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THE RELATIONSHIP BETWEEN DIVIDEND REPUTATION AND STOCK RETURNS: AN APPLICATION OF ORDERED LOGISTIC REGRESSION

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ABSTRACT

This study explores the improvement in dividend reputation of Taiwan's listed companies and analyzes the association between firm's dividend reputation and future stock returns. We employed listed companies adopting the dividend policy for five or seven consecutive years in Taiwan and maintaining or increasing dividend yield to define the building up of dividend reputation. Moreover, we examine the correlation between dividend reputation and expected stock returns. This study found out that Taiwan's mature listed companies with higher dividend yields and investment opportunities have significant correlation with firm dividend reputation. Meanwhile, listed companies that have paid non-decreasing dividends for at least five years significantly associated with higher and more stable firm stock returns than that of seven years paying non-decreasing dividends.

Keywords: Stock returns, Dividend reputation, Ordered logistic regression

1. Introduction

The relationship between dividend payout rate and stock returns is often the focus of public investors. Previous researchers studied this issue found various empirical results. For instance, Campbell and Shiller's (1988) suggested that dividend payout rate can forecast the stock returns. Recently, Golez (2014) declared that the dividend payout and stock returns exhibited a significant and positive relationship in the stock market. Conversely, Welch and Goyal (2008) did not find significant empirical results in using dividend payout to predict stock returns. Thus,

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further exploration is necessary to completely understand the relationship between dividend payout and stock returns.

In corporate governance, separation of control and ownership sometimes induces an agency problem. Crutchley and Hansen (1989) noted that firms paying dividend yields may reduce agency problems, if firm management and stockholders are separated. To solve agency problems, firms can pay dividends yields to the shareholders. Meanwhile, investors usually consider whether it is beneficial and profitable or not for firms to maintain normal dividend payments or increase dividend yield to build up dividend reputation to shareholders. Hence, the following questions need further study: does dividend reputation affect and raise firm's future stock returns? Do different empirical results exist in developed and emerging countries?

Currently, owing to the low interest rates in the capital market, people consider that capitals in the market must develop a way to increase profits. Particularly, in Taiwan's stock market, are specific firm stocks with good dividend reputation more stable and considered optimal and safe investments? Investors normally base this on the firm's dividend policy and consider that a firm remains the same dividend payout as of the previous year or increase dividend yield as the good investment objective in their judgment and perception. Therefore, dividend reputation seems to be critical for evaluating a firm. Moreover, firm top management focuses on corporate governance. Few studies have examined the dividend reputation issue in Taiwan's stock market. In this paper, we employed listed companies adopting the dividend policy for five or seven consecutive years in Taiwan and maintaining or increasing dividend yield to define the building up of dividend reputation. Moreover, we examine the correlation between dividend reputation and expected stock returns. Our empirical results are depicted as follows. We found out that Taiwan's mature listed companies with higher dividend yields and investment opportunities have significant correlation with firm dividend reputation. Meanwhile, listed companies that have paid non-decreasing dividends for at least five years significantly associated with higher and more stable firm stock returns than that of seven years paying non-decreasing dividends.

The remainder of this paper is organized as follows. Section 2 presents the methodology and data. Section 3 presents the empirical results. Finally, Section 4 concludes the study.

2. Methodology and Data

This study primarily estimated the correlation between the dividend reputation and stock returns of Taiwan's listed companies. We modified the dividend reputation model proposed by Kang, Kim and Oh (2019) and divided sampling companies into two groups: (1) companies paying non-decreasing dividends within five consecutive years and (2) companies paying non-

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decreasing dividends within seven consecutive years, individually. If in the same sampling period, the firm has paid decreasing dividends over one time (i.e., greater than or equal to one). This indicates that the firm cannot improve its dividend reputation. Usually, most investors expect to invest in the objective firm that paid dividends annually and also maintaining or increasing cash dividends until the next year. In this study, dividend reputation is defined according to investors' observations of company behaviors in previous dividend policy and their expectations on firms' ability to maintain stability in their business operations and provide non-decreasing dividend policies in next term. Thus, this study explores the improvement in dividend reputation of Taiwan's listed companies and analyzes the association between firm's dividend reputation and future stock returns.

Owing to Taiwan's enterprises regularly paying out dividends annually, the sampling period covers Q1 2010 to Q3 2019, specifically excluding periods such as the global financial crisis of 2007-2008 and the COVID-19 pandemic beginning in Q4 2019. This study mainly divided sampling companies into two groups to perform the estimation. For the first group–DRP5–dummy variable "1" indicates that the company paid non-decreasing dividends for at least five consecutive years; otherwise the dummy variable is "0." For the second group–DRP7–dummy variable "1" indicates that the company paid non-decreasing dividends for at least seven consecutive years; otherwise, the dummy variable is "0." Table 1 shows the data source and measurement information as follows.

Table 1 Data Definition and Measurement–Taiwan Listed Companies

Notation	Variable	Measurement	Source
$STR_{i,t}$	The Level of Company Stock Returns	Company stock returns of company i at period t	*TEJ*
$DRP5_{i,t}$	Dividend Reputation-5 years	Dummy variable is "1" if a firm continues to pay non-decreasing dividends for at least 5 years, and "0" otherwise	*TEJ*
$DRP7_{i,t}$	Dividend Reputation-7 years	Dummy variable is "1" if a firm continues to pay non-decreasing dividends for at least 7 years, and "0" otherwise	*TEJ*
$TBQ_{i,t-1}$	Lag one term of Tobin's Q ratio	Firm's investment opportunities (a figure of firm's market value divided by book value	*TEJ*
$DIVY_{i,t}$	Dividends	Natural log of dividends yield (cash	*TEJ*

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	yield	dividend divided by stock prices)	
$FS_{i,t}$	Foreign Stock Ownership	Foreign stock ownership	*TEJ*
$AGE_{i,t}$	Firm Maturity	Age of the Firms	*TEJ*

This study primarily examined correlation between dividend reputation and the expected stock returns of Taiwan's listed companies. We adopt dividend reputation (*DRP*) as the dependent variable. Independent variables include firm stock returns (*STR*), Tobin's *Q* ratio (*TBQ*), dividend yield (*DIVY*), foreign stock ownership (*FS*), and firm age (indicating firm's maturity) (*AGE*). These variables can perform the respective empirical estimations. With the relevant variables, Eqs.(1) and (2) formulate the empirical model as follows.

$$DRP5_{i,t} = \alpha_1 + \beta_1 STR_{i,t} + \beta_2 TBQ_{i,-1} + \beta_3 DIVY_{i,t-1} + \beta_4 FS_{i,t} + \beta_5 AGE_{i,t} + \mu_{i,t} \quad (1)$$

$$DRP7_{i,t} = \alpha_1 + \beta_1 STR_{i,t} + \beta_2 TBQ_{i,-1} + \beta_3 DIVY_{i,t-1} + \beta_4 FS_{i,t} + \beta_5 AGE_{i,t} + \mu_{i,t} \quad (2)$$

Dependent variables $DRP5_{i,t}$and $DRP7_{i,t}$represent the dividend reputation individually of a company *i* at period *t* , which utilize the dummy variable "1" to indicate if a firm continues to pay non-decreasing dividends for at least 5 or 7 years, and "0" if otherwise. Independent variables include five variables. $STR_{i,t}$indicates the stock returns of company *i* at period *t*. $TBQ_{i,t-1}$ indicates the lag one term of Tobin's *Q* ratio, which is calculated by the market value divided by book value, and represents investment opportunity and growth potential of company *i* in quarter *t*. $DIVY_{i,t}$represents the dividend yield of company *i*in quarter *t*, which is calculated by cash dividends divided by stock prices.$FS_{i,t}$represents foreign stock ownership of company *i*in quarter *t*.$AGE_{i,t}$ represents the firm maturity of company *i* at period *t*. $\mu_{i,t}$ is the disturbance term.

This paper employs two estimation methods – ordered logistic regression and linear regression − to compare their difference of two estimations. We sampled shares of Taiwan's listed companies, and the study period ranged from Q1 2010 to Q3 2019.The sample period excludes that of Q4 2019, which was the beginning of the COVID-19 pandemic. We expect to observe significant influence in the dividend reputation of Taiwan's listed companies. After removing incomplete and outlier data, 331 observations remained. Data werethen extracted from the *Taiwan Economic Journal*(TEJ) databank.

3. Empirical Results

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This study uses two estimation methods–ordered logistic regression and linear Regression–to observe their differences. Ordered logistic regression is used for estimation as the dependent variable–dividend reputation, is the dummy variable (binomial variables,–*DRP5* and *DRP7* individually); in contrast, and the independent variables are firm stock returns, Tobin's Q, dividend yield, stockholding of foreigners and firm age (maturity).

In this section, we present and discuss the estimation results of the regression equation shown in Eqs. (1) and (2). Tables2and 3 individually summarize the estimation results of ordered logistic regression and linear regression separately during the time interval Q1 2010 to Q3 2019.

Table 2 Estimation Results of Ordered Logistic Regression – Taiwan Listed Companies

Dependent Variable -	$DRP5_{i,t}$	$DRP7_{i,t}$
Explanatory Variable	***Coefficient***	***Coefficient***
$STKR_{i,t}$	0.2694***(4.54)	-0.0061(-1.81)
$TOBIN_{i,t-1}$	1.6292**(2.76)	2.1313***(6.04)
$DIVY_{i,t}$	0.4907(0.60)*	0.8248**(1.69)
$FS_{i,t}$	12.2723**(3.39)	9.3711***(4.05)
$AGE_{i,t}$	0.1233**(2.90)	0.0725***(4.933)
Observations	331	331
AdjustedR^2	0.6596	0.4569
Log-Likelihood	63.45***(0.000)	122.93***(0.000)
LR $x^2(5)$	245.91	206.85

Notes:Dependent variable is company dividend reputation of Taiwan's listed companies. Time period is Q1 2010 to Q3 2019. The figures in parentheses are *t*-statistics. *significant at 10% level; **significant at 5% level; ***significant at 1% level.

Table 3 Estimation Results of Linear Regression – Taiwan Listed Companies

Dependent Variable -	$DRP5_{i,t}$	$DRP7_{i,t}$
Explanatory Variable	***Coefficient***	***Coefficient***
Constant	-0.008	-0.258**

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	(-0.10)	(-2.79)
$STKR_{i,t}$	0.002***	-0.0013
	(5.73)	(-2.72)
$TOBIN_{i,t-1}$	0.210***	0.251***
	(0.027)	(8.37)
$DIVY_{i,t}$	0.033*	0.124*
	(0.49)	(1.68)
$FS_{i,t}$	0.003	0.038**
	(0.34)	(3.05)
$AGE_{i,t}$	0.007***	0.0132**
	(4.14)	(6.89)
Observations	331	331
$AdjustedR^2$	0.3597	0.3969
F-statistic	38.07***(0.000)	44.43***(0.000)
Root MSE	0.3473	0.3852

Notes:Dependent variable is company dividend reputation of Taiwan Listed companies. Time period is Q1 2010 to Q3 2019. The figures in parentheses are *t*-statistics. *significant at 10% level; **significant at 5% level; ***significant at 1% level.

In Table 2, the estimation results of ordered logistic regression, we discovered that for both two groups–DRP5 and DRP7–the variables of dividend yield (*DIVY*) and maturity (*AGE*) both have significant and positive influence on dividend reputation. Basically, when listed firms have more profits and maturity, they are likely to pay non-decreasing dividends streams to the investors. In Taiwan's stock market, not many companies pay consecutive dividend yields. If listed firms continue to pay the same or higher dividend yields than that of the previous year, this establishes good dividend reputation in investors' minds. Based on the firm's maturity and operational performance, public investors expect that Taiwan's listed companies may express continued stable dividends and profitability as their investment objectives. Additionally, when we observed the coefficient of two groups (DRP5, DRP7), we found that the coefficient of dividend yield (*DIVY*), DRP7 is higher than that of DRP5 (0.8248 > 0.4907). Therefore, listed firms with seven consecutive years non-decreasing dividends may provide higher dividend yields than firms with five consecutive years of non-decreasing dividends.

However, on the variable of firm stock returns, DRP7 is not as significant as DRP5. We found that in the impact of stock returns on dividend reputation, DRP5 has a significant and positive impact on stock returns, but DRP7 is insignificant. Meanwhile, the coefficient of DRP5 is evidently higher than that of DRP7 (0.2694 > -0.0061 in OLR estimation and 0.002>-0.0013 in

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LR estimation). Hence, firms with five consecutive years of non-decreasing dividends have much higher expected stock returns than those of firms with seven consecutive years. Firm stock return prices fluctuate and cannot remain in an increasing trend. We can see in stock returns, Taiwanese listed firms' dividend payouts in five consecutive years have the most significant and positive effects than that of seven consecutive years. This may be attributable to the longer time period of seven years. Additionally, firms paying continuous non-decreasing dividend streams over a longer time horizon such as seven years (DRP7) probably experience a slowdown in stock returns. Therefore, we can see that firms with five consecutive years of non-decreasing dividends (DRP5) may considered optimal investment objectives in investment portfolio for the investors. DRP5, whether in stock returns, dividend yield, investment opportunities, and foreign stockholding, all exhibit a significantly positive outlook and higher profitability and, hence, improve dividend reputation.

Additionally, in Table 3, we use linear regression to estimate the two groups (DRP5, DRP7), and the estimation results confirm the similar empirical results in using ordered logistic regression in Table 2. Both estimations express that when listed companies own a higher dividend yield (*DIVY*), more mature (*AGE*) and profitable (*TOBIN*'S) companies can create – good dividend reputation. Meanwhile, in stockholding of foreigners, firms with five consecutive years of non-decreasing dividend payout (DRP5) exhibits a significant and positive influence. This shows that listed firms with more stockholding by foreigners will achieve good dividend reputation.

In the Tobin's Q, both estimation methods exhibit significant positive effects on dividend reputation. Hence, firms with greater investment opportunities tend to continuingly pay non-decreasing dividend, and both DRP5 and DRP7 groups have the same effects. This is expressed in Taiwanese listed companies as when firms have higher Tobin's Q (market-to-book ratios), they generally have better investment opportunities and require capitals from external providers. Therefore, listed firms may transmit this information to external investors through their dividend payout policy and good dividend reputation. In this variable of Tobin's Q, the estimation results of two methods–ordered logistic regression and linear regression–are similar. Additionally, the two estimation methods (OLR and LR) express that listed firm with seven consecutive years non-decreasing dividend payout has higher coefficient than that of five years non-decreasing dividend. This indicates that firms with seven consecutive years non-decreasing dividend group (DRP7) need to maintain good dividend reputation and use dividend payout policy to attract external capitalists to invest.

The variable of age indicating firm maturity exhibits a significant positive influence. This shows that older firms are more mature and can better improve their dividend reputation and may even

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pay stable non-decreasing dividends. We can see that older, larger, and less risky firms are associated with less asymmetric information in their own dividend reputation. On the proportion of stock held by foreign investors, listed firms own relatively higher foreign stockholdings, and they will not decide to decrease dividend payouts easily in the continuing years.

4. Conclusion

Presently, owing to the low interest rates in Taiwan's capital market, the public investors tend to find a solution to make capitals more profitable and flexible. Potential investors - consider the aspects of dividend payout policy and dividend reputation. To payout dividend yield for the firm is also a solution to reduce agency costs in increasing the flexibility of top management. Compared with the foreign developed countries as Europe and USA, the improvement of dividend reputation and dividend payout policy of Taiwan firms needs further study and analysis. In this paper, we attempt to study the issue of firm dividend reputation in Taiwan's stock market. Meanwhile, the investors tend to focus on the dynamic situation in Taiwan's stock market, and consider the related important factors for choosing the stable investment objectives as their investment portfolio. Two groups–DRP5 and DRP7–are employed for studying the dividend payout policy of Taiwanese listed firms and see their estimation differences.

Our empirical results show that Taiwanese listed firms with higher dividend yields, mature, and higher investment opportunities significantly correlated with firm's building up dividend reputation. Listed firms with at least five years of paying consecutive non-decreasing dividends (DRP5) have more significant association with stock returns than that of seven years (DRP7). When firm's top management decides their dividend payout policy every year, they must consider the consecutive non-decreasing dividend payout policy to maintain good dividend reputation and further attract their capitals providers inside and outside the country. Meanwhile, in corporate governance, Core, Guay, and Rusticus (2006) noted that all investors consider that weak governance will induce to poor operating performance, which will quickly influence firm's stock prices, thus leading to poor subsequent stock returns. Hence, when investors make their investment decisions, they will concentrate on firms with dividend reputation and those paying out non-decreasing dividend policies. They are likely to select them as investment objectives in their optimal investment portfolio. Therefore, our results may provide important reference and decision recommendations for public investors and top management.

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