment are offered, one of the most preferred one is dividend. Dividend is considered as incentive for shareholders to invest in certain companies, which explains why stock markets have sensitive reaction towards dividend announcement. React positively on the assumption that dividend paid increases, react negatively whenever dividend paid decreases. Therefore, most firms aim a stable dividend policy to signal the firms' earnings prospects.

Dividend payment has become one of the considerations for the investors to invest or not to invest in companies in certain industries. Thus, the decision to pay dividend and the percentage to pay dividends are determined by several factors: profitability, growth opportunities, and mix of earned and contributed capital, in which will be further discussed in this paper.

Theorists believe when a firm generates free cash flow, it is the managers' decisions to decide whether the cash available will be paid out to shareholders as dividends, or to be allocated as investment in order to increase firm's value. Managers consider that by allocating the cash available as investments, it will generate positive NPV. However, if firms prefer allocating the cash available as investment opportunities to dividend, the firms tend to either not paying dividends or paying dividend with low ration. This theory holds in most western hemisphere countries where larger profitability determines the tendency of a firm to pay dividend. Furthermore, growth opportunities appear to have negative relationship with dividend payout ratio. However, since most Eastern Asian firms have distinct characteristics compared to most western hemisphere firms, the condition may be not similar.

For the past decades, Asian stock markets have been developing swiftly. As it can be seen that numerous Japanese companies are also expanding their target market by establishing production facilities overseas as part of their investments. Due to the lack of findings about determinants of dividend policy in Asia, therefore, this paper aims to discuss whether profitability, growth

opportunities, and mix of earned and contributed capital affect firms' decisions to pay dividend in companies listed in Nikkei 225.

Furthermore, the research questions arise from this paper are:

1. *How do profitability, growth opportunities, and the mix of earned and contributed capital determine companies listed in Nikkei 225' decisions to pay dividend?*

2. *How do profitability, growth opportunities, and the mix of earned and contributed capital influence to the extent of dividend payment companies listed in Nikkei 225?*

This paper's objective is to provide the empirical evidence of determinants of dividend policy in Nikkei 225' firms, which is not much discussed previously by scientific papers. Besides, by analysing Nikkei 225' firms, this paper gives different perspectives about corporate dividend policy. Since Eastern Asia indices appear to have similar characteristics, these findings may indicate similar results although it cannot be fully generalised. However, this paper discusses Nikkei 225' dividend payer firms in general without subdivide the firms into *keiretsu* and non*keiretsu* firms.

Since this paper conducts research on Nikkei 225' firms within period 2004-2016, thus panel data is employed. Six hypotheses are developed in this study, to depict the effects of each determinants of dividend policy on firms' decisions to pay dividend and the payout levels. Therefore, this paper conducts its research by using logit and tobit model. Yet, linear probability model and multiple linear regression are also performed to ensure the results are consistent.

In addition, the results suggest that profitability, growth opportunities, and mix of earned and contributed capital significantly influence the determinants of dividend policy. However, each determinant generates various results. Profitability and mix of earned contributed capital appear to have positive influence on firms' decisions to pay dividend and the dividend payout ratio. While, it appears to happen otherwise for growth opportunities. These findings provide strong support for the pecking-order theory and free cash flow hypothesis.

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By examining Nikkei 225, this paper addresses the effects of profitability, growth opportunities, and mix of earned and contributed capital as determinants of dividend policy in Eastern Asia markets. Nikkei 225 is chosen since it is the oldest and one of the most developed in Eastern Asia.. By conducting this research, this paper will contribute to give further insights about financial markets and dividend policy in Eastern Asia indices which have different characteristics in terms of culture, politics, and macro-economic compared to western hemisphere countries.

This paper is structured as follows. Literature review is defined in section 2. Section 3 discusses about hypothesis testing. Results and interpretations are explained in section 4. Conclusions will be interpreted in section 5. There will be references and appendices at the end of this paper.

Chapter 2.   Literature review

2.1   Dividend policy

By definition, dividend policy is the decision as to how much of current earnings to pay out as dividends rather than retain for reinvestment in the firm (Brigham and Houston, 2013:547). Table below will explain several dividend policy theories which related to this paper's findings.

Table 1. Literatures on dividend policy

Dividend policy theories	Authors	Findings
Pecking-order theory	Myers and Majluf (1984)	- Firms can limit dividend payments despite excessive cash held when investment is required. - The firm should not pay a dividend if it has to compensate the cash by selling stock or some other risky security, even though dividends could help convey managers' superior information to the market.
Free cash flow hypothesis	Jensen (1986)	- Firms' revenues rise as unexpected increases in payouts to shareholders, and firms' revenues fall as payments or new requests for funds are devalued.

These proposed theories trigger other researchers to conduct further studies related to dividend policy and its determinants. Referring to these theories, recent findings appear to be consistent with these theories.

Bhattacharya (1979) as cited by Yosef and Huffman (1988) suggested that, if stockholders have imperfect information about firms' profitability, and if there is a tax rate differential between capital gains and dividends, then dividends will be a surrogate for a signal of expected cash flows. Furthermore, Yosef and Huffman (1988) hypothesized that corporate management sets target dividend payment ratios, and there exists a consistent relationship between risk

measures and corporate dividend policy. Then they concluded that the size of the declared dividend is an increasing function of expected cash flow.

According to Denis et al. (1994), a dividend increase by a firm with free cash flow problems will reduce the market's estimate of the amount of cash that will be wastefully invested, thereby increasing firm value. Similarly, a dividend decrease by such a firm will signal that more negative NPV projects will be undertaken, causing a decrease in firm value. However, they could not find the empirical evidence whether dividend change announcements convey some information about the investment policy of the firm.

On the other hand, Fama and French (2001) found out that new listed companies continue to have high asset growth rates, but their profitability falls. In addition, in the next several years, they found the evidence that, controlling for characteristics, firms become less likely to pay dividends says that the perceived benefits of dividends have declined through time (Fama and French, 2010).

AlNajjar and Riahi-Belkaoui (2001) probed dividend policy from different perspectives from Fama and French findings. They found that multinational firms with high growth opportunities, have an incentive to resort to accruals or other means to reduce their reported income numbers compared to low growth opportunity and low income number firms.

However, according to LaPorta et al (2000) unless profits are paid out to shareholders, they may be diverted by the insiders for personal use or committed to unprofitable projects that provide private benefits for the insiders. Furthermore, another finding indicated that past earnings and dividend patterns matter when firms change their dividend policy (Charitou et al, 2010).

On the other hand, DeAngelo et al (2005) concluded that publicly traded industrial firms that pays dividends is high when retained earnings are a large portion of total equity (and of total assets) and falls to near zero when most equity is contributed rather than earned, as they found that firms with negative retained earnings show virtually no change in their propensity to pay dividends from the mid-1970s to 2002, while those whose earned equity makes them reasonable candidates to pay dividends have a propensity reduction.

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2.2   Dividend Payout Ratio

By definition, dividend payout ratio is the percentage of profits paid as dividend (Amidu and Abor, 2006). To the extent that stockholders can switch firms, a firm can change from one dividend payout policy to another and then let stockholders who do not like the new policy sell to other investors who do. (Brigham and Houston, 2013).

Past dividends and current earnings are the primary determinants of current dividends and managers prefer to maintain stable dividends and make periodic adjustments toward a target payout ratio (Lintner, 1956). In addition, Brav *et al*. (2005) found that the perceived stability of future earnings still affects dividend policy but the link between dividends and earnings is weaker. According to Perretti, Allen, and Weeks (2013), profitability and home-country macro-economic conditions do not affect the decision to pay dividends. In addition to that, in countries with adequate legal protection for minority shareholders, shareholders are willing to forgo dividend payments when firms have high growth opportunities (LaPorta et al., 2000).

Fama and French (2001) hypothesized that firms that have never paid dividends are more profitable than former payers and they have strong growth opportunities, while firms that have never paid invest at a higher rate, do more R&D, and have a higher ratio of the market value of assets to their book value than dividend payers. They noticed that the investments of dividend payers are on the order of pre-interest earnings, but the investments of firms that have never paid exceed earnings.

According to Gugler (2003) hypothesis, shareholders of a firm with good investment opportunities may find it optimal to realize profitable growth opportunities and wait for dividends.   In which his finding is relevant to LaPorta et al (2000). LaPorta et al (2000) found that fast growth firms pay lower dividends than slow growth firms, consistent with the idea that legally protected shareholders are willing to wait for their dividends when investment opportunities are good.

In comply to Linter (1956) and Baker et al (1985), they indicate dividend payment pattern of a firm is influenced by the current year's earnings. Moreover,

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Gil et al (2010) thought that a poor liquidity position examines less generous dividend due to shortage of cash, which implies company's ability to pay dividends.

3. Hypothesis Testing and Methodology

This paper mainly discusses determinants of dividend policy in Nikkei 225's listed firms. This index includes 225 firms from various industries mainly located in Japan. The data used in this paper is all publicly traded firms listed on Nikkei 225 index (NKY) from the period 2004-2016 which is obtained from the Datastream. The period that is used for the empirical study is the period of post-Asian economic crisis.

Since the period observed is from 2004-2016, data needed is lacking. Thus, several firms are excluded from the observations which makes this paper includes 182 firms listed in Nikkei 225 instead of 225 firms. Total number of observations is 569,842.

Table 2 Descriptive statistics

Variable		Obs	Mean	Std. Deviation	Min	Max
DPS	Overall	N = 569842	27.5245	35.991	0	773.79
	Between	n =182		30.0689	0.6675	194.0402
	Within	T = 3131		19.9062	-130.9613	620.8287
DPR	Overall	N = 569842	26.71	19.0393	0	98.96
	Between	n =182		9.3269	4.800	62.9156
	Within	T = 3131		16.6127	-23.591	100.1538
Pi	Overall	N = 569842	6.810	21.685	-845.44	131.56
	Between	n =182		7.5486	-72.549	28.9595
	Within	T = 3131		20.3364	-766.0812	142.6965
GROWTH	Overall	N = 569842	60.836	19.3698	0	98.60
	Between	n =182		18.677	13.139	96.946
	Within	T = 3131		5.3296	-17.441	91.386
EARNEDCAP	Overall	N = 569842	61.04	41.067	-833.524	1092.416
	Between	n =182		24.783	-41.75	112.775
	Within	T = 3131		32.797	-730.734	1047.458
SIZE	Overall	N = 569842	1.21e+09	1.89e+09	0	2.64e+10
	Between	n =182		1.75e+09	4.52e+07	1.63e+10
	Within	T = 3131		7.24e+08	-5.29e+09	1.13e+10

NICommon	Overall	N = 569842	6.69e+09	1.69e+08	-1.25e+099	2.31e+09
	Between	n =182		1.31e+08	-7.90e+07	1.14e+09
	Within	T = 3131		1.07e+08	-1.51e+09	1.24e+09
dumDPS	Overall	N = 569842	0.955	0.2082	0	1
	Between	n =182		0.1061	0.30884	1
	Within	T = 3131		0.1791	-0.04	1.646

DPS: Dividend per Share
DPR: Dividend Payout Ratio
Pi: Profitability
GROWTH: Growth opportunities
EARNEDCAP: Earned/contributed capital
Size: measured by market capitalization
dumDPS: Dummy variable of DPS

Table 2 presents descriptive statistics of all variables used. The table summarizes the mean, standard deviation, minimum, maximum, and the number of observations across the whole dataset. On average, Nikkei 225 firms' dividend levels are approximately 26.71 percent. Independent variables' values represented in the tables are in percentage. Considering panel data used in this paper, there are three standard deviations reported: overall, between, and within. Overall determines the percentage value of all firms from all time periods. Between examines the percentage value of variables across firms from a certain period, while within only determines the percentage value of variables of a firm from all time periods.

Determinants of dividend policy

The variables with a formula are elaborated in this section:

- DumDPS as dummy variable of dividend per share. It equals to 1 if the firm pays dividend, equals to 0 if the firm does not pay dividend.

- Pi refers as profitability. It is measured by using return on equity (ROE), formulated as below,

$$ROE = Net\ Income/Total\ Equity$$

- Growth opportunities

Composed of the value of assets in place and the value of expected future investment options (Al-Najjar and Belkaoui, 2001). Firms with growth opportunities should consider more internal control mechanisms to

enhance firm performance (Hutchinson and Gul, 2003). Formulated as below,

$$Growh\ opportunities = \frac{(book\ value\ of\ total\ assets - the\ book\ value\ of\ equity\ +\ the\ market\ value\ of\ equity)}{total\ assets}$$

- Mix of earned and contributed capital

    Mix of earned and contributed capital plays a statistically significant in determining dividend paying class (Perretti et al., 2013). Formulated as below,

$$Mix\ of\ Earned\ and\ Contributed\ Capital = \frac{retained\ earnings}{book\ value\ of\ equity}$$

- Size

    Size is determined as control variable. Therefore, in this case size is measured from market capitalization. The formulation is as follows,

$$Market\ capitalization = share\ price \times number\ of\ shares\ oustanding$$

- Net income available to common

    Net income available to common is determined as control variable. It is profits remaining after total expenses and preferred dividends.

3.1 Hypothesis testing

This paper investigates the influence of profitability, growth opportunities, and mix of earned and contributed capital as determinants of dividend policy. By mentioning dividend policy, this paper discusses whether these determinants affect firms' decisions to pay dividends quarterly. Therefore, the hypotheses are constructed as below,

H1: Firms with high profitability have higher tendency to pay dividends regularly.

H2: Firms with high growth opportunities are less likely to pay dividends regularly.

H3: Firms with mix of earned and contributed capital have higher tendency to pay dividends regularly.

This paper also discusses how profitability, growth opportunities, and mix of earned and contributed capital as determinants of dividend policy affect

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the level of dividend payments in Nikkei 225's firms. The hypotheses are constructed as below,

>H4: Profitability has positive relationship with dividend payouts.

>H5: Growth opportunities has negative relationship with dividend payouts.

>H6: Mix of earned and contributed capital has positive relationship with dividend payouts.

3.2 Methodology

The data in this research is panel data. Panel data have the dimensions of both time series and cross-sections (Brooks, 2008). Since this is panel data, time fixed effect is included, and time variable is set quarterly.

Multiple regressions performed to test whether profitability, growth opportunities, and mix of earned and contributed capital as determinants of dividend policy on firms' decisions to pay dividends in dividend per share (DPS) is employed. Regressions performed are linear probability model and logit regression.

3.2.1 Linear probability model

To test the hypotheses, the first method used is linear probability model. According to Gujarati (2004), linear probability model is an approach to developing a probability model for a binary response variable, in which the regressand is binary, or dichotomous (conditional probability). The formula is constructed as below,

$$Dum_{DPS} = \alpha_i + \beta 1 Pi_{i,t} + \beta 2 GROWTH_{i,t} + \beta 3 EARNEDCAP_{i,t} + \beta 4 SIZE_{i,t} + \beta 5 NICommon_{i,t} + \lambda_t + v_{i,t}$$

3.2.2 Logit regression

Second method employed is logit regression. The logit model approach is able to overcome the limitation of the LPM that it can produce estimated probabilities that are negative or greater than one (Brooks, 2008).

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$$dumDPS = ln\left(\frac{Pi}{1 - Pi}\right)$$

$$= \alpha_i + \beta 1 Pi_{i,t} + \beta 2 GROWTH_{i,t} + \beta 3 EARNEDCAP_{i,t} + \beta 4 SIZE_{i,t}$$
$$+ \beta 5 NICommon_{i,t} + \varepsilon_i$$

Dividend policy (as decision to pay dividend), as proxy by dummy variable. The equation is shown as below,

$$dumDPS = ln\left(\frac{Pi}{1-Pi}\right), \text{ as dummy variable.}$$

In order to acknowledge whether profitability, growth opportunities, and mix of earned and contributed capital have influence on the level of dividend payouts, multiple linear regression and tobit regression are performed. Dividend Payout Ratio (DPR) as a proxy of the extent of a dividend payment, will be examined in percents (%). The equation is explained below,

$$Dividend\ Payout\ Ratio\ (DPR) = \ Dividend/Net\ Income$$

3.2.3 Multiple linear regression

Regression used to test to what extent these variables influence dividend payout ratio is multiple linear regression analysis. The multiple regression model, a model in which there is more than one explanatory variable, and show how the method of OLS can be extended to estimate the parameters of such models (Gujarati, 2004).

$$DIV_{i,t} = \alpha_i + \beta 1 Pi_{i,t} + \beta 2 GROWTH_{i,t} + \beta 3 EARNEDCAP_{i,t} + \beta 4 SIZE_{i,t}$$
$$+ \beta 5 NICommon_{i,t} + \lambda_t + v_{i,t}$$

$DIV_{i,t}$ referred as dividend payout ratio, determines to what extent the firms are willing to pay dividend to the shareholders.

3.2.4 Tobit regression

The regression is obtained by making the mean in the preceding correspond to a classical regression model, in which the general formulation is usually given in terms of an index function (Greene, 2002). Dependent variables are censored at zero for firms that do not pay dividends, since tobit estimation eliminate biases associated with OLS regressions in the presence of censored dependent variables (Kim and Maddala, 1992; and Greene, 2003 as cited by Adjaoud and Ben-Amar, 2010). Formulated as follows,

$$DIV_{i,t} = \alpha_i + \beta 1 Pi_{i,t} + \beta 2 GROWTH_{i,t} + \beta 3 EARNEDCAP_{i,t} + \beta 4 SIZE_{i,t} + \beta 5 NICommon_{i,t} + \varepsilon_i$$

Assume,

$y_i* = x_i'\beta + \varepsilon_i,$

$y_i = 0 \qquad \text{if } y_i* \leq 0,$

$y_i = y_i* \qquad \text{if } y_i* > 0.$

Univariate and multivariate regressions

Univariate and multivariate regressions are performed to compare the coefficients of each variables by including control variables in multivariate regression. By including control variables in multivariate regression, the control variables provide a method of statistically controlling the effects of quantitative regressors (Gujarati, 2004).

Robustness checks

In order to ensure the regressions performed are valid and robust, multicollinearity and heteroskedasticity test are conducted. Multicollinearity test is done by employ variance-inflating factors (VIF), and heteroskedasticity test by employ Breusch-Pagan test. In addition, to accommodate any heteroskedastic data, panel generalised least squares model (GLS) is executed.

4.   Results and Interpretation

In order to ensure the results are robust and consistent, we conducted several diagnostic tests. To detect multicollinearity, variance inflation factors (VIF) was performed for the independent variables. The estimated VIF values are small with an average of 1.84, it is implying that multicollinearity does not exist between the variables.

Table 3.1 Multicollinearity test using VIF

Variable	VIF	1/VIF
Pi	1.08	0.923
EARNEDCAP	1.16	0.863
GROWTH	1.13	0.885
SIZE	2.86	0.350
NICommon	2.99	0.334
Mean VIF	1.84	

Heteroskedasticity test is also performed to ensure the regression performed is robust and consistent. Thus Breusch-Pagan test is done and it shows that heteroskedaticity detected with Prob > chi-squared is 0.00 (significant). To accommodate this problem, panel data generalized least squares (GLS) models is implemented.

Table 3.2 Panel data generalized least squares (GLS) models

Number of obs	569,842			
Number of groups	182			
Prob > chi-squared	0.00			
Wald chi-squared (3)	925.16			
Variable	Coefficient	Std. Error	T-statistics	Prob>|t|
Pi	0.0000588	5.68e-06	10.35	0.00
GROWTH	-0.0000387	2.85e-06	-13.61	0.00
EARNEDCAP	0.0000621	2.60e-06	23.90	0.00
SIZE	1.16e-13	6.36e-14	1.82	0.069

| NICommon | -2.77e-13 | 8.44e-13 | -0.33 | 0.742 |
| _cons | 0.996 | 0.0002641 | 3771.38 | 0.00 |

After conducting multicollinearity and heteroskedasticity test, then regressions are performed to corresponds the research questions address in this paper.

4.1 Dividend per share

The first research question addresses to know whether these explanatory variables significantly affect the firms' decisions to pay or not to pay dividends. Methodology used are linear probability model and logit regression. These models examine whether firms are paying dividends or otherwise by employing profitability, growth opportunities and mix of earned and contributed capital as independent variables. Dependent variable is dividend per share (DPS), in form of dummy variable. Dummy variable of dividend per share (DPS) examines either firms pay dividends (valued at 1), or do not pay dividends (valued at 0). Since it is a panel data regression, time-fixed effects are applied on the regression.

4.1.1. Linear probability model

Linear Probability Model is formulated as below,

$$Dum_{DPS} = \alpha_i + \beta 1 Pi_{i,t} + \beta 2 GROWTH_{i,t} + \beta 3 EARNEDCAP_{i,t} + \beta 4 SIZE_{i,t} + \beta 5 NICommon_{i,t} + \lambda_t + v_{i,t}$$

Table 4.1 examines the influence of determinants of dividend policy (profitability, growth opportunities, and mix of earned and contributed capital) on firms' decisions to pay dividends in which the dummy variable of dividend per share (dumDPS) used as proxy. This table clearly reports the probability of firms' tendency to pay dividends by using linear probability model.

Table 4.1 shows us that model 1, 2, and 3 exclude size and net income available to common shareholders as control variables. On the other hand, model 4 includes size and net income available to common shareholders as control variables. Yet, this table generated similar results despite the models' differences by excluding/including size and net income available to common shareholders as control variables.

Table 4.1 Linear probability model results

Independent Variables	Model 1 Coefficient estimates	Model 1 Std. Error	Model 2 Coefficient estimates	Model 2 Std. Error	Model 3 Coefficient estimates	Model 3 Std. Error	Model 4 Coefficient estimates	Model 4 Std. Error
Dependent Variable = DumDPS								
Constant								
Pi	0.9521 (3806.65)	0.0002501					1.264 (435.71)	0.00290
GROWTH			1.345 (503.62)	0.00267				
EARNEDCAP					0.9142 (1836.39)	0.000498		
Pi	0.0003639 (31.20)	0.000117					0.0003379 (28.65)	0.0000118
GROWTH			-0.00641 (-146.66)	0.0000437			-0.00585 (-130.98)	0.000045
EARNEDCAP					0.000662 (92.08)	7.18e-06	0.0005328 (74.40)	7.16e-06
SIZE							1.52e-11 (38.98)	2.73e-12
NICommon							-9.75e-11 (-35.78)	2.73e-12
No. of obs.	569,842		569,842		569,842		569,842	

P-value					
Pi	0.0000			0.0000	
GROWTH		0.0000			
EARNEDCAP			0.0000		
R-squared					
Pi	0.2312			*Within*	0.0489
GROWTH		0.0791		*Between*	0.1108
EARNEDCAP			0.1782	*Overall*	0.0490
Sigma u				0.1301	
Sigma e				0.175	
Rho				0.3566	

Model 1, 2, 3 represent univariate regression, model 4 represents multivariate regression

As it can be deducted from the table, all the variables are statistically significant at 1 percent level. From model 4, profitability is significantly positive with firm's decisions to pay dividend, as its coefficient is 0.0003379. Meaning that, the higher the profitability of the firm, the probability of the firms to pay dividend is 0.03 percent. Growth opportunities are significantly negative with firm's decisions to pay dividend, as its as its coefficient appear to be -0.00585. It indicates that the higher the growth opportunities of the firm, the less tendency of the firm to pay dividend as they will allocate the resources to finance their investment. In particular, rapid growth firms do not pay dividends by 0.6 percent probability. However, this table also shows that mix of earned and contributed capital positively influence firm's decisions to pay dividends (0.0005328). Implying that the higher the mix of earned and contributed capital, the more tendency of the firm to pay dividends (0.05 percent probability).

This finding appears to be consistent with prior findings, which examine that firms with high profitability are more likely to pay dividends. This proves that profitability is an influential determinant of dividend policy in Nikkei 225. On the other hand, growth opportunities is negatively correlated with firms' decisions to pay dividends. As the firms are more likely to allocate the earnings for investment opportunities rather than paying them out as dividends to shareholders.

4.1.2. Logit model

The second model is logit regression, this model is formulated as below,

$$dumDPS = ln\left(\frac{Pi}{1 - Pi}\right)$$
$$= \alpha_i + \beta 1 Pi_{i,t} + \beta 2 GROWTH_{i,t} + \beta 3 EARNEDCAP_{i,t} + \beta 4 SIZE_{i,t} + \beta 5 NICommon_{i,t} + \varepsilon_i$$

Logit regression is conducted to know whether the explanatory variables significantly affect the firm's decisions to pay or not to pay dividends.

Table 4.2 analyses the influence of determinants of dividend policy (profitability, growth opportunities, and mix of earned and contributed capital) on firms' decisions to pay dividends in which the dummy variable of dividend per share (dumDPS) used as proxy. This table clearly reports the probability of firms' tendency to pay dividends by using logit model.

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Table 4.2 Logit model results

	Model 1		Model 2		Model 3		Model 4	
	Dependent Variable = DumDPS							
Independent Variables	Coefficient estimates	Std. Error	Coefficient estimates	Std. Error	Coefficient estimates	Std. Error	Coefficient estimates	Std. Error
Constant								
Pi	2.9451 (431.87)	0.00682					5.642 (58.11)	0.0971
GROWTH			7.1923 (188.38)	0.0382				
EARNEDCAP					5.8794 (129.05)	0.045558		
Pi	0.0191 (28.28)	0.000675					0.006232 (23.65)	0.0002635
GROWTH			-0.0597 (-120.56)	0.000495			-0.0555 (-52.59)	0.0011
EARNEDCAP					0.01041 (51.51)	0.000202	0.0118 (15.53)	0.0007603
SIZE							1.10e-09 (75.35)	2.93e-11
NICommon							-1.76e-09 (-15.02)	1.17e-10
No. of obs.	569,842		569,842		569,842		569,842	

P-value			
Pi	0.0000			0.0000
GROWTH		0.0000		
EARNEDCAP			0.0000	
Pseudo R-squared			
Pi	0.0170			0.2051
GROWTH		0.1062		
EARNEDCAP			0.1990	

Model 1, 2, 3 represent univariate regression, model 4 represents multivariate regression

Consistent with linear probability model, table 4.2 also shows similar results. Moreover, this table also shows us that model 1, 2, 3 and 4 generate similar results. All the variables appear to be statistically significant, as the variables are significant at 1 percent level. From model 4, the coefficient of 0.006232 implies that the higher the profitability increases by 1 percent; the logit goes up by 0.6 percent. The coefficient of growth opportunities (-0.0555) indicates that if growth opportunities goes up by 1 percent, the logit decreases by 5.55 percent. On the other hand, if mix of earned and contributed capital increases by 1 percent, the logit goes up by 1.18 percent.

Similar to linear probability model, regression performed in logit model draws same conclusion. Profitability and mix of earned contributed capital are positively associated as determinants of dividend policy. Consistent with prior findings, growth opportunities happen to be negatively associated with firms' decisions to pay dividends. This validates that negative relationship between growth opportunities and firms' decisions to pay dividends, because managers face tradeoff between retaining free cash flow (FCF) as a source of funds for future growth while on the other side, managers want to refrain from paying dividends because internally generated funds provide a less costly, less risky source of capital than tapping into external capital markets (Hail et al, 2013).

These findings in 4 models (univariate and multivariate analysis), which are performed in two regression models occur to be consistent with previous literature. It can be derived that dividend payers tend to be more profitable, have less valuable growth opportunities (Fama and French, 2001; Denis and Osobov, 2008). Moreover, propensity to pay dividends is most strongly associated with the firms' mix of earned and contributed capital, that is the proportion of the firm's equity that is internally generated (DeAngelo et al, 2005; Denis and Osobov, 2008).

4.2   Dividend payout ratio

Then, the second research question addresses to what extent these explanatory variables significantly affect the firms' decisions to pay dividends. Methodology used are multiple linear regression, and tobit regression. It is a panel data regression, time-fixed effects are applied on the regression.

Table 4.3 Multiple linear regression results

Independent Variables	Dependent Variable = DPR							
	Model 1		Model 2		Model 3		Model 4	
	Coefficient estimates	Std. Error	Coefficient estimates	Std. Error	Coefficient estimates	Std. Error	Coefficient estimates	Std. Error
Constant								
Pi	26.353 (1137.65)	0.0232						
GROWTH			52.81 (211.40)	0.25			49.7151 (183.51)	0.271
EARNEDCAP					25.00135 (538.45)	0.046		
Pi	0.0523 (48.39)	0.0011					0.02572 (23.35)	0.00110
GROWTH			-0.429 (-104.88)	0.0041			-0.038 (-90.48)	0.0042
EARNEDCAP					0.028 (41.75)	0.00067	0.0143 (21.39)	0.00067
SIZE							-2.00e-09 (81.90)	3.63e-11
NICommon							2.08e-08 (81.90)	2.55e-10
No. of obs.	569,842		569,842		569,842		569,842	

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P-value					
Pi	0.0000				
GROWTH		0.0000		0.0000	
EARNEDCAP			0.0000		
R-squared					
Pi	0.0454			*Within*	0.0348
GROWTH		0.1716		*Between*	0.1643
EARNEDCAP			0.0928	*Overall*	0.0602
Sigma u				9.283	
Sigma e				16.324	
Rho				0.244	

Model 1, 2, 3 represent univariate regression, model 4 represents multivariate regression

4.2.1. Multiple linear regression

Multiple linear regression is performed, and it is constructed as below,

$$DIV_{i,t} = \alpha_i + \beta 1 Pi_{i,t} + \beta 2 GROWTH_{i,t} + \beta 3 EARNEDCAP_{i,t} + \beta 4 SIZE_{i,t}$$
$$+ \beta 5 NICommon_{i,t} + \lambda_t + v_{i,t}$$

Dividend Pay-out Ratio reflected as $DIV_{i,t}$

Table 4.3 examines to what extent the determinants of dividend policy (profitability, growth opportunities, and mix of earned and contributed capital) affect the payout levels, proxied by dividend payout ratio (DPR). This table represents the results derived from multiple linear regression.

Similar to previous tables, table 4.3 presents model 1, 2, and 3 which exclude size and net income available to common shareholders as control variables; and model 4 which includes the control variables. However, this table generated similar results despite the models' differences by excluding/including size and net income available to common shareholders as control variables.

From model 4, it can be deducted that the profitability, and mix of earned and contributed capital is significantly positive, as they appear to be significant at 1 percent level. It implies that the higher the coefficient of these variables, the firms are more likely to pay higher dividend. On the other hand, growth opportunities is negatively significant on dividend pay-out ratio. Meaning that, the higher the growth opportunities, the firms tend to pay lower dividend. This finding is coherent to prior findings that conclude that high dividend payout is associated with high, rather than low, mix of earned and contributed capital (Arnott and Asness, 2003; Zhou and Ruland, 2006).

Consistent with model 1, 2, and 3, model 4 occurs to derive similar conclusion. Despite the findings retrieved from this regression model appear to be consistent with previous literature, this method has several drawbacks. It is biased, and neglecting some observations in which the dependent variables are partially known.

4.2.2 Tobit regression

Before conducting both tobit regression, histogram is performed first to know the upper and lower limit of outcome variable. As it results, the upper limit is 100 and lower limit is 0.

Tobit regression is conducted to know to what extent the explanatory variables significantly affect the firm's decisions to pay dividends. It is formulated as below,

$$DIV_{i,t} = \alpha_i + \beta 1 Pi_{i,t} + \beta 2 GROWTH_{i,t} + \beta 3 EARNEDCAP_{i,t} + \beta 4 SIZE_{i,t}$$
$$+ \beta 5 NICommon_{i,t} + \varepsilon_i$$

Table 4.4 analyses to what extent the determinants of dividend policy (profitability, growth opportunities, and mix of earned and contributed capital) affect the payout levels, proxied by dividend payout ratio (DPR). In addition, marginal effects are added to the tobit model, to know how the variables contribute to the level of dividend payouts.

From table 4.4, it can be deducted that all variables are statistically significant. In addition, there is 82,236 left-censored observations, 487,606 uncensored observations, 0 right-censored observations. The variables are also significant at 1 percent level.

Consistent with multiple linear regression model, profitability and mix of earned and contributed capital determine to what extent the firms are willing to pay dividend. Model 1, 2, 3, and 4 present similar results. As it can be deducted from the table, growth opportunities is significantly negative (-0.2244). Meaning that, the higher is the growth opportunities, the lower are the dividend pay-out ratio. On the other hand, from this finding, it can be deducted that increases in profitability and mix of earned and contributed capital contribute higher dividend pay-out ratio as the coefficients are 0.3245 and 0.0349 respectively. Furthermore, we can see that 1 percent increase in profitability and mix of earned and contributed capital, 0.278 and 0.030 percent increase of dividend payout ratio is expected accordingly. On the one hand, if growth opportunities increases by 1 percent, dividend payout ratio is expected to decrease by 0.192 percent.

Table 4.4 Tobit regression results

Independent Variables	Model 1		Model 2		Model 3		Model 4	
	Coefficient estimates	Marginal effects (%)	Coefficient estimates	Marginal effects (%)	Coefficient estimates	Marginal effects (%)	Coefficient estimates	Marginal effects (%)
Constant								
Pi	21.566 (581.09)						34.401	34.401
GROWTH			7.1923 (440.93)					
EARNEDCAP					19.883 (341.92)			
Pi	0.448 (154.30)	0.384					0.3245 (101.90)	0.278
GROWTH			-0.262 (-178.66)	-0.224			-0.2244 (-142.57)	-0.192
EARNEDCAP					0.086 (105.70)	0.074	0.0349 (38.36)	0.030
SIZE							-1.35e-09 (-47.23)	-1.155e-09
NICommon							1.98e-08 (56.88)	1.69e-08
No. of obs.	569,842		569,842		569,842		569,842	

	Model 1	Model 2	Model 3	Model 4
P-value				
Pi	0.0000			
GROWTH		0.0000		0.0000
EARNEDCAP			0.0000	
Pseudo R-squared				
Pi	0.0060			
GROWTH		0.0068		0.0130
EARNEDCAP			0.0026	
/sigma				
Pi	21.57	0.023		
GROWTH	21.13	0.022	20.963	
EARNEDCAP	21.52	0.023		

Model 1, 2, 3 represent univariate regression, model 4 represents multivariate regression

In conclusion, this finding is considered coherent compared to previous finding by Aldin and Al-Malkawi (2007) as they found that an increase in profitability affect the dividend payout by 0.167 percent. Despite the different measure of profitability employed by Aldin and Al-Malkawi in which earnings per share (EPS) was adopted instead of return on equity (ROE), yet this finding generates the similar result as prior findings.

In general, multiple linear regression and tobit regression generated similar results. Consistent with previous literature which proves that profitable firms tend to pay high dividend (Amidu and Abor, 2006). Negative coefficients of growth opportunities also imply that firms with high investment potentials would pursue very low dividend payout policy in order to retain funds to finance their investments (Abor and Bokpu, 2010). Also, the mix of earned and contributed capital plays important role to determine dividend payouts compared to profitability (De Angelo et al, 2005). However, results generated from multivariate analysis are considered more robust and reliable since it included size and net income available to common shareholders as control variables.

Determinants of dividend policy

The following section briefly summarizes the separate effects of each statistically significant factor that influences the firms' decisions to pay dividend in Nikkei 225, which is proxied by dummy variable, and to what extent the firms are willing to pay dividend.

Profitability

As it can be concluded from the tables previously, profitability positively significant in determining firms' decisions to pay dividend. The higher the profitability, the higher tendency of a firm to pay dividend. Furthermore, it is also contributing to what extent the firms willing to pay the dividends. The higher the profitability, the higher is the dividend pay-out ratio. It aligns with Jensen, Solberg, and Zorn (1992) that there is a positive relationship between profitability and dividends. These findings prove that profitability may have signaling implications for well performing firms in its capacity as an indicator of

future corporate performance (Dhanani, 2005). Therefore, the hypothesis is confirmed.

Growth opportunities

From the findings, it can be derived that growth opportunities negatively significant in determining firms' decisions to pay dividend. The higher the growth opportunities, the less likely of a firm to pay dividend. In addition, it also hinders to what extent the firms are willing to pay the dividends. The higher the growth opportunities, dividend pay-out ratio decreases. It is in line with Fama and French (2001) findings that dividend payers have poor growth opportunities, while firms that have never paid have higher growth opportunities. These findings also implicate that, rapid growth firms pursue a dividend retention strategy to retain funds for future investment (Dhanani, 2005). Therefore, the hypothesis is accepted.

Mix of earned and contributed capital

As it is shown in the table, it can be deducted that mix of earned and contributed capital positively significant in deciding firms' decisions to pay dividend. The higher the mix of earned and contributed capital, the more likely of a firm to pay dividend. It also escalates to what extent the firms are willing to pay the dividends. The higher the mix of earned and contributed capital, dividend pay-out ratio increases. Moreover, according to multivariate analysis on both models, mix of earned and contributed capital has greater effect in determining firms' decisions to pay dividends compared to profitability. It aligns with De Angelo et al (2005) findings. Therefore, the hypothesis is confirmed.

5. Conclusion

5.1. Data analysis

This paper analyses how profitability, growth opportunities, and mix of earned and contributed capital determine firms' decisions to pay dividends and to what extent dividends are paid in firms listed in Nikkei 225 within 2004-2016 period. Furthermore, linear probability model, logit regression, multi-linear regression, and tobit regression are performed in univariate and multi-variate analysis to examine whether the variables influence firms' decisions to pay dividend (in form of dividend per share) and dividend payout ratio. In this research, size (measured as market capitalization) and net income to common shareholders are employed as control variables

As the results of the econometrics model and regressions conducted, profitability, and mix of earned contributed capital have positive influence on firms' decisions to pay dividends (dividend per share as the proxy), and dividend payout ratio. The higher the value of profitability and mix of earned contributed capital, the firms are more likely to pay dividends with higher payout ratio. However, growth opportunities have contradictory outcome as it compared to the other variables. Firms are less likely to pay dividends with high growth opportunities. Moreover, firms with high growth opportunities are having low dividend payout ratio.

The results of this research are supported by findings from a study by Aldin and Al-Malkawi (2007) and Fama and French (2002). They found that profitability and mix of earned and contributed capital are also highly significant. Meaning that these variables are crucial determinants of firms' decisions to pay dividends and the level of dividends paid. Moreover, they also found that growth opportunities is significantly negative in determining firms' decisions to pay dividends and the ratio of dividends paid.

There are several possible explanations of these findings. First, profitability should be included in order to capture "real" differences among firms (Jensen et al, 1992), as profitability indicates firms' ability to pay dividend. Second, high growth opportunities firms are lack of free cash flows available, thus the funds are not allocated for dividend payments yet the funds will be recognised as investment. It is supported by free cash flow hypothesis, where

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managers spend cash for potential profitable projects instead of paying it out to shareholders (Jensen, 1986). Kato et al (2002) appears to find similar finding, as he concluded that free cash flow hypothesis holds in general population of Japanese firms. In addition, profitable firms with good investment opportunities may be forced to choose between dividend payments and capital expenditure. This may explain why high growth firms with strong investment opportunities pay low dividends (Myers and Majluf, 1984).

5.2 Limitations and further research

Besides all the empirical findings and supporting theories conveyed in this paper, few limitations still can be found. This paper merely captures the significant of profitability, growth opportunities, and mix of earned and contributed capital on dividend payments in Nikkei 225. Therefore, the findings cannot be generalised to other Eastern Asia regions. The explanatory variables employed in this research also cannot fully considered as main determinants of dividend policy. There are some possible factors which determine firms' dividend policy. These possible factors cannot be explained quantitatively and driven by political and socio-cultural factors. As it is found that dividend policy in several countries are different because they are affected by different financial factors (Ho, 2003). Moreover, the lack of knowledge about econometrics may be considered as constraints in this research.

Multiple questions are left over for further research. Firstly, how tax payments influenced by dividend payments could be investigated. Secondly, it would be more interesting to scrutinize dividend payments in Eastern Asia's indices, since these indices are rarely to be probed in most research paper.

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