“Dividend payout ratios and subsequent earnings growth: evidence from Taiwanese stock-listing companies”

AUTHORS	Chin-Sheng Huang Chun-Fan You Szu-Hsien Lin

ARTICLE INFO	Chin-Sheng Huang, Chun-Fan You and Szu-Hsien Lin (2009). Dividend payout ratios and subsequent earnings growth: evidence from Taiwanese stock-listing companies. *Investment Management and Financial Innovations*, *6*(2)
RELEASED ON	Tuesday, 19 May 2009
JOURNAL	"Investment Management and Financial Innovations"
FOUNDER	LLC “Consulting Publishing Company “Business Perspectives”

NUMBER OF REFERENCES **0**

NUMBER OF FIGURES **0**

NUMBER OF TABLES **0**

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Chin-Sheng Huang (Taiwan), Chun-Fan You (Taiwan), Szu-Hsien Lin (Taiwan)

Dividend payout ratios and subsequent earnings growth: evidence from Taiwanese stock-listing companies

Abstract

This study examines companies paying dual dividends and discusses whether high dividend payout ratios are associated with subsequent earnings growth. Conventional wisdom suggests that, in practice, high cash dividends reduce retained earnings, whilst high stock dividends effectively dilute subsequent earnings; thus, both are assumed to count against the future earnings growth of a company. In this study, however, we find that high payout ratios have a positive association with earnings growth, with such a pattern also applying to future returns. Finally, after running tests for robustness, and using earnings mean reversion and share repurchases, we obtain similar results.

Keywords: dual dividend, dividend payout, subsequent earnings growth, future returns.
JEL Classification: G35.

Introduction

For some considerable time, conventional wisdom, supported by a variety of academic studies, has assumed that high dividend payout ratios would directly affect investment plans and ultimately prove to be detrimental to future earnings growth[1]. However, this supposition has recently been challenged by Arnott and Asness (2003). Using the S&P 500 as a proxy variable for market portfolio, they examined the relationship between the aggregate dividend payout ratio of the market and future earnings growth; and indeed, they found that the association was positive.

In an attempt to determine whether high dividend payout ratios were linked to strong earnings growth, Ap Gwilym et al. (2006) analyzed 11 industrialized nations, including the US and Japan, and found that their results corroborated the contention of Arnott and Asness (2003). Using 1950-2003 financial data on companies in the US to undertake a similar study at company level, Zhou and Ruland (2006) also confirmed that high dividend payout ratios were subsequently followed by high earnings growth.

Further analysis of the findings of the latter study also showed that this phenomenon remained unchanged even under alternative measures of payout and earnings, sample composition, mean reversion in earnings, the effects of particular industries, time periods, and share repurchases. Zhou and Ruland (2006) concluded that a possible reason for this was to be found in the free cash flow hypothesis; that is, that high dividend payouts would reduce agency costs and curb over-investment, thereby creating a favorable environment for future earnings growth.

This study extends the procedures adopted by Zhou and Ruland (2006), including dual dividends, along with both cash and stock dividends, in an attempt to determine the robustness of their results. The payment of dual dividends is quite a unique characteristic of Taiwanese stock-listing companies, and indeed, there are inherent differences, in terms of their implications, between the stock-dividend accounting practices adopted in Taiwan as compared to those adopted in the US.

In accordance with the published accounting principles within the US, firms paying stock dividends of less than 20 per cent (referred to as 'small-denomination' stock dividends) are required to transfer the stock dividend funds from their retained earnings and to issue new shares based upon the market price[2]. Such measures have essentially led to the disappearance of these small-denomination stock dividends which were extremely popular throughout the 1920s and 1930s (Zeff, 1982). As a result, the stock dividends issued 'at par' (at levels of 25 per cent or above), which subsequently emerged, became referred to as 'large-denomination' stock dividends[3]. In terms of their accounting treatment, these new shares could be funded by means of capital surplus, by

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[1] Conventional wisdom generally regards abundant retained earnings as reflecting wide opportunities for investment; however, in practice, a high-dividend policy will invariably hinder a firm's efforts to increase its retained earnings. Indeed, a similar view is apparent in the fixed dividend growth model of Gordon (1962), in which it was hypothesized that a high-dividend payout would weaken future earnings, whilst the 'pecking order' theory of Myers (1984) also stated that high-growth companies would prefer to use internally generated cash to meet future investment demand. This therefore implies that such companies would strive to maintain lower dividend payout ratios.

[2] See AICPA (1953, Ch. 7B, par.10); and SEC (1972).

[3] As regards their distribution of stock dividends in the form of new shares between 20 and 25 per cent, although managers do have some discretion with regard to the issuing of the shares at the market price, or at par, they usually prefer to treat the shares as large-denomination stock dividends. Rankine and Stice (1997) demonstrate that in order to avoid the relatively large market value transfer from retained earnings, almost half of the firms declaring a 20 per cent stock dividend used a loophole in the accounting rules to classify such distributions as 'large'.

retained earnings, or by a combination of both. Firms could also choose to undertake a pure stock split in order to increase their overall shares, a process which would result in no direct impact on any accounting items.

In contrast, listed companies in Taiwan are still able to distribute regular stock dividends at par in the form of either capital surplus, or current post-tax earnings, or a combination of both[1]; hence, the practice of stock splitting, which is extremely popular in the US, does not actually exist in Taiwan. From the perspective of a reduction in retained earnings, the regular distribution of dual dividends in Taiwan is conceptually similar to the distribution of total dividends, as adopted in the US. More importantly, the procedure of calibrating payout ratios in terms of total dividends is a necessary element of any empirical examination (Allen and Michaely, 2003; Zhou and Ruland, 2006; Skinner, 2008).

The dividend distribution policy adopted in Taiwan is indeed quite a unique practice in a global sense, but one which is nevertheless very common throughout Taiwanese stock-listing firms. Prior to 1998, firms in Taiwan had grown accustomed to paying stock dividends, with hardly any firms at all paying cash dividends. Given the extremely high market growth rates that were achieved during the period prior to 1998, the potential problem of diluting the EPS of a firm through this stock dividend policy had essentially been alleviated at that time. However, in 1998, the Taiwanese government brought into effect a new tax law which imposed a 10 per cent levy on retained earnings. As a result of this levy, Taiwanese companies were confronted with a number of choices for their optimal dividend payout process.

Companies therefore had to decide whether the distribution of the firm's earnings would take place in the form of cash dividends, stock dividends, or a combination of both[2]. Given that the companies in the traditional industries were generally more mature, they would often elect to pay cash dividends or a mixture of large cash dividends and small stock dividends. In contrast, small firms (or those in the rapidly growing electronics industry) would usually elect to pay stock dividends, or a mixture of small cash dividends and large stock dividends.

In the period of sluggish economic growth which Taiwan was subsequently subjected to, the preference of investors and other issues relating to cash payouts may have led to a shift in the traditional position on dividend policy, from the original emphasis on stock dividends towards greater emphasis on cash dividends[3]. Thus, we observe that a significant number of firms in our sample have resorted to paying cash dividends since 2000, with dual dividends contributing as much as 75.3 per cent of the total dividends between 2000 and 2004[4].

In the context of Taiwanese stock-listing companies, the usual adoption of cash dividend payout ratios within the literature provides little meaning to the analysis of Zhou and Ruland (2006). Therefore, prior to investigating whether high payout ratios do in fact convey new information about future earnings growth in Taiwan, we must estimate the whole set of dividend payout ratios, particularly those involving dual dividends (both cash and stock dividends) in the same fiscal year.

Nevertheless, in consideration of these problems, as opposed to simply focusing on cash dividends, in this study we extend the procedures adopted by Zhou and Ruland (2006), expanding our research to

[1] Basically, stock dividends do not, in essence, increase in value, but instead, merely indicate a rearrangement of the composition of the owners' equity accounts; that is, with regard to their accounting practices when dealing with the balance sheet, the various firms will merely tend to transfer either their capital surplus or their retained earnings to common capital stock, or to engage in a combination of both. The adoption of a stock dividend policy can apparently help to maintain internal cash levels, thereby enabling a firm to meet its future demand for investment. In contrast, the main effect of the payment of cash dividends will be a reduction in retained earnings, although other effects may also include a reduction in asset accounts in the balance sheet, along with a corresponding increase in debt accounts.

[2] In Taiwan, the highest corporate tax is 25 per cent and the highest individual income tax is 40 per cent. From 1988 onwards, if a company chose to retain all of its current post-tax earnings, the real corporate tax would be increased to a maximum of 32.5 per cent. According to the tax law in Taiwan, individual income tax can be partially offset by the corporate tax already levied; however, if the marginal individual tax of the key stockholders is higher than their marginal corporate tax, since capital gains are free of tax in Taiwan, they would prefer to have a lower proportion of cash dividends and a higher proportion of current earnings.

[3] For example, there are two competing views surrounding the issue of concentration of proprietorship and management on dividend payout policy. Rozeff (1982) found that in a sample of 1,000 US firms, higher dividend payouts were established when insiders held a lower proportion of the equity and/or a greater number of stockholders owned the outside equity. In contrast, Faccio et al. (2001) showed that with tightly controlled groups, particularly those exhibiting wider discrepancies between ownership and control, investors appear to be alert to the greater exposure to expropriation. Thus, the group-affiliated corporations in Western Europe will generally tend to pay higher dividends than those groups which are more loosely affiliated. We analyze this issue in Taiwan by regressing the payout ratios on the concentration index of ownership. The regression results are consistent with the viewpoint of Faccio et al. (2001), at the 1% level of significance, with regard to their confirmation of the existence of a positive linear relationship between such concentration of ownership and the firms' payout ratios.

[4] There has been a significant increase in the US, since the 1980s, in share repurchases as a form of earnings distribution. For example, in 2004, the total amount of share repurchases exceeded that of cash dividends (Skinner, 2008); according to Skinner, dividend payouts can be divided into five types, which are cash dividends only, cash dividends and routine share repurchases, routine share repurchases only, occasional share repurchases only, and no dividends. Of these types, the cash dividends and routine share repurchases contributed as much as 61.6 per cent of the total dividend payouts in the 1995-2004 period.

include dual dividends, along with cash and stock dividends, at company level. From our pooled cross-sectional data on Taiwan, we find that the high dividend payout ratio for the dual-dividend sample is roughly equivalent to the subsequent high rate of growth in earnings; favorable evidence is also found with regard to the cash-dividend sample. However, such an association is revealed only in the low payout group of the stock-dividend sample.

The remainder of this paper is organized as follows. Details of the data and a description of the dividend sample are provided in section 1, followed in section 2 by presentation of the study design, along with an explanation of the regression model for dividend payout ratios and the related variables. Analysis of the empirical results is undertaken in section 3, with the tests for robustness subsequently being presented in section 4. Finally, the conclusions drawn from this study are presented in the last section.

1. Data and methodology

We obtained the data for this study from the database of the Taiwan Economic Journal (TEJ)[1]. Given that the number of companies in Taiwan issuing cash dividends has increased substantially since 2000, and that government regulations allowing companies to buy back shares as treasury stocks came into effect in that same year, the sample period for this study is set as 2000 to 2004[2]. Furthermore, in order to assist in the calculation of current and future earnings growth, analysis of additional data was also undertaken on the years 1999 and 2005.

The criteria for data screening were: (i) companies to be included in the sample should be listed on either the Taiwan Stock Exchange (TSE) or the Taiwan 'over the counter' (OTC) market; the inclusion of both markets was not only for the purpose of producing a bigger sample size, but also to facilitate a comparison of the differences between the two markets; (ii) only firms in the non-financial industries were to be included in the sample; firms in the financial industry would be excluded essentially because their financial structure differs from that of other industries; (iii) companies with incomplete financial data, preferred shares or TDR would also be excluded from the sample; (iv) companies must have positive earnings in the year under examination, and have dividend payout ratios of less than 1; and (v) the top and bottom 1 per cent of all observations would be discarded so as to avoid the effects of outliers. Table 1 describes the distribution of the sample based upon the selection criteria outlined above.

Table 1. Sample distribution of dividend payout ratios

		Cash dividends		Stock dividends		Dual dividends		Others*	
		No.	%	No.	%	No.	%	No.	%
2000	746	43	5.76	58	7.77	134	17.96	511	68.50
2001	867	77	8.88	45	5.19	124	14.30	621	71.63
2002	969	113	11.66	28	2.89	218	22.50	610	62.95
2003	1,058	114	10.78	42	3.97	313	29.58	589	55.67
2004	1,135	150	13.22	30	2.64	411	36.21	544	47.93
Total	4,775	497	10.41	203	4.25	1,200	25.13	2,875	60.21

Note: * The term 'others' refers to those observations where no dividends are paid, where there are negative earnings, or where the ratio of the dividend payout for the year was greater than 1.

Throughout the five-year period, the cash-dividend sample (those paying only cash dividends) comprised of a total of 497 firms, the stock-dividend sample (those paying only stock dividends) comprised of 203 firms, and the dual-dividend sample (those paying both cash and stock dividends) comprised of 1,200 firms. In 2000, a total of 43 firms paid cash dividends, 58 paid stock dividends and 134 paid dual dividends; by 2004, the respective figures had changed to 150, 30 and 411.

Of these statistics, the most notable is the reduction in the number of firms paying only stock dividends, as compared to the increase in the numbers of firms using the other dividend payment methods. It should be noted that within each industry in Taiwan, most of the leading companies pay dual dividends; hence the cash-dividend sample in this study is relatively small, which is quite different from other markets. In the US, for instance, the firms paying the largest cash dividends, as pointed out by DeAngelo et al. (2004), account for a majority of aggregate dividends in the market. A similar situation is also discernible with regard to the comparative share of cash dividends to total dividends.

[1] The TEJ Taiwan Database is one of the main resources in Taiwan from which many researchers extract their financial data.

[2] Cash dividend payouts within the sample were extremely scant during the period from 1995 to 1999, amounting to a total of only 49 observations at an average of less than ten payouts per year. Thus, based upon the lack of availability of data, we were only able to set the years 2000 to 2004 as our research study period.

The comparative shares of all dividend payouts are presented in Table 2, from which we can see that the overall share of cash-dividend payouts for the five-year period was only 10.29 per cent, whereas the cash dividend element of the dual-dividend sample accounted for a massive 47.10 per cent. Furthermore, there does not appear to be any obvious growth in the share of solely cash-dividend payouts; as we can see, the share of cash-dividend payouts was 11.2 per cent in 2003 and 11.18 per cent in 2004. In contrast, the cash dividend element of the dual-dividend sample had continued to grow to 51.16 per cent by 2003, and climbing still further to 58.12 per cent in 2004. It is therefore clear that dual-dividend payouts far exceed cash-dividend payouts in terms of the comparative share of dividend payouts.

Table 2. Proportions of dividend payouts, by different types of dividends*

Year	Cash dividends	Stock dividends	Dual dividends			Share repurchases
			Total	Cash	Stock	
2000	3.35	35.61	55.71	24.42	31.29	5.33
2001	15.33	6.06	63.34	29.46	33.88	15.27
2002	10.98	10.21	74.11	46.55	27.56	4.70
2003	11.20	5.15	79.61	51.16	28.45	4.04
2004	11.18	0.99	83.80	58.12	25.68	4.03
2000-2004	10.29	9.14	75.28	47.10	28.18	5.29

Note: * All figures are in percentage terms.

We also included the sample of outliers with abnormal payout ratios in a rerun of the regression models. The first thing that we note is that although the additional observations on abnormal payout ratios raise the original sample from 1,900 to a total of 2,393, the new sample nevertheless demonstrates a rather distinct result whereby high payout ratios exhibit no positive association with earnings growth for any type of dividend samples. This therefore implies that the exclusion of the abnormal payout ratios is a necessary condition for the validation of the assertions of Zhou and Ruland (2006).

Although this finding suggests that our main results are sensitive to the discarded outliers, we prefer to see this as evidence that the inclusion of abnormal outliers seriously destroys the true relationship underlying the payout ratios and future earnings growth. After all, it is clear that when companies experience negative earnings, the operational definition of dividend payout ratios would, in fact, become meaningless. Furthermore, it is also clear that companies would not generally pay out dividends that exceeded their earnings. A similar view can also be found in Zhou and Ruland (2006).

As regards the data on financial firms, a surge in the number of financial holding companies became evident in Taiwan in 2001 as a result of mergers and acquisitions between the various financial institutions. Thereafter, there were only very few financial firms within which their individual identity and independent financial data remained intact. The discarding of data on financial firms has therefore become common practice in Taiwanese studies on corporate finance. Although these financial firms constitute quite a trivial proportion of the entire sample, we nevertheless decided to conduct the related test for robustness and found that the empirical results of this test were in line with our expectations and that they did not affect the main findings of our study.

Since the sample selection problem in Zhou and Ruland (2006) was regarded as negligible, thereby justifying their use of the OLS approach, we have followed the procedures adopted by Zhou and Ruland in the present study, using OLS estimations to assess the association between dividend payout ratios and future earnings growth.

2. Study design

This study follows the procedures reported in Zhou and Ruland (2006) to assess the association between dividend payout ratios and future earnings growth; however, in order to effectively measure the dividend payout ratios of companies in Taiwan, it is necessary to substitute some variables in our model[1]. The modified model is therefore as follows[2]:

[1] As in the model of Zhou and Ruland (2006), this study uses first quarter ROA for year $t+1$ (ROA_t^e), the index of the market risk ($Beta_t$), and dividend yield ($DivYield_t$) as respective substitutes for the return on assets (ROA), earnings yield (E/P) and financial leverage (LEV). We also use $Size_t$ to denote the natural logarithm of the book value of assets, rather than the equity value.

[2] As pointed by an anonymous referee, the specification of model (1) may cause a potential endogeneity problem. To clarify this issue, after conducting the Granger Causality Test, the evidence indicates that ROA_t^e does not Granger Cause $EPSGR_{t+1}$, and that $EPSGR_{t+1}$ does not Granger Cause ROA_t^e. Hence, we can conclude that the control variable ROA_t^e does not give rise to any potential problem of endogeneity. Furthermore, the results of our additional examination of the Granger causality of *Cash payout ratios* and $EPSGR_{t+1}$ again preclude any potential endogeneity. The same result is also obtained from the examination of *Stock payout ratios* and *Dual payout ratios*.

$$EPSGR_{t+1} = \alpha_0 + \beta_1 Payout_t + \beta_2 Size_t +$$
$$+ \beta_3 ROA_t^e + \beta_4 Beta_t + \beta_5 AG_{t+1} +$$
$$+ \beta_6 DivYield_t + \beta_7 EPSGR_t + \varepsilon_t, \quad (1)$$

where $EPSGR_{t+1}$ is future earnings growth, measured as the growth in annual post-tax earnings of common shares from year t to year $t+1$; $Payout_t$ is the dividend payout ratio, measured as the dividend for year t divided by current earnings for year t; $Size_t$ refers to firm size, measured as the natural logarithm of the total assets at the end of year t; ROA_t^e is the prediction of the return on assets for year $t+1$, proxied by the first quarter earnings for year $t+1$ divided by the total assets for that quarter; $Beta_t$ is the index of market risk (that is, the beta for an individual company) in year t; AG_{t+1} is future asset growth, measured as the annual growth in total assets from year t to year $t+1$; $DivYield_t$ is the dividend yield (current dividend divided by the stock price) at the end of year t; $EPSGR_t$ is current earnings growth, measured as annual post-tax earnings growth for common shares from year $t-1$ to year t.

Earnings per share (*EPS*), return on assets (*ROA*) and return on equity (*ROE*) are often used for the measurement of future earnings; of these, *EPS* is the most familiar to investors. Thus, in this study, we give priority to *EPS*, but also adopt *ROA* and *ROE* to test for robustness. The key independent variable in this study is the 'dividend payout ratio' which is classified into three types: cash-dividend payouts (cash dividend divided by post-tax earnings), stock-dividend payouts (stock dividend divided by post-tax earnings) and dual-dividend payouts (the sum of cash and stock dividends divided by post-tax earnings). If the association between dividend payout ratios and future earnings growth conforms to conventional wisdom, the coefficient on dividend payout ratio will be negative; otherwise, support will be provided for the results of Zhou and Ruland (2006)[1].

As regards firm size, the findings of DeAngelo et al. (2004) indicated that the influence of firm size was significant in those cases where listed companies paid cash dividends; that is to say that the dividend payouts of larger-sized firms will tend to be in larger amounts. However, the capital stocks of these companies are much greater than those of small companies, such that their larger firm size will be detrimental to future earnings growth. Therefore, in this study, we also use firm size as a control variable, and expect to find that it has a negative association with future earnings growth.

Earlier research by Lintner (1956) suggested that managers, in determining the level of dividend payouts, would consider not only current earnings and lagged earnings, but also the potential changes in future earnings. In Taiwan, for instance, the timing of the announcement of dividends is roughly at the beginning of, or shortly after, the second season of the next period, a point at which the profits of the first season will have been realized. Thus, the announcements made are usually interpreted as a signal to investors of future earnings. In light of this, in this study, we use *ROA* in the first season of the second year as a control variable, and expect to find that the coefficients in the regression are positive.

It is already widely recognized that firms with low betas are not easily affected by external environments, which also reveals their distinctive features; i.e., the stronger this factor is, the greater is the acceptability of their products or services to the markets. Following this argument, we introduce beta into the model as a control variable and expect to see companies with low betas also having higher earnings growth.

Generally speaking, with growth in a company's earnings, there will be a corresponding rapid increase in its cash flow, with the most obvious factor being the increase in accounts receivables on the balance sheet; these effects could, however, be dispersed amongst various assets or may also come in the form of a reduction in debts. On the whole, assets benefit most from growth in earnings; or, to put it another way, the main contributor to an increase in assets is growth in earnings, if the increase is not funded by issuing new shares or raising debts. In consideration of this, *ceteris paribus*, we expect to find that the association between future asset growth and earnings growth would be positive.

It may well be that the intuition amongst market observers is that institutional investors and gray-haired individual investors would prefer to invest in stocks with low volatility and high-dividend yields. Nevertheless, according to the findings of Graham and Kumar (2007), those who prefer stocks with high-dividend yields are mostly elderly investors on low incomes, whereas in contrast, those stocks with

[1] As pointed out by an anonymous referee, there is a potential self-select problem in terms of the payout mechanism. In order to address above issue, an examination of the summary statistics of $EPSGR_t$ shows that the sample mean of the cash dividend sample is 0.389 whilst that of the stock dividend sample is 1.067. We further investigate the mean difference in $EPSGR_t$ between these two samples by carrying out a *t*-test with unequal variance. The empirical test indicates that there are no significant differences in $EPSGR_t$ between the cash dividend sample and the stock dividend sample. Interestingly, however, this result would seem to imply that those companies which issue more cash dividends do not tend to perform any better in the same fiscal year than those issuing more stock dividends.

low-dividend yields seem to be preferred by institutional investors and young people. By extension, if we assume that institutional investors perform better than individual investors, we can also expect to see dividend yields having a negative association with future earnings growth. To ensure congruence with the different types of dividend payouts, we divided the data on dividend yield into three groups, cash-dividend yield (cash dividend divided by year-end stock prices), stock-dividend yield (stock dividends divided by year-end stock prices) and dual-dividend yield (the sum of cash and stock dividends divided by year-end stock prices).

Finally, since future earnings growth may exhibit mean reversion in the Model (1) regression, we introduce current earnings growth as a control variable, so as to mitigate any potential bias caused by the omission of certain variables. We hypothesize that the coefficient on current earnings growth will be negative.

The descriptive statistics of the key variables are provided in Table 3, which shows that during the five-year period under examination, the mean dividend payout ratios were 0.715 for companies making cash payouts, 0.707 for companies making stock payouts, and 0.731 for companies making dual dividend payouts. As for future earnings growth, the smallest mean (-0.483) is found in the stock-dividend sample, whilst the largest mean (-0.034) is found in the cash dividend sample.

Table 3. Summary statistics

Type of dividend [a]	Main variable [b]	25%	Mean	Median	75%	S.D.	No. of obs.
Cash	$EPSGR_{t+1}$	−0.329	−0.034	0.013	0.386	1.729	497
	$Payout_t$	0.625	0.715	0.741	0.837	0.161	
Stock	$EPSGR_{t+1}$	−0.905	−0.483	−0.300	0.323	1.884	203
	$Payout_t$	0.588	0.707	0.748	0.833	0.174	
Dual	$EPSGR_{t+1}$	−0.412	−0.102	−0.090	0.207	0.762	1,200
	$Payout_t$	0.648	0.731	0.747	0.837	0.145	

Notes: [a] The three types of dividend payouts are (i) cash dividend payouts (cash dividend divided by post-tax earnings); (ii) stock dividend payouts (stock dividend divided by post-tax earnings); and (iii) dual dividend payouts (the sum of cash dividends and stock dividends divided by post-tax earnings). [b] $EPSGR_{t+1}$ denotes future earnings growth; $Payout_t$ denotes the ratio of dividend payouts.

We find that the sample means of only two variables in the stock-dividend sample revealed low values, whilst those of the remaining variables were indeterminate. Accordingly, we do not expect to see the hypothesis of a high dividend payout ratio being associated with subsequent high earnings growth holding for the stock-dividend sample. We can now go on to discuss which type of dividend payout would reproduce the results reported by Zhou and Ruland (2006).

In order to address the potential problem of multicollinearity in our regression analysis, a correlation matrix table (Table 4) has been added to the paper showing the correlations between the variables. As the table shows, all of the correlation coefficients are well below 0.4, with the notable exceptions of ROA_t^e and $EPSGR_{t+1}$ (0.4649) in the stock dividend sample (Panel B) and ROA_t^e and *Dividend yield* (0.4504) in the dual dividend sample (Panel C). However, the regression results show that the VIF factors are below 2 for all of the variables; hence, we can reasonably assume that the regression analysis is not unfavorably subjected to the problem of multicollinearity.

Table 4. Variable correlation matrix*

Variables	$EPSGR_{t+1}$	$Payout_t$	$Size_t$	ROA_t^e	$Beta_t$	AG_{t+1}	$DivYield_t$	$EPSGR_t$
Panel A. Cash dividend samples								
$EPSGR_{t+1}$	1.0000	0.0838	0.0256	0.3733	−0.0593	0.3826	−0.0607	0.0180
$Payout_t$		1.0000	−0.1074	0.0327	−0.2104	−0.0442	0.2147	−0.0426
$Size_t$			1.0000	0.0619	0.3648	−0.0720	−0.0045	−0.0658
ROA_t^e				1.0000	−0.0536	0.2012	0.2009	0.0047
$Beta_t$					1.0000	−0.0383	−0.1186	−0.0751
AG_{t+1}						1.0000	−0.1464	0.0455
$DivYield_t$							1.0000	0.0592
$EPSGR_t$								1.0000

Table 4 (cont.). Variable correlation matrix*

Variables	$EPSGR_{t+1}$	$Payout_t$	$Size_t$	ROA_t^e	$Beta_t$	AG_{t+1}	$DivYield_t$	$EPSGR_t$
Panel B. Stock dividend samples								
$EPSGR_{t+1}$	1.0000	0.0106	−0.0342	0.4649	−0.0796	0.2621	0.0601	0.0386
$Payout_t$		1.0000	−0.1448	0.0250	−0.0238	−0.1406	0.1610	−0.1101
$Size_t$			1.0000	−0.0900	0.4101	−0.0836	0.0799	−0.0186
ROA_t^e				1.0000	−0.0798	0.3057	0.3969	−0.0037
$Beta_t$					1.0000	−0.0093	0.0869	0.0213
AG_{t+1}						1.0000	0.1820	0.3547
$DivYield_t$							1.0000	−0.0330
$EPSGR_t$								1.0000
Panel C. Dual dividend samples								
$EPSGR_{t+1}$	1.0000	0.1023	−0.0205	0.2763	−0.0887	0.3264	−0.1110	−0.0341
$Payout_t$		1.0000	−0.1336	0.0261	−0.1456	−0.1010	0.0362	−0.0592
$Size_t$			1.0000	−0.0090	0.3613	−0.0384	−0.0224	0.0280
ROA_t^e				1.0000	−0.0537	0.3436	0.4504	0.0038
$Beta_t$					1.0000	0.1188	0.1236	0.0770
AG_{t+1}						1.0000	0.2775	−0.0134
$DivYield_t$							1.0000	−0.0002
$EPSGR_t$								1.0000

Notes: * The dependent variable $EPSGR_{t+1}$ refers to future earnings growth; $Payout_t$ denotes the ratio of dividend payouts (cash dividends divided by post-tax earnings); $Size_t$ is firm size; ROA_t^e refers to the first quarter asset returns in year $t+1$; $Beta_t$ refers to the index of market risk; AG_{t+1} denotes future asset growth; $DivYield_t$ refers to cash dividend yields (cash dividend per share divided by year-end stock price); and $EPSGR_t$ is the current earnings growth.

3. Empirical results

In order to effectively analyze the relationship between dividend payout ratios and future earnings growth for dual-dividend payouts, we must first of all undertake separate examination of the cash- and stock-dividend samples in the pooled cross-sectional data[1]. We can then combine the findings on both types to undertake further exploration of the pattern displayed by the dual-dividend sample. Thereafter, we can replace future earnings growth with future returns to complete our inquiry.

3.1. Cash dividends. According to the dividend information content hypothesis, companies will effectively convey their optimistic prospects for future earnings by paying higher cash dividends; however, this notion was recently challenged by Brav et al. (2005) who cited the views of many financial executives, that historical precedent plays an extremely important role in dividend payout decision-making and that managers will generally cut dividends only in extreme circumstances. In other words, they see high cash dividends as simply reflecting the efforts by managers to maintain historical payout levels.

In view of this, we pose three questions and then try to answer them sequentially using Models (1) to (3), as follows: (i) Do dividend payout ratios substantially affect future earnings growth? (ii) Do companies with higher dividends and higher yields have better profitability performance[2]? and (iii) Why do high dividend payout ratios equate to subsequent high earnings growth? The last of these questions is of course the core problem which we aim to answer in this study.

The results of Model (1), presented in the first column of Table 5, reveal that the coefficient on the

[1] In order to clarify the panel nature of our sample data, we employ the Breusch and Pagan (1980) LM test to ascertain the existence of either random effects or fixed effects in the error components. The existence of random effects is uniformly rejected in the three empirical samples (Prob > χ^2 = 0.9322 for the cash dividend sample, Prob > χ^2 = 0.3090 for the stock dividend sample, and Prob > χ^2 = 0.3676 for the dual dividend sample). A similar result is again found in the fixed effects test. Hence, the content of the pooled cross-sectional data justifies the use of the two-stage procedure of Fama and MacBeth (1973).

[2] This is an issue which is clearly of importance with regard to portfolio construction.

payouts was 1.101 and significant at the 10 per cent level, whilst more than half of the coefficients on the control variables were also significant and in line with our expectations. However, although we can reasonably determine from this that high dividend payouts do indeed favor future earnings growth, the evidence found thus far in this study is not as strong as the evidence reported by Zhou and Ruland (2006). Indeed, whilst we have been able to show that dividend payout ratios have a positive association with future earnings growth, we have also obtained the totally opposite result for the relationship between dividend yields and subsequent earnings growth.

We therefore go on to measure the interactions between dividend yields and the dividend payout ratios, using the following Model (2):

$$EPSGR_{t+1} = \alpha_0 + \beta_1 Payout_t + \beta_2 Size_t + \\ + \beta_3 ROA_t^e + \beta_4 Beta_t + \beta_5 AG_{t+1} + \beta_6 DivYield_t + \\ + \beta_7 DivYield_t * Payout_t + \beta_8 EPSGR_t + \varepsilon_t, \quad (2)$$

where $DivYield_t * Payout_t$ is the interaction term between dividend yields and the dividend payout ratio.

The results of Model (2), presented in the second column of Table 5, indicate that the coefficient of the payouts is significantly positive at the 5 per cent level; however, the interaction term is significantly negative, which indicates that high yields will partially offset the effects of high dividend payout ratios on future earnings growth. We therefore propose that, *ceteris paribus*, companies with high-dividend payout ratios and low yields will see greater contributions to their future earnings growth[1].

Finally, in Model (3) we examine why the dividend payout ratio is associated with future earnings growth:

$$EPSGR_{t+1} = \alpha_0 + \beta_1 Payout_t + \beta_2 Size_t + \\ + \beta_3 ROA_t^e + \beta_4 Beta_t + \beta_5 AG_{t+1} + \beta_6 DivYield_t + \\ + \beta_7 M/A_t + \beta_8 M/A_t * Payout_t + \beta_9 EPSGR_t + \varepsilon_t, \quad (3)$$

where $M/A_t * Payout_t$ is the interaction term between the dividend payout ratio and the opportunities for investment growth.

Both Arnott and Asness (2003) and Zhou and Ruland (2006) adopted the free cash flow hypothesis to support their empirical results and their explanations of the reasons why high dividend payout ratios were favorable to future earnings growth. The free cash flow hypothesis indicates that the managers of companies with ample cash will be tempted to over-invest (Jensen, 1986); however, where a company has a policy of high dividend payouts, large amounts of the company's cash would be consumed in paying such dividends. These companies would thereby reduce their agency costs and exempt themselves from capital waste.

In order to measure the cash flow of companies, in this sub-section we adopt market value divided by assets (*M/A*) as a proxy variable for the opportunities for investment growth, essentially because companies with greater opportunities, will generally have greater cash flows. Furthermore, companies pay higher dividends not only to mitigate the agency problems referred to above, but also for the purpose of solving serious problems of information asymmetry between their companies and outside investors; the dividend payout ratios of these companies will therefore be higher than average, irrespective of the motives.

Accordingly, we divide the sample into two (high-payout and low-payout) groups, based upon the median level of the dividend payout ratio, and then rerun the regression. As indicated in Model (3) of Table 5, no evidence was found to support the free cash flow hypothesis for the low-payout groups; however, we did find that the coefficients on the payouts and *M/A* were significantly positive for the high-payout group, with the coefficient of their interaction terms being significantly negative at the 5 per cent level. This indicates that, *ceteris paribus*, the substantial opportunities available to firms will actually weaken the effects of dividend payout ratios on future earnings growth. This finding is also in line with the results of Zhou and Ruland (2006).

Table 5. The association between future earnings growth and cash dividend payout ratios

Variables[a]	$EPSGR_{t+1}$					
	Model (1)		Model (2)		Model (3)	
	Coefficient[b]	*P*-value	Coefficient[b]	*P*-value	Coefficient[b]	*P*-value
Intercept	−1.923*	0.086	−2.636**	0.031	−8.557*	0.054
$Payout_t$	1.101*	0.094	2.052**	0.032	8.763*	0.051

[1] Under the supposition that high-dividend yields are unfavorable to future earnings growth, we further divided the sample into high-yield and low-yield groups based upon the median dividend yield. As a result of Model (1), the coefficient derived from the low-yield group increased to 2.307, and was significantly positive at the 5 per cent level; similar evidence is also found for future returns. These findings provide support for the overall results of Model (2) shown in Table 4.

Table 5 (cont.). The association between future earnings growth and cash dividend payout ratios

Variables[a]	$EPSGR_{t+1}$					
	Model (1)		Model (2)		Model (3)	
	Coefficient[b]	*P*-value	Coefficient[b]	*P*-value	Coefficient[b]	*P*-value
$Size_t$	0.077	0.318	0.081	0.305	0.115	0.242
ROA_t^e	28.349**	0.040	28.559**	0.036	27.241*	0.074
$Beta_t$	−0.350*	0.061	−0.331*	0.064	−0.041	0.931
AG_{t+1}	3.609*	0.056	3.590*	0.056	5.790*	0.086
$DivYield_t$	−9.607	0.141	2.124	0.574	−10.647	0.154
$DivYield_t * payout_t$	–	–	−16.910**	0.034	–	–
M/A_t	–	–	–	–	5.274*	0.084
$M/A_t * payout_t$	–	–	–	–	-6.637**	0.032
$EPSGR_t$	0.007	0.600	0.011	0.413	0.100	0.539
No. of obs.	497		497		248	
Average R^2[c]	0.306		0.311		0.497	

Notes: [a] The dependent variable $EPSGR_{t+1}$ denotes future earnings growth; $Payout_t$ denotes the ratio of dividend payouts (cash dividend divided by post-tax earnings); $Size_t$ denotes firm size; ROA_t^e denotes return on first quarter assets in year t+1; $Beta_t$ denotes the index of market risk; AG_{t+1} denotes future asset growth; $DiviYield_t$ denotes cash dividend yields (cash dividend per share divided by year-end stock price); $DivYield_t * Payout_t$ denotes the interaction term used to test the interaction between dividend payout ratios and dividend yields; M/A_t denotes the investment opportunities (the sum of book liabilities and stock equity value divided by book assets); $Payout_t * M/A_t$ denotes the interaction term used to test the free cash flow hypothesis; and $EPSGR_t$ denotes current earnings growth. [b] * indicates significance at the 10% level; ** indicates significance at the 5% level; and *** indicates significance at the 1% level. [c] Average R^2 is derived using the Fama-MacBeth procedure.

3.2. Stock dividends. Conventional wisdom argues that so-called stock dividends are not actually dividends at all, and that they merely increase issuance costs; indeed, as suggested by Elgers and Murray (1985), the reason for companies paying high dividends is not only to convey optimistic future profitability, but also to reduce their stock price to a reasonable level[1]. Nevertheless, many investors believe that more favorable stock dividends will be forthcoming for those companies with a high-growth condition.

In this sub-section, we set out to determine whether high stock dividends are linked to high future earnings growth, and, as Table 6 shows, we found no significant evidence for the stock-dividend sample. However, after classifying the observations into two groups based upon the median level of payout ratios, we found evidence of a positive association at the 10 per cent level in the low-payout group, evidence which suggests that dividend payout ratios are positively associated with future earnings growth, but that the ratio cannot be too high (higher than the medium).

Table 6. The association between future earnings growth and stock dividend payout ratios

Variables[a]	$EPSGR_{t+1}$			
	Stock dividend		Low-payout stock dividend	
	Coefficient[b]	*P*-value	Coefficient[b]	*P*-value
Intercept	−4.726*	0.058	−12.864	0.219
$Payout_t$	1.174	0.557	3.167*	0.095
$Size_t$	0.245*	0.072	0.355	0.107
ROA_t^e	53.859***	0.010	23.787*	0.071
$Beta_t$	−0.732	0.213	3.005	0.488
AG_{t+1}	2.403**	0.038	4.465	0.147
$DivYield_t$	−9.840	0.149	−4.595	0.116
$EPSGR_t$	−0.170	0.617	0.098	0.366
No. of obs.	203		101	
Average R^2[c]	0.478		0.587	

Notes: [a] The dependent variable $EPSGR_{t+1}$ denotes future earnings growth; 'Low-payout Stock Dividend' refers to those firms with stock dividend payout ratios below the medium; $Payout_t$ denotes the ratio of dividend payouts; $Size_t$ denotes firm size; ROA_t^e denotes return on first quarter assets in year t+1; $Beta_t$ denotes the index of market risk; AG_{t+1} denotes future asset growth; $DiviYield_t$ denotes stock dividend yields (stock dividend per share divided by year-end stock price); and $EPSGR_t$ denotes current earnings growth. [b] * indicates significance at the 10% level; ** indicates significance at the 5% level; and *** indicates significance at the 1% level. [c] Average R^2 is derived using the Fama-MacBeth procedure.

[1] This viewpoint is supported in many of the prior studies; see, for example, Lakonishok and Lev (1987); McNichols and Dravid (1990); Kato and Tsay (2002); and McManus et al. (2004).

3.3. Dual dividends. We have now completed most of the testing on the issue of major concern to this study; i.e., the association between dividend payout ratios and future earnings growth for cash-dividend and stock-dividend payouts. However, given the structural nature of dividend payouts in Taiwan, market participants may be more concerned about the relationship between high dividend payout ratios and high earnings growth for the dual-dividend payouts. Therefore, we use Model (1) to test this relationship in this sub-section, and then go on to explore the possible reasons for its existence. The results are shown in Table 7, from which we can see that the coefficient on the payouts is significantly positive at the 1 per cent level. Furthermore, we also found that the coefficients were significant for most of the control variables and that their signs were in line with our expectations.

Table 7. The association between future earnings growth and dual dividend payout ratios

Variables[a]	$EPSGR_{t+1}$					
	Dual dividend		Cash-dividend Inclined		Stock-dividend Inclined	
	Coefficient[b]	*P*-value	Coefficient[b]	*P*-value	Coefficient[b]	*P*-value
Intercept	−1.076**	0.043	−1.293	0.134	−0.471	0.343
$Payout_t$	0.785***	0.009	0.904***	0.010	0.306	0.152
$Size_t$	0.031	0.207	0.040	0.333	0.015	0.642
ROA_t^e	11.384***	0.000	9.635**	0.018	10.095***	0.000
$Beta_t$	−0.176*	0.068	0.064	0.780	−0.232	0.309
AG_{t+1}	1.196***	0.001	1.025***	0.002	1.260***	0.001
$DivYield_t$	−3.196***	0.002	−4.787***	0.002	−2.775**	0.025
$EPSGR_t$	−0.016	0.327	−0.091	0.0234	−0.036	0.377
No. of obs.	1,200		494		435	
Average R^2[c]	0.282		0.416		0.337	

Notes: [a] The independent variable $EPSGR_{t+1}$ denotes future earnings growth; if the firms in the dual-dividend sample pay more cash dividend than stock dividend, they are referred to as 'Cash-dividend Inclined'; otherwise they are referred to as 'Stock-dividend Inclined'; $Payout_t$ denotes the ratio of dividend payouts (the sum of cash dividend and stock dividend per share divided by post-tax earnings); $Size_t$ denotes firm size; ROA_t^e denotes return on first quarter assets in year t +1; $Beta_t$ denotes the index of market risk; AG_{t+1} denotes future asset growth; $DiviYield_t$ denotes cash dividend yields (the sum of cash dividend and stock dividend per share divided by year-end stock price); and $EPSGR_t$ denotes current earnings growth. [b] * indicates significance at the 10% level; ** indicates significance at the 5% level; and *** indicates significance at the 1% level. [c] Average R^2 is derived using the Fama-MacBeth procedure.

We then used several data processing methods to conduct some retests, as follows. Firstly, we used the median level of the dividend payout ratios to split the dual-dividend sample into two (high-payout and low-payout) groups. Secondly, we used a binary variable with a value of one if the payout ratio was higher than the median level; otherwise zero. Thirdly, we deducted the median level from the dividend payout ratios and reran the regression. No changes occurred to our earlier findings as a result of any of these three procedures. Finally, we used the cash or stock dividend payout ratios in the dual-dividend sample to replace the dual dividends, but the results (not reported here) were again similar. We therefore believe that high dividend payouts are indeed linked to strong earnings growth for the dual-dividend sample.

In recognition of the fact that the free cash flow hypotheses may not be applicable to the empirical results for the non-cash dividend sample, we carried out a comparison of the 'cash-dividend inclined' and 'stock-dividend inclined' samples in this study, and then went on to explore the rationale behind the empirical results (Table 7)[1]. However, given that only the coefficient on the cash-dividend inclined sample was significantly positive, this was of little help in explaining the issue why high dividend payout ratios equate to subsequent high earnings growth.

We therefore divided the cash-dividend inclined sample into several groups, gradually contracting the sample by 5 per cent intervals, until the cash dividend amounted to more than 90 per cent of the total dividend. At this point, the sample size had

[1] The dual-dividend sample comprised of firms which issued both cash and stock dividends. After excluding those observations with equal values of both, we divided the sample into two groups to determine which had the greater impact on earnings growth. The group of firms whose cash dividends accounted for more than 50 per cent of total dividends was subsequently referred to as 'cash-dividend inclined'; otherwise the firms were referred to as 'stock-dividend inclined'.

been reduced to 32 firms, considerably smaller than the original 494 firms, and barely sufficient for effective regression estimation[1]. However, as a result, we found that evidence of significance was only discernible in the 50 per cent, 55 per cent and 65 per cent groups, which was not in line with our expectations.

It seems, thus far, that we are not going to be able to provide any clear indication of whether payout ratios are positively related to future earnings growth; nevertheless, we should remind ourselves of the empirical results derived from the stock-dividend sample, that the payout ratios were positively associated with future earnings growth only in the low stock-dividend group, which, in other words, suggests that only stock dividend payout ratios below the median level are beneficial to future earnings growth. It would, therefore, appear that whilst stock dividends are required to be as high as possible, they must, nevertheless, be kept below the median level.

This explains, to some extent, why we could find no evidence of any significance in the 70 and higher per cent groups of the cash-dividend inclined sample. Specifically, the proportion of stock dividends should not exceed half, or fall below 30 per cent, of the total dividend. Based on this assessment, we conservatively estimate that only in those cases where the ratio of cash dividend to stock dividend falls within a range of 1 to 2.33 would this be of benefit to future earnings growth, essentially because within such a ratio, companies' investment opportunities would not be curbed by high cash dividends, and their future earnings would not be diluted by high stock dividends.

Finally, we used the five-year total of the dual-dividend payouts to confirm whether our proposed range holds; the results are presented in Table 2. We can see that cash dividends account for 62.57 per cent of the aggregate dual dividend, with stock dividends accounting for the remaining 37.43 per cent, giving a ratio of 1.67 for cash to stock dividends, which is within the range suggested above.

3.4. Future returns. We know, from the foregoing analysis, that the dividend payout ratio does have a significant association with future earnings growth; however, investors will ultimately be interested in the relationship that exists between payout ratios and future returns. A variety of studies (for example, McManus et al., 2004) have already confirmed that high dividend payout ratios equate to high future returns; therefore, in this sub-section, we use Model (4) to determine whether such an association might also be found in Taiwan.

$$SPGR_{t+1} = \alpha_0 + \beta_1 Payout_t + \beta_2 Size_t + \beta_3 ROA_t^e + \\ + \beta_4 Beta_t + \beta_5 AG_{t+1} + \beta_6 DivYield_t + \beta_7 SPGR_t + \varepsilon_t, \quad (4)$$

where $SPGR_{t+1}$ denotes future returns (the growth rate for the price of common stocks from year t to year t +1); $SPGR_t$ denotes current returns (the growth rate for the price of common stocks from year t –1 to year t); with the remaining variables being defined in the same way as in Model (1).

To facilitate our analysis of the companies in the dual-dividend sample, we further divided the sample into three (high dual dividend, high cash dividend and high stock dividend) groups, in which the firms with low payout ratios were excluded, to test whether the high-dividend payout ratios would be linked to strong future returns[2].

The underlying reasoning for the above procedure is provided by the empirical results of Lang and Litzenberger (1989), and other studies[3], which found that those companies which paid cash dividends, and which also had quite limited growth opportunities, would enjoy greater increases in their stock prices; in other words, those groups with higher dividend payout ratios will tend to have higher future returns.

Furthermore, we find that the amount of cash dividends paid by companies in the dual-dividend sample is actually much higher than that for the sample of companies paying cash dividends only. Therefore, we can also expect to see the results reported for the cash-dividend sample being applicable to the dual-dividend sample. The results are presented in Table 8, which shows that the coefficients on the payouts are all significantly positive for any of the dual-dividend payout sub-samples.

[1] This method was enlightened by Elgers and Murray (1985), who suggested that when companies issued stock dividends, in either large or small amounts, they were effectively conveying their future earnings growth, with the goal of those companies paying small amounts being to preserve their retained earnings rather than to achieve a reduction in their stock prices. In view of this, this study hypothesizes that those companies which have a higher ratio of cash dividend to stock dividend will see greater benefits, in terms of future earnings growth.

[2] High dual dividends are defined as those with dividend payout ratios that are higher than the median level of dual-dividend payout ratios, whilst high cash (stock) dividends in the dual-dividend sample are defined as those with ratios that are higher than the median level of cash (stock) dividend payout ratios.

[3] Other studies include Lang et al. (1991); Vafeas and Joy (1995); and Vafeas and Shenoy (2005).

Table 8. The association between future returns and dual dividend payout ratios

Variables[a]	$SPGR_{t+1}$					
	High dual dividend[b]		Dual-dividend sample			
			High cash dividend[b]		High stock dividend[b]	
	Coefficient[c]	*P*-value	Coefficient[c]	*P*-value	Coefficient[c]	*P*-value
Intercept	0.336	0.336	−0.246	0.633	−0.093	0.680
$Payout_t$	0.503*	0.067	0.322***	0.009	0.235*	0.053
$Size_t$	0.002	0.948	0.003	0.934	0.002	0.938
ROA_t^e	4.013*	0.064	5.012**	0.045	4.001**	0.041
$Beta_t$	−0.071	0.747	0.030	0.887	−0.090	0.639
AG_{t+1}	0.764**	0.028	0.563**	0.050	0.652*	0.087
$DivYield_t$	−2.126***	0.001	−2.465**	0.042	−1.735***	0.009
$SPGR_t$	−0.097	0.340	−0.161	0.166	−0.092	0.190
No. of obs.	600		600		600	
Average R^2[d]	0.347		0.389		0.300	

Notes: [a] The dependent variable $SPGR_{t+1}$ denotes the future return; if the firms in the dual-dividend sample pay more cash dividend than stock dividend, they are referred to as 'Cash-dividend Inclined'; otherwise they are referred to as 'Stock-dividend Inclined'; $Payout_t$ denotes the ratio of dividend payouts (the sum of cash dividend and stock dividend per share divided by post-tax earnings); $Size_t$ denotes firm size; ROA_t^e denotes return on first quarter assets in year t+1; $Beta_t$ denotes the index of market risk; AG_{t+1} denotes future asset growth; $DiviYield_t$ denotes cash dividend yields (the sum of cash dividend and stock dividend per share divided by year-end stock price); and $SPGR_t$ denotes the current return. [b] 'High Dual Dividend' refers to those firms with dual dividends above the medium; within the 'Dual-dividend Sample', High cash (stock) dividends refers to those firms with cash (stock) dividends above the medium. [c] * indicates significance at the 10% level; ** indicates significance at the 5% level; and *** indicates significance at the 1% level. [d] Average R^2 is derived using the Fama-MacBeth procedure.

In particular, the coefficients in the high cash dividend sub-sample are significant, even at the 1 per cent level, with more than half of the coefficients on the control variables being significant and having signs that are in line with our expectations. Given that these results have, to some extent, re-emphasized the major findings of Zhou and Ruland (2006), we can state, with some confidence, that the type of dividend does significantly affect the empirical results.

In our earlier explanation of the control variables, we suggested that large firm size may be detrimental to future earnings growth; however, no significant evidence has in fact been found in our analysis. Therefore, in this sub-section, we use Model (5) to carry out in-depth analysis of the way in which firm size affects future returns.

$$SPGR_{t+1} = \alpha_0 + \beta_1 Payout_t + \beta_2 Size_t + \beta_3 ROA_t^e + \\ + \beta_4 Beta_t + \beta_5 AG_{t+1} + \beta_6 DivYield_t + \\ + \beta_7 Size * Payout + \beta_8 SPGR_t + \varepsilon_t, \quad (5)$$

where *Size*Payout* is the interaction term between firm size and dividend payout ratio.

We summarize the empirical results of our analysis of the high dual-dividend group as follows. The respective coefficients on payout, firm size and their interaction term were 5.493, 0.277 and -0.326, with all of these being significant at the 5 per cent level. Based upon these results, we found that both firm size and dividend payout ratio had positive associations with future earnings growth; however, since their interaction term was negative, we conclude that larger firm size weakens the correlation between dividend payout ratios and future earnings growth.

For instance, if the average firm size (natural logarithm) is 15.362, the coefficient is reduced to 0.485. In other words, when the average firm size is larger than 16.850, the relationship turns from positive to negative. Hence, *ceteris paribus*, the best choice for investors in the construction of their portfolios may be small-sized firms with high dividend payout ratios.

4. Tests for robustness

So far, we have shown that high dual-dividend payout ratios are associated with strong future earnings. We now go on to adopt two other measures of earnings, along with earnings mean reversion, share repurchases, issuing markets, industry variations and cross-sectional data on individual years, to determine whether any changes occur to the empirical results.

4.1. Alternative earnings measures. In order to carry out an appropriate comparison, in this sub-section, we use *ROE* and *ROA* for the measurement

of future earnings, which is different from the *EPS* used by Zhou and Ruland (2006), reexamining the association between future earnings and dividend payout ratios to determine whether different types of measures will affect our results.

The results (not reported here) reveal that although the coefficients were all positive at the 1 per cent level, the respective average R^2 for the three types of variables in the dual-dividend sample were *EPS* (0.282), *ROE* (0.222) and *ROA* (0.198)[1]. This clearly indicates that the use of *EPS* may be a more appropriate choice, in terms of goodness-of-fit, for the measurement of future earnings.

4.2. The impact of earnings mean reversion. In order to take into accoount the impact of mean reversion on the results, we use current earnings growth as a control variable in Model (1). Here, we follow Zhou and Ruland (2006) to further classify the dual-dividend sample into four categories: (i) sub-sample 1 is a combination of high current growth and high dual dividends; (ii) sub-sample 2 combines high current growth with low dividends; (iii) sub-sample 3 combines low current growth with high dividends; and (iv) sub-sample 4 combines low current growth with low dividends. If mean reversion does exist, and a low dividend favors future earnings growth, we would expect to see sub-sample 1 providing evidence of a negative association between dividend payout ratios and future earnings growth, whilst sub-sample 4 should demonstrate a positive relationship, and sub-samples 2 and 3 should reveal indeterminate relationships.

However, the empirical results show a significantly positive relationship only for the coefficient on the payouts of sub-sample 1, whilst the coefficients for the remaining samples are not significant. As such, the empirical results derived apparently deviate from our expectations towards mean reversion. Furthermore, the tests of the cash-dividend and stock-dividend samples, which were performed using the same procedures, also failed to show any evidence of statistical significance. We therefore conclude that, our empirical results remain unchanged after considering the impact of earnings mean reversion, which is consistent with the findings of Zhou and Ruland (2006).

4.3. The impact of share repurchases. As opposed to raising dividends, competent managers will generally prefer share repurchases, or other ways of increasing their return on equity[2]. The importance of share repurchases is obvious; indeed, in 1998, this type of dividend dominated up to 48 per cent of all aggregate dividend payout ratios in the US (Allen and Michaely, 2003). In contrast, however, other types of dividends remain dominant with regard to dividend payouts in the Taiwan stock market, with share repurchases accounting for only 7.14 per cent of the aggregate payout in 2005.

Despite the fact that the comparative share of stock repurchases is relatively low, we nevertheless exclude any share repurchase observations and carry out a retest. For the dual-dividend sample, the coefficients on the payouts are also proved to be positive, which is consistent with our main findings reported earlier in this paper and similar to those of Zhou and Ruland (2006), although the coefficient for the stock-dividend sample remains insignificant and the coefficient for the cash-dividend sample turns from weakly correlated to insignificant (not reported here).

4.4. Issuing market and industry variations. As a result of market administration rules, the TSE market is more stable, in terms of profitability, than the Taiwan OTC market. We can therefore predict that it would be easier to find evidence of high dividends equating to subsequent high earnings growth in the TSE. As regards variations between industries, since the traditional industries are mostly at the mature stage of growth, their demand for capital will be far lower than that of the electronics industries. We therefore anticipate future earnings growth also having an association with dividend payout ratios in the traditional industries, and that their cash dividends will also be higher than in the electronics industries.

Table 9 shows that, with the exception of the OTC market, the respective coefficients for the dual-dividend sample were significantly positive at the 1 per cent, 2.5 per cent and 10 per cent levels for the TSE, traditional and electronic industries. Having further examined why the coefficient in the OTC market was not significant, we found that the ratio of cash dividends over stock dividends was only 0.96, whereas the ratio was larger than 1 for the other samples. This confirms that the cash/stock dividend ratio may affect future earnings growth for the dual-dividend sample. Finally, for the cash-dividend sample, the respective coefficients for the TSE and traditional industries were significantly positive at the 10 per cent and slightly larger than 10 per cent levels.

[1] These figures are derived from the two-stage procedure of Fama and MacBeth (1973).

[2] Brav et al. (2005) also found that US companies preferred share repurchase programs for the purpose of increasing the return on equity.

Table 9. The association between future earnings growth and dual dividends, by issuing market and industry differences (effects)

Variables[a]	$EPSGR_{t+1}$							
	TSE		OTC		Traditional industries		Electronics industry	
	Coefficient[b]	*P*-value	Coefficient[b]	*P*-value	Coefficient[b]	*P*-value	Coefficient[b]	*P*-value
Intercept	−0.899	0.131	0.320	0.907	−1.263	0.138	−1.140	0.118
$Payout_t$	0.830***	0.008	−0.154	0.901	0.917**	0.020	0.729*	0.081
$Size_t$	0.019	0.554	−0.009	0.939	0.046	0.346	0.001	0.964
ROA_t^e	11.651***	0.000	14.961*	0.072	9.321**	0.012	15.645***	0.000
$Beta_t$	–0.166***	0.001	−0.341	0.149	−0.051	0.763	0.136	0.422
AG_{t+1}	1.130***	0.003	1.752***	0.002	1.071	0.019	1.230***	0.000
$DivYield_t$	−3.412***	0.007	−4.441**	0.023	−4.385**	0.014	−2.795***	0.006
$EPSGR_t$	−0.012	0.213	−0.124	0.389	−0.058	0.278	−0.041	0.361
No. of obs.	919		281		501		699	
Average R^{2}[c]	0.277		0.531		0.310		0.346	

Notes: [a] The dependent variable $EPSGR_{t+1}$ denotes future earnings growth; $Payout_t$ denotes the ratio of dividend payouts (the sum of cash dividend and stock dividend per share divided by post-tax earnings); $Size_t$ denotes firm size; ROA_t^e denotes return on first quarter assets in year t+1; $Beta_t$ denotes the index of market risk; AG_{t+1} denotes future asset growth; $DiviYield_t$ denotes cash dividend yields (the sum of cash dividend and stock dividend per share divided by year-end stock price); and $EPSGR_t$ denotes current earnings growth. [b] * indicates significance at the 10% level; ** indicates significance at the 5% level; and *** indicates significance at the 1% level. [c] Average R^2 is derived using the Fama-MacBeth procedure.

4.5. Verification of individual years in the cross-sectional data. Thus far, we have provided evidence to indicate the existence of a linkage between high dividend payout ratios and future earnings growth; however, it is quite likely that competent fund managers and researchers would question whether the results provided here are sufficiently strong for practical application. More specifically, even where studies have found favorable evidence in pooled cross-sectional data, this would be of little help to investors with regard to their annual investment planning. It is clear, therefore, that for the purpose of practical application, similar results should also be demonstrated in the cross-sectional data on individual years.

To deal with this issue, we retested the cross-sectional data on the dual-dividend sample; the results are presented in Table 10, which shows that, with the exception of the years 2001 and 2003, the coefficients on the payouts were all significantly positive at 1 per cent level. The coefficient for 2003 was, however, significant at the 2.5 per cent level, and when we reran the high dividend sub-sample for the year 2001, the coefficient was again significantly positive at close to 1 per cent. However, we could find significant results for the cash-dividend sample only for the years 2001 and 2003. Thus, in general, the results derived from the pooled cross-sectional data for the dual-dividend sample were also found in the cross-sectional data on individual years.

Table 10. The association between future earnings growth and dual dividend payout ratios, by year[a]

Variables[b]	$EPSGR_{t+1}$									
	2000		2001		2002		2003		2004	
	Coefficient[c]	*P*-value	Coefficient[c]	*P*-value	Coefficient[c]	*P*-value	Coefficient[c]	*P*-value	Coefficient[c]	*P*-value
Intercept	−1.140	0.198	−0.667	0.310	−2.070***	0.003	−1.567***	0.006	0.064	0.882
$Payout_t$	1.160***	0.003	0.273	0.397	1.139***	0.001	0.753**	0.014	0.602***	0.007
$Size_t$	−0.016	0.731	0.044	0.218	0.088**	0.027	0.055	0.119	−0.016	0.568
ROA_t^e	12.637***	0.001	13.071***	0.000	11.252***	0.000	11.648***	0.000	8.312***	0.000
$Beta_t$	−0.141	0.556	−0.241**	0.041	−0.140	0.387	0.039	0.790	−0.394***	0.005
AG_{t+1}	0.960***	0.004	0.830***	0.000	1.175***	0.000	1.587***	0.000	1.425***	0.000
$DivYield_t$	−1.379*	0.062	−3.791***	0.000	−3.734***	0.000	−3.787***	0.000	−3.291***	0.000

Table 10 (cont.). The association between future earnings growth and dual dividend payout ratios, by year [a]

Variables [b]	$EPSGR_{t+1}$									
	2000		2001		2002		2003		2004	
	Coefficient [c]	*P*-value	Coefficient [c]	*P*-value	Coefficient [c]	*P*-value	Coefficient [c]	*P*-value	Coefficient [c]	*P*-value
$EPSGR_t$	−0.000	0.971	−0.074	0.153	−0.002	0.679	−0.005	0.846	−0.003	0.286
No. of obs.	134		124		218		313		411	
Adjusted R^2	0.252		0.312		0.219		0.245		0.248	

Notes: [a] The association examined in this table is verified by cross-sectional data on individual years. After running the regression, an investigation was undertaken to determine whether heteroskedasticity was present. If where heteroskedasticity was found, the model was then rerun using bias corrections. [b] The independent variable $EPSGR_{t+1}$ denotes future earnings growth; $Payout_t$ denotes the ratio of dividend payouts (the sum of cash dividend and stock dividend per share divided by post-tax earnings); $Size_t$ denotes firm size; ROA_t^e denotes return on first quarter assets in year t +1; $Beta_t$ denotes the index of market risk; AG_{t+1} denotes future asset growth; $DiviYield_t$ denotes cash dividend yields (the sum of cash dividend and stock dividend per share divided by year-end stock price); and $EPSGR_t$ denotes current earnings growth. [c] * indicates significance at the 10% level; ** indicates significance at the 5% level; and *** indicates significance at the 1% level.

4.6. The impact of economic cycle and industry effect. Finally, the main results of this paper may be affected by economic cycle and industry effect. Accordingly, we adopt IND_i as an industry dummy to classify companies into their corresponding industries (as defined by the TSE) and the GDP growth rate, $GDPGR_t$, as a control variable for the economic cycle (Bekaert, Harvey and Lundblad, 2006; Furceri and Karras, 2007). The modified regression model is then as follows.

$$EPSGR_{t+1} = \alpha_0 + \beta_1 Payout_t + \beta_2 Size_t + \\ + \beta_3 ROA_t^e + \beta_4 Beta_t + \beta_5 AG_{t+1} + \beta_6 DivYield_t + \\ + \beta_7 EPSGR_t + \beta_8 GDPGR_t + \sum_i^n \varphi_i IND_i + \varepsilon_t. \quad (6)$$

The empirical results (not reported in the study) indicate that for the dual dividend sample, the payout ratios still retain their positive effect on future earnings growth at the 1% level of significance, with more than half of the control variables remaining consistent with our original results. Furthermore, the original main findings are also maintained for both the cash dividend sample and the stock dividend sample. This new evidence therefore indicates that the main results of our study remain robust to the inclusion of additional factors relating to the economic cycle and industry affiliations.

Conclusions

Recent studies have shown that within the industrialized nations, such as the US and Japan, the dividend payout ratios of those companies paying cash dividends are linked to strong future earnings growth. However, since firms paying dividends in Taiwan do not concentrate on cash dividends, the cash-dividend sample is relatively small. Cash dividend payouts in Taiwan in 2005, for example, accounted for only 16.59 per cent of the aggregate sample, whilst in the same year, dual dividends accounted for a massive 75.67 per cent. In light of this, in addition to other types of dividends, our particular research focus is on dual dividends.

The empirical results show that for the dual-dividend sample, high dividend payout ratios equate to higher earnings growth. Further analysis demonstrated that this was more significant in the 'cash-dividend inclined' sample, and we found that the ideal cash to stock dividend ratio should not exceed 2.33. The supporting evidence for this ratio also comes from combining both the empirical results shown in the cash dividend sample, where we found only weak evidence to support the hypothesis of an association between dividend payouts and future earnings growth, and in the stock-dividend sample where the association posited in this study was discernible only in the low payout group.

As regards future returns, high dividend payout ratios are also found to be associated with subsequent strong high returns for the dual-dividend sample. In addition, following retests using other earnings measures, as well as earnings mean reversion, share repurchases, cross-sectional data on individual years, and economic cycle and industry effect, no changes occurred to the results reported earlier.

When examining the relationship between dividend payout ratios and other variables, we also found two interesting results. Firstly, for the cash-dividend sample, if investors construct their investment portfolios with criteria based upon dividend payout ratios and yields, firms with high dividend payout ratios and low dividend yields will have better future earnings growth performance, *ceteris paribus*. Secondly, for the dual- dividend sample, if the selection criteria are based on dividend payout ratios and firm size, investors should choose small-sized companies with high dividend payout ratios.

Following Zhou and Ruland (2006), and extending the overall objectives in this study, we have obtained empirical results that differ significantly from those of many of the other prior studies. However, some areas of concern remain, such as how to appropriately interpret the results of the dual-dividend sample and how to apply the results in practice. In essence, the empirical outcome in this study, with regard to dual dividends, represents only a pioneering cornerstone. We would like to see further research into dual dividends, with thorough delineation of the dividend payout ratios and effective application within the securities markets.

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