Peer Effects on Firm Dividend Policies in Taiwan

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Abstract

With the dividend-paying culture increasingly taking hold in corporate Taiwan, this paper investigates the effects of industry peers on the corporate dividend policies in the country. By employing the instrument variable technique, we find strong evidence that the payout policies of Taiwanese firms are positively influenced by the policies of their industry peers. This peer influence tends to be stronger for companies operating in industries with lower product competition and higher information uncertainty, indicating that firms imitate the dividend policies of their peers for information-based reasons. Younger, smaller and harder-to-value companies are also more likely to mimic their larger, older and easier-to-value peers. Our findings are robust to alternative definitions of control variables, instrument variable and industry classifications.

Keywords: Dividend policy, Peers effect, Taiwan

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1. Introduction

In their pivotal paper, Modigliani and Miller (1961) argued that in a world of perfect information, full capital mobility, no taxes and no agency costs, the payout policy of a company should be irrelevant to its firm value. However despite their irrelevance theorem, the existence of imperfect capital markets in the real world means that dividend policy continues to be a hotly debated subject in corporate finance literature. Over the last few decades, extensive studies have been performed to better understand the various determinants of firm payout ratios, and several hypotheses have been put forward to explain corporate dividend policy, including the catering theory (Baker and Wurgler, 2004), tax preference hypothesis (Miller and Scholes, 1978), the demographics clientele theory (Lee, 2011) and the retail minority shareholder hypothesis (Lee, 2010).

In recent years, a particular strand of research has emerged that focuses on investigating the influence of industry peers on corporate financial policies. Studies into peer effects are however not new in academia, and much of the pioneering work on peer effects had originally be done in the field of education economics. For example, in one of the more widely-cited research, Hoxby (2000) found that students are significantly affected by the achievement level of their peers. When exposed to an unusually low achieving cohort, good students often end up scoring lower marks themselves, while low achievers who are being surrounded by high achievers frequently do better. Interestingly, the effects of peers are not just confined to the classroom. A study of the workplace by Mas and Moretti (2009) yielded similar results. When they analysed data from a large supermarket chain, they found strong evidence that the productivity of a worker is dependent on the productivity of his/her coworkers in the same team. By introducing a highly productive personnel into a shift, the productivity of the overall team is greatly enhanced as the positive productivity of that individual spills over.

Within the field of corporate finance, the seminal paper by Leary and Roberts (2014) is perhaps one of the first to extend the study of industry peer effects to company financial policies. When they looked at 9,126 US firms over the period of 1965 to 2008, Leary and Roberts (2014) found that the financing decisions and, to a lesser degree, the characteristics of peer firms[2] are important determinants of firm capital structures. In particular, they observed that smaller, less successful firms are highly sensitive to their larger, more successful peers, although the reverse is not true. When Adhikari and Agrawal (2018) expanded the investigation to the payout policies

[2] Leary and Roberts (2014) and Adhikari and Agrawal (2017) define peer groups based on their three-digit SIC industry codes.

of US public firms, they found robust evidence of firms' payout policies being significantly influenced by the policies of their industry peers.

It is clear that deeper research in this field, especially on the effects of peers on dividend policies, will be very interesting. This is particularly true for Taiwan, a country traditionally celebrated for its semiconductor and technology hardware prowess, and where the topic of dividend policy has always been controversial. This is because technology companies have historically balked at paying more than token dividends in lieu of financing the rapid growth of their own operations, and most managers have often viewed dividend payments as an ultimate admission that the growth phase is over. In a market where technology firms make up close to half of the total capitalisation, it is therefore not surprising that dividend-paying companies were the minority during the late-1990s. However over the last two decades, the dividend-paying culture in Taiwan picked up significantly (Figure 1). By the middle of 2016, the Taiwanese market was already boasting a hefty average dividend yield of 4.69%, with the Taiwan Stock Exchange (TWSE) particularly calling out the yield premium of the country over several major markets in the Asian region as well as its relative attraction to investors[3]. In fact in early 2017, the TWSE started disclosing, for the first time, the average cash dividend yield on the local main board on a monthly basis, a move that also brings it in line with international practice. In explaining the change, the TWSE highlighted that "with more listed companies on the local equity market preferring to give cash dividends to shareholders, like their international counterparts, the exchange now discloses the cash dividend yield to investors each month"[4]. Given the rising importance of dividends in the Taiwan equity market, a richer understanding of the determinants of corporate payout policy in the country, especially the role of peer effects, will be of great importance. This paper also adds to current literature by investigating the influence of peers on dividend policies within an institutional framework that mostly constrains the use of share buybacks. In the study by Adhikari and Agrawal (2018) for example, the focus had been on the US market where companies can freely utilise both dividends and share repurchases as their payout tools. According to them, firms can therefore sometimes deflect peer pressure to initiate dividends by repurchasing shares. Firms in Taiwan are however unlikely to do the same as share repurchases were prohibited until 19 July 2000. Even after they were being allowed, there were still major restrictions imposed on its use. These restrictions include limiting the accumulated repurchased shares to 10% of the outstanding shares, as well as confining the maximum number of shares permitted for each repurchase to 2% of the registered number of shares. In addition, the decision by the Taiwanese government in the beginning of January 2008 to treat the bonuses of employees as an expense is also widely believed to have affected companies' decisions to repurchase shares. Without share repurchases as a viable alternative payout tool, this should imply that peer influence on dividend policy will be more pronounced. An investigation of the peer effect within the Taiwanese market is therefore of interest.

[3] http://www.taipeitimes.com/News/biz/archives/2016/07/02/2003650133
[4] http://focustaiwan.tw/news/aeco/201702110026.aspx

This paper therefore sets out to investigate the effects of peers on the dividend policies of Taiwanese companies. Casual empiricism certainly suggest that peer dividend policies exert strong influences on Taiwanese corporates' payout policies. For example, Ejinsight[5] reported in 2014 about how "contract manufacturer Hon Hai Precision […] is coming under intense pressure from big shareholders to boost dividends" as the company only "paid out 19 percent of its 2013 profit to shareholders compared with an average of 60 among a group of Taiwanese peers including fellow Apple assembler Pegatron Corp and personal-computer Compal Electronics". Meanwhile, when President Wu Ching-Tien of Taiwanese petrochemical giant Taiwan Styrene Monomer presented[6] to his shareholders in January 2019, he specifically compared his company's dividend yield to its peers, Grand Pacific Petrochemical and Formosa Chemical & Fibre, in order to highlight its stronger financial performance. This likely reflects the importance of peer dividend policies when the company is considering its own payout policy. This paper looks at 971 companies listed on the Taiwan Stock Exchange over the period of 1995 to 2017, and employs the instrument variable technique to overcome the identification posed by regressor endogeneity before performing its regression analyses. We find that the payout policies of Taiwanese firms are significantly and positively influenced by the policies of their industry peers. Our conclusions are robust to alternative definitions of control variables, instrument variable and industry classifications. We then extend our analysis to understand the reasons driving this peer influence, and find evidence that companies imitate their peers for information-based reasons. In particular, younger, smaller and harder-to-value firms are more likely to mimic the dividend policies of their older, larger and easier-to-value peers.

The rest of the paper is structured as follows: Section 2 discusses the data sample and methodology pursued in this paper including the construction of the instrument variable, while Section 3 reports the empirical results and the robustness checks performed. Section 4 delves into the peers effects channels as well as the characteristics of mimicking and mimicked firms. We conclude the paper in Section 5.

2. Data Sample and Empirical Methodology

Our paper focuses on the companies in Taiwan, and our sample consists of all the firms listed on the Taiwan Capitalization Weighted Stock (TAIEX) Index between 1995 and 2017 that have non-missing data for the variables required in our relevant regressions. Company data is

[5] http://www.ejinsight.com/20141231-hon-hai-under-pressure-to-boost-transparency-dividends/
[6] http://irtsmc.com/pdf/taiwan_styrene_monomer.pdf

obtained from Factset and Bloomberg. Detailed explanations of the variables used in this study are found in Appendix A.

2.1. The Empirical Model

We employ an empirical model that is consistent with Adhikari and Agrawal (2018) and Grennan (2018):

$$Div_{ijt} = \alpha + \beta\overline{Div}_{-ijt} + \gamma'\bar{X}_{-ijt} + \lambda'X_{ijt} + \delta'\mu_j + \varphi'\upsilon_t + \varepsilon_{ijt} \quad (1)$$

where the indices i, j and t correspond to firm, industry and fiscal year respectively. The outcome variable Div_{ijt} is a measure of the dividend policies of firm i in industry j in fiscal year t, while the covariate $\overline{Div}_{-ijt}$ represents the peer firm average dividend policies. Peer firms are defined as all firms within the same industry except firm i. Industries are classified according to the Taiwan Stock Exchange (TWSE) Stock Industry Category. Because firms' dividend policy decisions are influenced by one another, therefore firm i's dividend policy is a function of firm j's dividend policy and vice versa. This renders $\overline{Div}_{-ijt}$ as an endogenous regressor, and leads to an identification problem which was first highlighted by Manski (1993) in his linear-in-expectations model with social interactions. We resolve this through the use of instrument variables, a methodology also adopted by Leary and Roberts (2014), Adhikari and Agrawal (2018) and Grennan (2019). To limit the response time of firms influencing one another so as to identify the peer effects more cleanly, we use a contemporaneous $\overline{Div}_{-ijt}$ measure.

The vectors $\bar{X}_{-ijt}$ and X_{ijt} are the control variables representing peer firm averages and firm-specific characteristics respectively. We have specifically chosen the control variables that best represent factors commonly observed in academic literature to be important determinants of dividend policy, namely profitability, financial leverage, investment opportunities and size.

Profitability is found in financial literature to influence dividend policy. Studies by DeAngelo and DeAngelo (1990) and DeAngelo et. al. (1992) observed that a large proportion of loss-making companies omit dividends entirely, while Jensen et. al. (1992) also found evidence of a positive relationship between the return on assets of firms and their dividend payouts. Following Jensen et. at. (1992), we use return on assets as a proxy for profitability and expect a positive relationship to dividend policy.

Financial leverage has been known to affect dividend policy as a result of the debt covenants and related restrictions imposed by debtholders (Higgins, 1972; McCabe, 1979). In particular, because paying dividends reduces the cash holdings of a firm, it results in greater reliance on external financing. As such, a firm with higher financial leverage will tend to choose a lower payout policy to lower its costs of external financing. In our paper, we use the ratio of long-term debt to equity as a proxy for financial leverage and expect a negative relation between financial leverage and dividend policy.

The size effect is controlled here by the inclusion of the natural logarithm of market capitalization. Some studies have theorized that because large companies are typically better-diversified businesses with limited future growth opportunities, they are therefore more likely to pay their free cash flows out as dividends. On the other hand, other studies have argued that the theoretical grounding for the influence of the size effect on payout policy is not robust, and have instead found a negative relationship (Allen and Michealy, 2003). As such while we include size as a control variable, we do not have particular expectations for its sign.

Because investments and dividends compete for the use of the cash resource in a firm, the investment opportunity set is often negatively related to corporate payout policy (Gaver and Gaver, 1993). Following Kallapur and Trombley (1999), investment opportunities are measured as the realized growth in the firm's assets in our paper.

μ_j is the industry fixed effects, υ_t is the year fixed effects and ε_{ijt} is the heteroscedastic firm-specific error tern that is assumed to be correlated within the firm. α, β, γ', λ', δ' and φ' are the regression coefficients, with λ', δ' and φ' capturing the first explanation for common industry behavior such as shared characteristics or the institutional environment, while β and γ' measures the influences of peer firm actions and characteristics respectively on firm dividend policy choices.

2.2. Construction of the Instrument Variable

As mentioned earlier, the main difficulty in using equation (1) to disentangle the various effects driving industry commonality in payout policy is in the presence of $\overline{Div}_{-ijt}$ as a regressor due to its endogeneity. To resolve the ensuing identification problem caused by the simultaneity in firm and peer dividend policies, Leary and Roberts (2014) proposed a novel idea of first extracting the return shock in stocks. This is then used to calculate the exogenous peer firm characteristic which is finally applied as an instrument variable to identify equation (1).

To do this, we first estimate the return shocks with an augmented market model for stock returns:

$$R_{ijt} = \alpha_{ijt} + \beta_{ijt}^{Mkt} MKT_t + \beta_{ijt}^{IND}\left(\bar{R}_{-ijt} - RF_t\right) + \beta_{ijt}^{HML} HML_t + \beta_{ijt}^{SMB} SMB_t + \beta_{ijt}^{WML} WML_t \quad (2)$$

where R_{ijt} is the total return for firm *i* in industry *j* over month *t*, MKT_t is the excess return on the market, HML_t is the value factor, SMB_t is the size factor, WML_t is the momentum factor, and $\left(\bar{R}_{-ijt} - RF_t\right)$ is the excess return on an equal-weighted industry portfolio excluding firm *i*'s return, with industries being defined by the TWSE Stock Industry Category. It is worth noting that while $\left(\bar{R}_{-ijt} - RF_t\right)$ is not one of the Fama-French and Carhart risk factors, it is included in our augmented market model to remove any variation in returns that is common across firms in the same peer group.

The regression equation (2) is estimated for each firm on a rolling monthly basis using historical monthly returns where we require at least 24 months and up to 60 months of historical data. The expected monthly returns are then calculated using the estimated factor loadings and the realized factor returns of the month, with the residuals being the idiosyncratic equity risk:

$$\text{Expected return: } \hat{R}_{ijt} = \hat{\alpha}_{ijt} + \hat{\beta}_{ijt}^{Mkt} MKT_t + \hat{\beta}_{ijt}^{IND}\left(\bar{R}_{-ijt} - RF_t\right) + \hat{\beta}_{ijt}^{HML} HML_t + \hat{\beta}_{ijt}^{SMB} SMB_t + \hat{\beta}_{ijt}^{WML} WML_t \quad (3)$$

$$\text{Idiosyncratic return: } \hat{\eta}_{ijt} = R_{ijt} - \hat{R}_{ijt} \quad (4)$$

We finally compute the idiosyncratic equity risk as the logarithm of the standard deviation of the monthly idiosyncratic equity shock over the last one year (Adhikari and Agrawal, 2018; Grennan, 2019). The peer average equity risk thus calculated is then used as the instrument variable for predicting peers' dividend policies.

It is worth noting the two differences between our choice of instrument variable compared to that of Leary and Roberts (2014). Firstly, our augmented market model for stock returns expands on that used by Leary and Roberts (2014) to also include the Fama-French and Carhart risk factors as they have been shown by general corporate finance literature to be important drivers of stock return variation. Secondly, because idiosyncratic equity returns are not known to be relevant determinants of dividend changes, we have chosen to focus instead on idiosyncratic equity risk which is a known driver of dividend policy (Hoberg and Prabhala, 2009).

3. Empirical Findings

3.1. Summary Statistics

Table I shows the summary statistics for our estimated factor regressions. Most of the regressions have a full five-year (60 months) window of historical data, with the average number of months per rolling regression being 57. The adjusted R-squared is also fairly high at an average of 0.435 and a median of 0.452, indicating that the Fama-French and Carhart factor models explain a reasonable proportion of the systematic variation in stock returns. The factor regressions exhibit positive loads to market, size, momentum and industry beta factors, and negative load to the value factor. Figure 2 shows the distribution in peer firm average idiosyncratic equity risk, with the unconditional mean being 3.321. Table II displays the summary statistics of the dependent and independent variables used in our regressions. Our sample comprises of 971 unique firms and 11892 firm-year observations.

3.2. Empirical Results

Table III presents the results of our two-stage least squares (2SLS) regressions of estimating equation (1). The dependent variable is indicated at the top of each column, with the coefficient estimates in the body and the respective t-statistics in parentheses below. The results for dividend payer, dividend payout and dividends-to-assets are in columns (1) to (3) respectively. The coefficients on the instrument from the first-stage regressions are shown at the bottom of the table, and they indicate that the industry average equity risk is strongly negatively correlated with the industry average dividend policy. This is consistent with the survey findings of Lintner (1956) and Brav, Graham, Harvey and Michaely (2005). Their surveys have noted that there is

often a high degree of conservatism exhibited by corporates in the setting of dividends, which implies that dividends and risk are negatively related.

The row at the top labeled "Dependent Variable" shows the estimated coefficient on the instrumented peer firm outcome variable i.e. $\hat{\beta}$. For all the dividend measures, our results indicate that firms' dividend policies are significantly positively influenced by the dividend policies of their peers. For example, when peer firms increase the dividend payout by 1%, a company is also likely to raise their dividend payout by 0.926%. This also means that for a one-standard-deviation increase in the dividend payout of peer firms, a company is likely to raise its own dividend payout by 0.475 standard deviations. Similarly, when peer firms raise their dividends-to-assets by 1%, a corporate is more likely to increase its own ratio by 0.803%. In other words, a company is likely to improve its dividends-to-assets by 0.386 standard deviations for a one-standard-deviation increase in the dividend policy of its peer firms. Our results therefore show that peer effects play an economically significant role in determining variation in corporate dividend policies. The signs for the various firm-specific control variables are also as theorized in corporate finance literature, with the dividend policies of firms being positively related to the firms' profitability and size, and negatively related to its investment opportunities, leverage and idiosyncratic equity risk.

It is worth noting here that our analysis using 2SLS hinges critically on the instrument chosen being useful and appropriate. There are two tests we employ to examine this here. The first test is to investigate for instrument relevance to determine whether our instrument is sufficiently strongly correlated to the endogenous variable, being the peer dividend policy variable. An F-test is performed and the result is shown in Table III. We can see that for all three dividend policy variables, the test statistic is very large and significant at 1% level. The null hypothesis that the instrument is irrelevant is therefore rejected. Because the 2SLS technique should only be used if peer dividend policy is indeed an endogenous explanatory variable, we therefore also test for exogeneity by employing the widely-used Hausman-Wu test. We can see from the table that for all our dividend policy variables, the test statistics are extremely large. The null hypothesis of instrument exogeneity is therefore rejected at 1% significance level.

3.3. Robustness checks

In order to satisfy that our findings are robust, we conduct a battery of additional checks.

In our first robustness check, we adopt alternative measures of the control variables. In particular, we represent our measures of profitability, investment opportunities, size and leverage using Return-on-Equity, Book-to-Equity, Total Sales and Total-Debt-to-Total-Capital respectively. Columns (4) to (6) in Table IV shows our results. For both the dividend policy measures, the peer dividend policies remain statistically-significant positive determinants of firms' dividend policies.

In our second robustness check, we adopt an alternative augmented market model to describe stock returns. As noted earlier, the augmented market model employed by Leary and Roberts (2014) only uses two risk factors, namely the market premium factor and the industry risk factor, while our augmented model extends on theirs to also include the Fama-French and Carhart risk factors. Using the simpler model of Leary and Roberts (2014) and employing the same calculation methodology, we re-estimate the idiosyncratic equity risk for all the firms in our sample to calculate our alternative instrument variables. The results are exhibited in Columns (7) to (9) where we can see that peer influences remain economically important drivers of firm dividend policies.

In our third robustness check, we adopt different industry classifications to define firms' peer groups. While the TWSE Industry Stock Industry Categories classifies companies into 29 different categories, the MSCI GICS Sector Classifications breaks the market universe down into ten sectors, which makes for coarser industry definitions and larger peer group sizes. Columns (10) to (12) shows the results of our estimates when the MSCI GICS Sector Classifications are being used to define the peer groups. Thus even under broader peer group definitions, it can be seen that peer influences remain positive significant factors influencing companies' dividend policies.

Our earlier results are therefore robust to alternative definitions of control variables, instrument variable and peer group classifications.

4. Channels of and Heterogeneity in Peer Effects

4.1 Channels of Peer Effects

Having established the significance of peer effects on firm dividend policy, it is important, at this point of the study, to distinguish the channels through which peer effects operate, particularly whether they are coming through the actions or characteristics of the peer firms. To better explain this point, we use an illustration that is analogous to the one provided by Leary and Roberts (2014). Imagine a hypothetical scenario where firm A undertakes a capacity expansion program which increases its idiosyncratic equity risk. In the following period, firm A cuts its dividends and retains more earnings in order to finance its higher capital expenditure. In response, peer firm B also reduces its dividend payout. In this case, is firm B reacting to the change in dividend policy of firm A, or is it responding to the introduction of new capacity in the industry (i.e. information about their peer that is embedded in the stock return and risk)?

In order to distinguish between the two channels, we observe the heterogeneity in firms' dividend policy responses to their peers' equity risks. We do this by first performing a double-sort of our data based on quintiles of our peer firm average equity risk and peer firm dividend policies. Within each quintile combination, we then compute the average dividend policies for firm *i*, and examine the pattern of changes across the quintiles.

The results[7] are shown in Table V where quintile "1" represents the highest 20% of the distribution and quintile "5" the lowest. The results are largely similar for the three dividend policy variables. For brevity, we will focus on the dividend payout variable here in Panel B of Table V. We can see, for example, that the average dividend payout among firms in the lowest peer firm equity risk and highest peer firm dividend payout bracket is 63.582% with a t-statistic of 70.386. There is also a clear monotonic decline across each row. This means that when the peer firm equity risk is held constant, the dividend payouts of firms decline as the payout ratios of peer firms fall. The converse is however not true, When we hold the dividend payout quintiles fixed, the average payout of firms are largely uncorrelated as the peer firm equity risk increases. This shows that firms will change their dividend policies in response to a change in peer firm equity risk only if it is also accompanied by a change in the peer firm dividend payout. When peer firm equity risk changes do not lead to a change in peer firm dividend policy, companies often do not alter their own dividend policies.

[7] While we perform this analysis for both dividend measures, we only present the results for dividend payout for brevity.

When we test the difference in means between the top and bottom quintiles by both peer firm average equity risk and peer firm dividend payout, we can also see that the differences are significant when the lagged peer firm average firm risk is being held constant for each quintile. On the other hand, the mean differences are not significant for three of the quintiles when peer firm dividend payout is being held constant. This again confirms that firms are responding to changes in their peers' dividend policies instead of changes in their equity risk.

4.2 Reasons for Peer Effects

Having shown that Taiwanese firms' dividend policies are influenced by that of their peers, we now try to identify the reasons for that in this section. We will be focusing on the payout variables of Dividend Payout and Dividend-to-Assets here for succinctness.

Lieberman and Asaba (2006) highlighted two broad categories of theories behind the reasons why companies imitate each other: (1) information-based theories, where firms follow the peers who are perceived to have superior information, and (2) rivalry-based theories, where firms mimic their peers in order to limit rivalry or maintain competitive parity. In particular, they point out that firms are more likely mimicking their peers for rivalry-based reasons if all of the following three conditions are satisfied:

Condition A: They compete in the same market or niche, and

Condition B: The information environment is not high uncertain, and

Condition C: They are of similar size or resource.

Where any of the above conditions are not met, then it is more likely that firms are imitating their better-informed peers (i.e. information-based theory). Following the methodology of Adhikari and Agrawal (2018), we test these three conditions by investigating (i) the product market competition, (ii) the information environment, and (ii) the firm characteristics by age, size and asset tangibility.

4.2.1 Product Market Competition

According to Lieberman and Asaba (2006), when the product market is high, firms are more likely to mimic for rivalry-based reasons. This is because when an industry has many players or more homogeneous products, competition becomes stiffer as product differentiation gets more difficult. As such, there is a greater need for firms to mimic dividend policies in order to signal their own quality to the capital market.

To evaluate the degree of product competition in the industry, we adopt two widely used measures: the Herfindahl-Hirschman index (HHI) and the Lerner index (LI). The Herfindahl-Hirschman index is calculated as a summation of the squares of the market shares of the firms in the industry, and its values can range from 0 to 10000 with larger index values indicating lesser competition. Panel A of Table VI Columns (13)-(16) shows the results of our analyses of the subsamples of firms that operate in more competitive (HHI < median) or less competitive (HHI < median) environments. The coefficients for the instrumented peer dividend policy variable in the 2SLS regressions are presented. It can be seen that the point estimates on the instrumented peer average policy variable is positive at 1% significance level among firms in less competitive industries. On the other hand, for firms in more competitive industries, the point estimate is not significant for the Dividend Payout variable, but significant for Div/Assets.

The Lerner index (Lerner, 1934), which defines a firm's market power by its price-cost margin, is our second measure of product market competition. To obtain the industry Lerner index, we follow Karuna (2007) by dividing total industry sales by the industry total operating expenses. The index can take a value from 0 to 1. The closer an industry is to perfect competition, the higher the product substitutability and hence the lower the price-cost margin and the index value. Columns (17)-(20) in Panel A of Table VI shows the results of our regressions on subsamples of firms in more or less competitive industries. For companies facing low product competition, the point estimates for both peer policy variables are positive at 1% significance level, while the point estimates for companies facing high product competition are not significant.

Overall, our results do not favour Condition A, and suggests that peer effects in corporate dividend policies are likely driven for information-based reasons.

4.2.2 Information Environment

Lieberman and Asaba (2006) found that information imperfection is a key driver of imitation among peers. In particular, they pointed out that firms operating in environments with higher information uncertainty tend to mimic their peers for information-based reasons. Because these firms have imperfect information on decision-making, they are more likely to actively learn from peers' decisions as they believe that peers' actions are conveying important information that guided their real decisions.

To measure the industry information environment, we use two measures: the dispersion in analysts' forecasts and the industry average analyst coverage. Analyst earnings forecasts often contain information about the private information set observed of the analysts (Barron and Stuerke, 1998; Barron et al., 1998). As such, the greater the uncertainty faced by the analysts about the firm's future economic performance, the higher the dispersion of forecasts. Following Zhang (2006), we calculate forecast dispersion for each company as the standard deviation of analyst forecasts scaled by the prior year-end stock price to mitigate heteroscedasticity. We then average that for all the firms in the industry to obtain the industry forecast dispersion. Panel B of Table VI Columns (21)-(24) show the results of our analyses on the subsamples of firms in industries with high and low information uncertainty. We can see that while the instrumented peer dividend policy variables are positive and significant drivers of corporate dividend policies of firms in both information environments, the point estimates are significantly higher for the companies operating under high information uncertainty. This appears to suggest that firms imitate their peers for information-based reasons.

Because analysts are collecting, analyzing and distributing information about a company's performance, therefore larger analyst coverage tends to correspond to more available information about the company, and hence less uncertainty. The second measure we use for estimating the industry information environment is therefore the industry average analyst coverage. This is calculated as the average monthly number of earnings estimates that firms in the industry receives over the fiscal year (Adhikari and Agrawal, 2018; Zhang, 2006). Columns (25)-(28) of Panel B in Table VI shows the results of the regressions on the subsamples. We can see that the coefficients of the instrumented peer dividend policy variables are positive and significant for firms operating in industries with low information uncertainty. However for companies operating under high information uncertainty, the coefficient for the instrumented peer variable is only significant for Dividend Payout, with the point estimate also being larger than that for companies under low information uncertainty.

Our results are less conclusive here. While our regressions under the first measure are more indicative of information-based theory driving peer influence, our regressions using industry analyst coverage is not as supportive.

4.2.3 Who is Being Mimicked? Dividend Policy Leaders and Followers Based on Size, Age and Asset Tangibility

Based on the rivalry-based theory, in order to maintain their competitive parity to peers, companies are more likely to imitate the payout policies of their peers who are similar to them in size, age and ease-of-valuation. The information-based theory, on the other hand, predicts that smaller, younger and harder-to-value companies are more likely to mimic the policies of their larger, older and easier-to-value peers. We therefore investigate this by partitioning the sample into three terciles by size, age and asset tangibility separately, and then constructing the peer average dividend policy variables as well as the instrumental variables for the both the top and bottom terciles. The 2SLS regression is then performed on the subsamples. The proxies for size, age and asset tangibility used here are total sales, firm age from date of incorporation and net tangible assets to total assets respectively.

Columns (29)-(32) of Panel C in Table VI show the results of the 2SLS regressions on the subsamples of firms partitioned by size against the instrumented policy variables of both their large and small peers. We can see that for both the larger and smaller firms, the coefficients of large peers' instrumented dividend policy variables are positive and significant at 1% level for both larger and smaller firms. Meanwhile, the coefficients of small peers' instrumented policy variables are only significant for larger firms and not for the smaller ones. We can also see that for the subsamples of larger and smaller firms, the point estimates of the large peers' instrumented policy variable are generally also bigger and more significant than that of the small peers' instrumented policy variable. Our results appear to point at the importance of large peers' dividend policies in influencing the policies of all firms in the industry, and this is likely done for information-based reasons.

Columns (33)-(36) show the results for companies partitioned by their age. We can see that the older peers' instrumented dividend policy variables are positive and significant drivers of the dividend policies of both older and younger firms. On the other hand, the coefficients of younger peers' instrumented policy variables are only significant for older firms and not for younger firms. With the exception of the Dividend Payout variable for older firms, the point estimates of the older peers' instrumented variables are generally also larger or more significant than that of the younger peers' instrumented variables. Our findings here are also in line with the prediction of the information-based theory.

Columns (37)-(40) show the results for firms subdivided by their net asset tangibility. While the instrumented Dividend Payout variable of less tangible peers is not a significant driver of the Dividend Payout of less tangible firms, the instrumented policy variables of both more and less tangible peers are positive and significant at 1% level for both more tangible and less tangible firms. For both subsamples, the point estimates of more tangible peers' instrumented policy variables are also all significantly larger than that of less tangible peers. This suggests that firms mimic their more tangible peers for information-based reasons.

Overall, our findings suggest that Taiwanese companies mimic the dividend policies of their peers for information-based reasons, with younger, smaller and harder-to-value companies more likely to imitate their older, larger and easier-to-value counterparts.

5. Conclusions

The Taiwanese market has been seeing a dramatic increase in payouts ratios and dividend-paying culture for some time. Over the last few years, the study of peer effects in corporate finance academia has also started to pick up. This paper therefore extends the study of peer effects to firm dividend policy in Taiwan. While studies of peer effects have historically been handicapped by the identification problem caused by the endogeneity in the regressor used, we overcome this issue by using the instrument variable technique. Our results show that the dividend policies of peers do influence the policies of companies significantly. In particular, we find that this peer influence is more prominent for firms operating in industries with lower product competition and higher information uncertainty. Smaller, younger and harder-to-value companies are also more likely to mimic the dividend policies of larger, older and easier-to-value firms. This is consistent with an information-based theory of imitation. Our findings therefore highlight the importance of understanding the payout policies of peer firms when evaluating corporate dividend policy.

References

Adhikari, B. and Agrawal, A., 2018. Peer Influence on Payout Policies. Journal of Corporate Finance 48(C), 615-37.

Allen, F. and Michaely, R., 2003. Payout policy in: Constantinides, G., Harris, M., and Stulz, R. (Eds.) Handbook of Economics and Finance, Elsevier – North Holland, Amsterdam, 337-429.

Baker, M. and Wurgler, J., 2004. A Catering Theory of Dividends. Journal of Finance 59, 1125-65.

Barron, O., Kim, O., Lim, S. and Stevens, D., 1998. Using Analysts' Forecasts to Measure Properties of Analysts' Information Environment. Accounting Review 73(4), 421-33.

Barron, O. and Stuerke, P., 1998. Dispersion in Analysts' Earnings Forecasts as a Measure of -Uncertainty. Journal of Accounting, Auditing and Finance 13, 245-70.

Brav, A, Graham, J., Harvey, C. and Michaely, R., 2005. Payout Policy In The 21st Century. Journal of Financial Economics 77, 483-527.

DeAngelo, H. and DeAngelo, L., 1990. Dividend Policy and Financial Distress: An Empirical Investigation of Troubled NYSE Firms, Journal of Finance 45, 1415-31.

DeAngelo, H., DeAngelo, L. and Skinner, D., 1992. Dividends and Losses, Journal of Finance 47, 1837-64.

Gaver, J. and Gaver, K., 1993. Additional Evidence on the Association Between the Investment Opportunity Set and Corporate Financing, Dividend, and Compensation Policies. Journal of Accounting and Economics 16(1-3), 125-60.

Grennan, J., 2019. Dividend Payments as a Response to Peer Influence. Journal of Financial Economics 131(3), 549-70.

Higgins, R., 1972. The Corporate Dividend Saving Decision. Journal of Financial and Quantitative Analysis 7(2), 1527-41.

Hoberg, G. and Prabhala, N., 2009. Disappearing Dividends, Catering, and Risk. Review of Financial Studies 22 (1), 79–116.

Hoxby, C., 2000. Peer Effects in the Classroom: Learning from Gender and Race Variation. National Bureau of Economic Research No. w7867.

Jensen, G, Solbery, D. and Zoun, T., 1992. Simultaneous Determination of Insider Ownership, Debt and Dividend Policies, Journal of Financial and Quantitative Analysis 27, 247-63.

Kallapur, S. and Trombley, M., 1999. The Association Between Investment Opportunity Set Proxies and Realized Growth. Journal of Business Finance and Accounting 26(3-4), 505-19.

Karuna, C., 2007. Industry Product Market Competition and Managerial Incentives. Journal of Accounting and Economics 43, 275-97.

Leary, M. and Roberts, M., 2014. Do Peer Firms Affect Corporate Financial Policy?. Journal of Finance 69 (1), 139–78.

Lee, K. F., 2011. Demographics, Dividend Clienteles and the Dividend Premium. Quarterly Review of Economics and Finance 51 (4), 368-75.

Lee, K.F., 2010. Retail Minority Shareholders and Corporate Reputation as Determinant of Dividend Policy in Australia. Pacific-Basin Finance Journal 18, 351-68.

Lerner, A., 1934. The Concept of Monopoly and the Measurement of Monopoly Power. Review of Economic Studies 1(3), 157-75.

Lieberman, M. and Asaba, S., 2006. Why Do Firms Imitate Each Other?. Academy of Management Review 31 (2), 366-85.

Lintner, J., 1956. Distribution of Incomes of Corporations Among Dividends, Retained Earnings, and Taxes. American Economic Review 46(2), 97-113.

Manski, C., 1993. Identification of Endogenous Social Effects: the Reflection Problem. Review of Economic Studies 60, 531-42.

Mas, A. and Moretti, E., 2009. Peers at Work. American Economic Review 99 (1), 112-45.

McCabe, G., 1979. The Empirical Relationship Between Investment and Financing: A New Look. Journal of Financial and Quantitative Analysis 14(1), 119-35.

Miller, M. and Scholes, M., 1978. Dividends and Taxes. Journal of Financial Economics 6, 333-64.

Modigliani, F. and Miller, M., 1961. Dividend Policy, Growth, and the Valuation of Shares. Journal of Business XXXIV, 235-64.

Zhang, F., 2006. Information Uncertainty and Stock Returns. Journal of Finance 61, 105-35.

Figure 1: Time Series Plot of Average Dividend Payout and Proportion of Dividend-Paying Firms in Taiwan

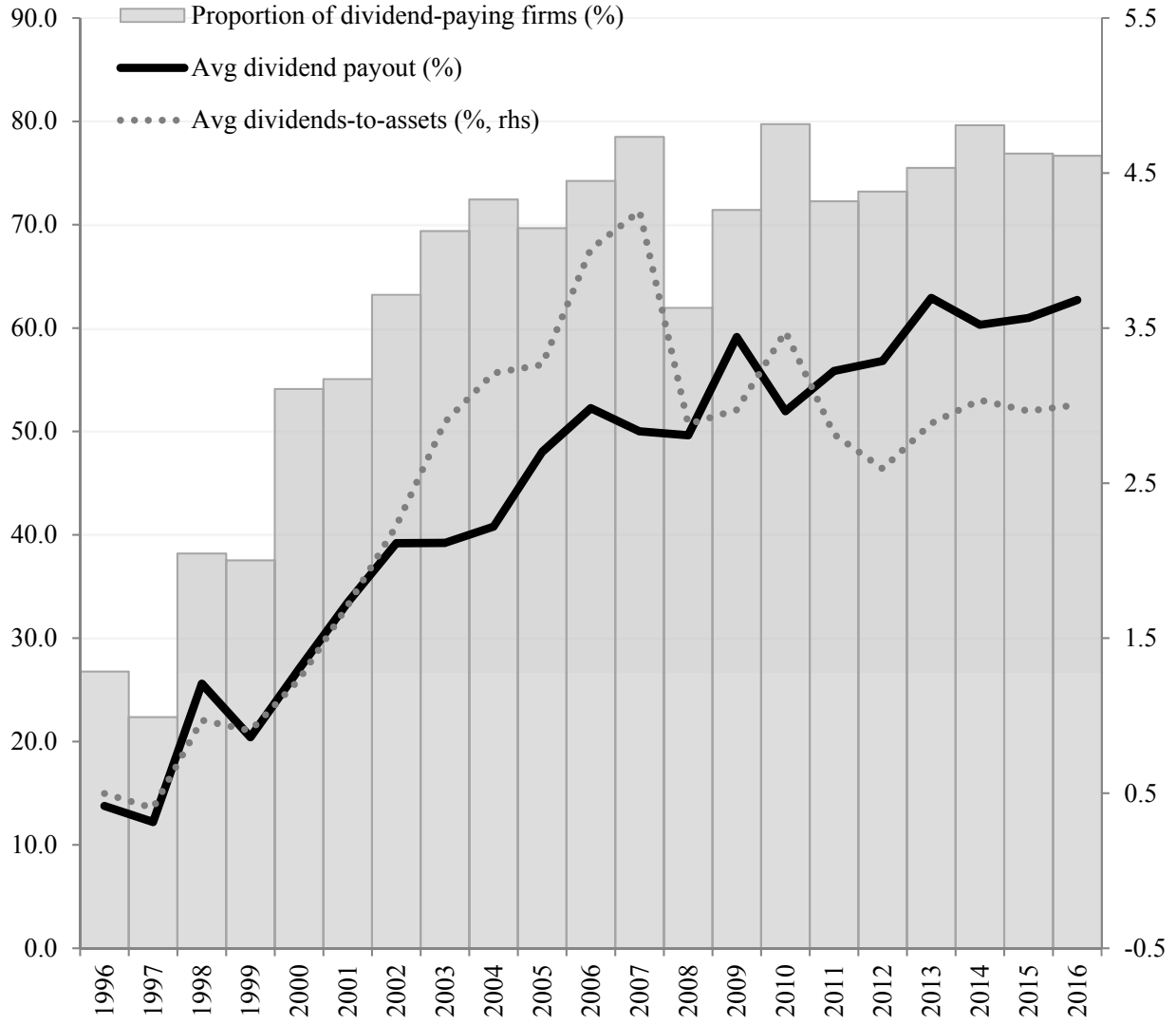

Figure 2: Distribution of Peer Firm Average Idiosyncratic Equity Risk

The sample consists of all the firms listed on the Taiwan Capitalization Weighted Stock (TAIEX) Index between 1995 and 2017 with non-missing data for all analysis variables. The figure shows the empirical distribution of the instrument variable, peer form average idiosyncratic annual equity risk. Peer firm averages are defined as the peer group average excluding the i^{th} observation.

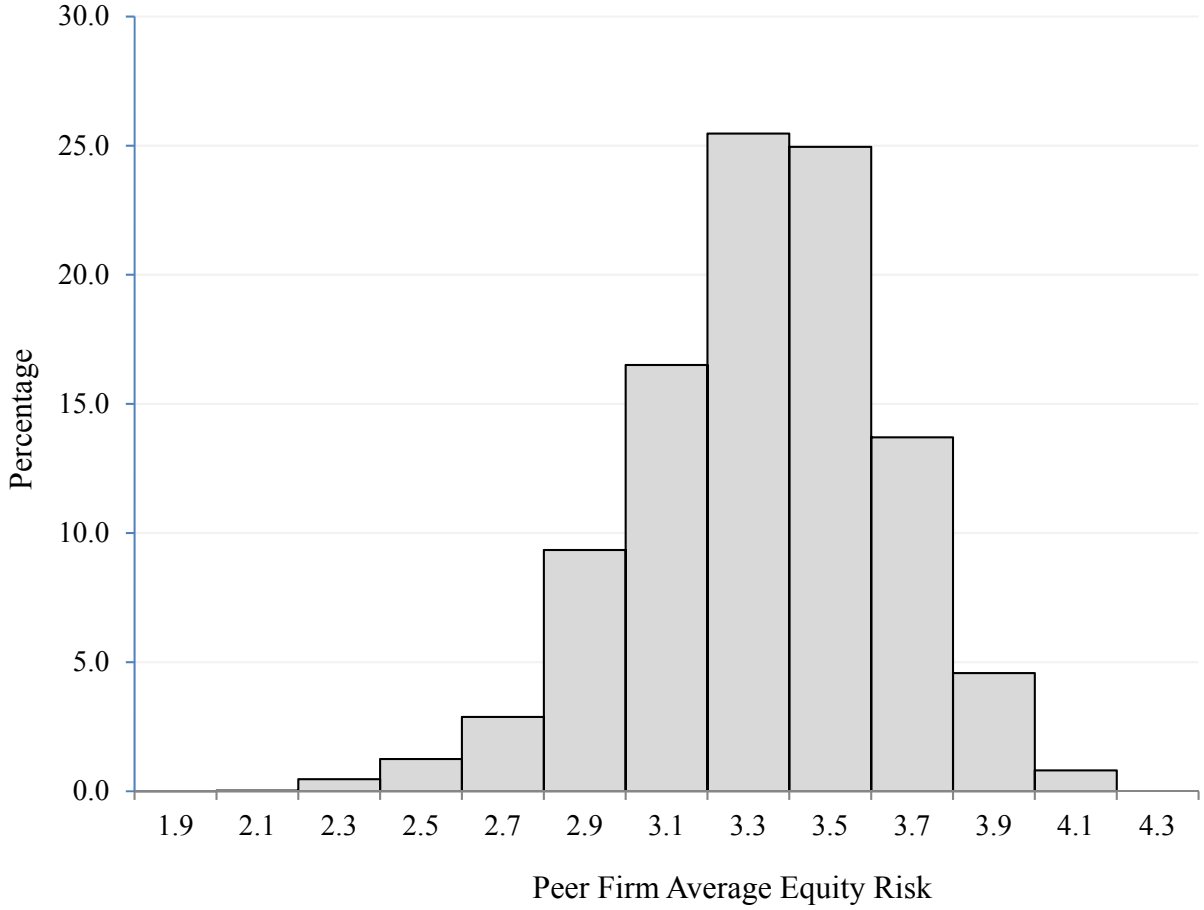

Table I: Stock Return Regression Results

The sample consists of monthly returns for all the firms listed on the Taiwan Capitalization Weighted Stock (TAIEX) Index between 1995 and 2017. The table presents the mean factor loadings and adjusted R^2s from the regression

$$R_{ijt} = \alpha_{ijt} + \beta_{ijt}^{Mkt} MKT_t + \beta_{ijt}^{IND}\left(\bar{R}_{-ijt} - RF_t\right) + \beta_{ijt}^{HML} HML_t + \beta_{ijt}^{SMB} SMB_t + \beta_{ijt}^{WML} WML_t$$

where R_{ijt} is the total return for firm *i* in industry *j* over month *t*, MKT_t is the excess return on the market, HML_t is the value factor, SMB_t is the size factor, WML_t is the momentum factor, and $\left(\bar{R}_{-ijt} - RF_t\right)$ is the excess return on an equal-weighted industry portfolio excluding firm *i*'s return, with industries being defined by the TWSE Stock Industry Category. The regression is estimated for each firm on a rolling monthly basis using historical monthly returns data from the Factset database. We require at least 24 months of historical data and use up to 60 months of data in the estimation. Expected monthly returns are computed using the estimated factor loadings and realized factor returns of the month. Idiosyncratic equity shock is computed as the difference between the realized and expected returns, while idiosyncratic equity risk is computed as the standard deviation of the monthly idiosyncratic equity shocks over the last 1 year.

	Mean	Median	Std dev
α_{it}	0.157	0.103	1.633
β_{it}^{Mkt}	0.246	0.229	0.683
β_{it}^{IND}	0.750	0.725	0.812
β_{it}^{HML}	-0.014	-0.017	0.210
β_{it}^{SMB}	0.144	0.076	0.814
β_{it}^{WML}	0.006	0.009	0.479
Adjusted R^2	0.435	0.452	0.192
No. of observations per regression	57	60	8
Realised monthly return	1.007	0.000	13.691
Expected monthly return	1.142	0.902	9.125
Idiosyncratic equity shock (monthly)	-0.043	-0.746	11.345
Idiosyncratic equity risk (monthly)	9.400	8.107	6.485

Table II: Summary Statistics

The sample consists of all the firms listed on the Taiwan Capitalization Weighted Stock (TAIEX) Index between 1995 and 2017 with non-missing data for all analysis variables. The table presents means, medians and standard deviations (std dev) for variables in levels and first-differences. Peer Firm Averages denote variables constructed as the average of all firms within an industry-year combination, excluding the i^{th} observation. Industries are defined by the TWSE Stock Industry Category. Firm-Specific Factors denote variables corresponding to firm *i*'s value in year *t*. All the variables have been winsorised at the 5th and 95th percentile level.

	Mean	Median	Std dev
Peer firm averages			
Dividend Payer	0.676	0.737	0.207
Dividend Payout	48.013	50.732	17.296
Dividends-to-Assets	2.671	2.881	1.503
Return on Assets	5.062	5.199	3.140
Asset Growth 1-year	6.603	6.032	10.885
Market Capitalisation	8.661	8.618	0.682
Long-term Debt to Equity	18.954	17.089	8.904
Idiosyncratic Equity Risk	3.163	3.238	0.391
Firm-specific factors			
Dividend Payer	0.674	1.000	0.469
Dividend Payout	48.619	50.761	33.694
Dividends-to-Assets	2.851	1.893	3.125
Return on Assets	5.058	4.532	7.236
Asset Growth 1-year	6.348	5.297	20.696
Market Capitalisation	8.645	8.548	1.367
Long-term Debt to Equity	19.082	8.712	24.159
Idiosyncratic Equity Risk	3.321	3.343	0.521
Industry characteristics			
No. of firms per industry-year	23.558	18.000	19.212
Total no. of industries	29		
Sample characteristics			
Total no. of observations	11892		
Total no. of firms	971		

Table III: Peer Effects in Dividend Policy: Structural Estimates

The sample consists of all the firms listed on the Taiwan Capitalization Weighted Stock (TAIEX) Index between 1995 and 2017 with non-missing data for all analysis variables. The table presents two-stage least squares (2SLS) estimated coefficients, with the t-statistics shown in parentheses. The dependent variable is indicated at the top of each column. The endogenous variable is the peer firm average of the dependent variable. The instrument is the one-year-lagged peer firm average idiosyncratic equity risk. Peer Firm Averages denote variables constructed as the average of all firms within an industry-year combination, excluding the i^{th} observation, and are lagged 1 year relative to the dependent variable. Industries are defined by the TWSE Stock Industry Category. Firm-Specific Factors denote variables corresponding to firm *i*'s value in year *t*. We also examine whether our instrument variable is appropriate through two tests: (1) instrument relevance using the F-test, and (2) exogeneity using the Hausman-Wu test. Statistical significance at the 10%, 5% and 1% levels are denoted by *, ** and *** respectively.

	Dividend Payer	**Dividend Payout**	**Dividends-to-Assets**
	(1)	(2)	(3)
Peer firm averages			
Dependent Variable	1.025*	0.926***	0.803***
	(1.848)	(5.473)	(5.821)
Return on Assets	-0.031	-0.772***	-0.229***
	(-1.433)	(-3.189)	(-6.115)
Asset Growth 1-year	0.000	0.308***	0.013**
	(-0.138)	(3.642)	(2.228)
Market Capitalisation	-0.075***	-3.787**	-0.355***
	(-4.154)	(-1.999)	(-3.197)
Long-term Debt to Equity	0.002*	0.140*	0.014**
	(1.870)	(1.751)	(2.268)
Firm-specific factors			
Idiosyncratic Equity Risk	-0.117***	-11.830***	-0.373***
	(-12.766)	(-16.980)	(-8.017)
Return on Assets	0.031***	0.596***	0.321***
	(49.040)	(9.789)	(88.873)
Asset Growth 1-year	0.001***	-0.205***	-0.015***
	(5.037)	(-10.678)	(-11.217)
Market Capitalisation	0.054***	3.185***	0.161***
	(15.790)	(10.905)	(8.819)
Long-term Debt to Equity	-0.002***	-0.230***	-0.019***
	(-12.683)	(-15.425)	(-20.642)
First-stage instrument			
Peer Firm Average Equity Risk	-0.059***	-8.901***	-0.347***
	(-16.888)	(-27.250)	(-12.972)
Industry Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Adjusted R-squared	0.423	0.201	0.631
Total no. of observations	11840	9681	8643
Instrument relevance: F-test	40.486***	121.52***	278.43***
Instrument exogeneity: Hausman-Wu test	1.275e+29***	1.034e+30***	7.910e+28***

Table IV: Robustness Checks

	Alternative control variables			*Alternative instrument variable*			*Alternative industry classification*		
	Dividend Payer	Dividend Payout	Dividends-to-Assets	Dividend Payer	Dividend Payout	Dividends-to-Assets	Dividend Payer	Dividend Payout	Dividends-to-Assets
	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Peer firm averages									
Dependent Variable	0.898***	0.518***	0.647***	1.046*	0.931***	0.804***	0.600***	0.600***	0.835**
	(3.126)	(2.619)	(3.398)	(1.887)	(5.496)	(5.824)	(4.712)	(3.318)	(2.453)
Return on Assets	-	-	-	-0.032	-0.774***	-0.229***	-0.015***	-1.021***	-0.251***
				(-1.470)	(-3.195)	(-6.116)	(-2.661)	(-2.613)	(-3.587)
Asset Growth 1-year	-	-	-	0.000	0.301***	0.013**	-0.003**	0.065	0.003
				(-0.220)	(3.557)	(2.191)	(-2.450)	(0.564)	(0.288)
Market Capitalisation	-	-	-	-0.074***	-3.648*	-0.349***	-0.035	-2.853	-0.042
				(-4.091)	(-1.924)	(-3.141)	(-1.580)	(-1.391)	(-0.245)
Long-term Debt to Equity	-	-	-	0.001*	0.137*	0.014**	0.000	-0.011	0.016
				(1.803)	(1.711)	(2.238)	(0.278)	(-0.087)	(0.910)
Return on Equity	-0.017***	0.030	-0.066***	-	-	-	-	-	-
	(-2.927)	(0.194)	(-4.414)						
Book-to-Equity	0.009	12.402***	1.305***	-	-	-	-	-	-
	(0.370)	(4.723)	(5.618)						
Total Sales	-0.073***	-6.808***	-0.199*	-	-	-	-	-	-
	(-4.402)	(-4.138)	(-1.677)						
Total Debt to Total Capital	0.003*	0.158	0.014	-	-	-	-	-	-
	(1.860)	(1.168)	(0.941)						
Firm-specific factors									
Idiosyncratic Equity Risk	-0.111***	-13.500***	-0.826***	-0.117***	-11.442***	-0.368***	-0.137***	-12.612***	-0.294***
	(-14.309)	(-19.305)	(-16.399)	(-12.970)	(-16.745)	(-8.019)	(-18.646)	(-18.126)	(-6.451)
Return on Assets	-	-	-	0.031***	0.586***	0.321***	0.032***	0.628***	0.323***
				(48.961)	(9.623)	(88.742)	(56.359)	(10.564)	(88.574)
Asset Growth 1-year	-	-	-	0.001***	-0.207***	-0.015***	0.001***	-0.193***	-0.015***
				(4.974)	(-10.786)	(-11.250)	(5.551)	(-10.052)	(-11.560)
Market Capitalisation	-	-	-	0.054***	3.276***	0.163***	0.053***	2.851***	0.176***
				(15.998)	(11.229)	(8.944)	(18.867)	(10.470)	(10.021)
Long-term Debt to Equity	-	-	-	-0.002***	-0.230***	-0.019***	-0.002***	-0.218***	-0.020***
				(-12.725)	(-15.443)	(-20.660)	(-13.923)	(-15.242)	(-22.318)
Return on Equity	0.020***	-0.375***	0.113***	-	-	-	-	-	-
	(67.950)	(-7.237)	(49.190)						
Book-to-Equity	-0.004	-11.749***	-1.908***	-	-	-	-	-	-
	(-0.509)	(-11.639)	(-28.114)						
Total Sales	0.027***	2.014***	-0.007	-	-	-	-	-	-
	(10.363)	(7.346)	(-0.400)						
Total Debt to Total Capital	-0.003***	-0.382***	-0.046***	-	-	-	-	-	-
	(-16.687)	(-21.276)	(-35.281)						
First-stage instrument									
Peer Firm Average Equity Risk	-0.028***	-8.745***	-4.062***	-0.068***	-10.060***	-0.435***	-0.131***	-16.630***	-0.860***
	(-9.280)	(-26.207)	(-15.743)	(-19.568)	(-31.180)	(-16.343)	(-31.456)	(-45.165)	(-33.964)
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.501	0.221	0.599	0.422	0.200	0.631	0.438	0.220	0.641
Total no. of observations	11892	9746	8575	11840	9681	8643	11462	9411	8416

Note: Statistical significance at the 10%, 5% and 1% levels are denoted by *, ** and *** respectively.

Table V: Dividend Policy by Peer Firm Equity Risk and Peer Firm Dividend Policy

The sample consists of all the firms listed on the Taiwan Capitalization Weighted Stock (TAIEX) Index between 1995 and 2017 with non-missing data for all analysis variables. The table presents average dividend payout for 25 groups of observations. The groups are formed by the intersection of quintiles based on: (1) peer firm average equity risk lagged 1 year and (2) peer firm average dividend payout. The column labeled "1 − 5" presents the difference in means between columns 1 and 5. The row labeled "1 − 5" presents the difference in means between rows 1 and 5. t-statistics robust to heteroskedasticity and within-firm dependence are in parentheses. Statistical significance at the 10%, 5% and 1% levels are denoted by *, ** and *** respectively.

Panel A

Lagged Peer Firm Avg Equity Risk	Peer Firm Average Dividend Payer Quintiles					
	1 (High)	2	3	4	5 (Low)	1 – 5
1 (High)	0.823***	0.700***	0.789***	0.630***	0.516***	0.307***
	(37.986)	(32.906)	(54.304)	(24.240)	(18.100)	
2	0.809***	0.741***	0.666***	0.713***	0.456***	0.353***
	(46.133)	(38.491)	(40.398)	(49.524)	(24.728)	
3	0.850***	0.822***	0.662***	0.629***	0.343***	0.508***
	(55.754)	(42.760)	(25.637)	(28.843)	(17.689)	
4	0.762***	0.810***	0.757***	0.632***	0.355***	0.407***
	(32.189)	(51.987)	(30.688)	(28.609)	(20.487)	
5 (Low)	0.851***	0.773***	0.789***	0.664***	0.419***	0.433***
	(80.404)	(53.244)	(50.751)	(32.064)	(15.440)	
1 - 5	-0.028	-0.074***	0.001	-0.034	0.098***	

Panel B

Lagged Peer Firm Avg Equity Risk	Peer Firm Average Dividend Payout Quintiles					
	1 (High)	2	3	4	5 (Low)	1 - 5
1 (High)	65.825***	61.459***	41.380***	43.431***	33.106***	32.718***
	(34.942)	(20.803)	(24.955)	(41.515)	(19.690)	
2	54.64***	60.126***	47.670***	41.885***	32.768***	21.871***
	(22.939)	(34.900)	(37.550)	(31.473)	(25.978)	
3	49.993***	60.542***	49.549***	43.742***	20.241***	29.752***
	(18.17)	(38.309)	(52.799)	(36.036)	(18.403)	
4	63.430***	62.318***	49.451***	34.682***	24.559***	38.871***
	(42.654)	(45.385)	(14.025)	(16.381)	(16.919)	
5 (Low)	63.582***	62.924***	52.864***	42.641***	36.386***	27.196***
	(70.386)	(67.74)	(35.049)	(18.1)	(9.291)	
1 - 5	2.243	-1.464	-11.484***	0.790	-3.280***	

Panel C

Lagged Peer Firm Avg Equity Risk	Peer Firm Average Dividends-to-Assets Quintiles					
	1 (High)	2	3	4	5 (Low)	1 - 5
1 (High)	0.034***	0.045***	0.025***	0.030***	0.011***	0.023***
	(19.679)	(23.599)	(19.059)	(10.650)	(8.732)	
2	0.042***	0.035***	0.031***	0.021***	0.01***	0.032***
	(23.784)	(19.087)	(19.155)	(14.971)	(7.041)	
3	0.049***	0.032***	0.030***	0.046***	0.006***	0.044***
	(25.415)	(14.548)	(14.852)	(9.429)	(6.600)	
4	0.036***	0.034***	0.031***	0.016***	0.009***	0.027***
	(14.591)	(22.356)	(24.109)	(17.395)	(12.288)	
5 (Low)	0.037***	0.035***	0.034***	0.019***	0.008***	0.029***
	(30.918)	(34.480)	(26.405)	(23.547)	(8.860)	
1 - 5	-0.003	0.009***	-0.009***	0.011***	0.003***	

Table VI: Heterogeneity in Peer Influence

This table presents two-stage least squares (2SLS) estimated coefficients, with the t-statistics shown in parentheses and the number of observations (N) in italics. The dependent variable is indicated at the top of each column. All models are estimated by linear 2SLS where the endogenous variable is the industry average dividend payout and the instrument is the one-period-lagged industry average idiosyncratic risk. Industries are defined by the TWSE Stock Industry Category. All specifications include one-period-lagged peer firm averages and firm-specific effects for the full set of control variables. Panel A focuses on the subsample of firms facing high or low product market competition, measured using the Herfindahl-Hirschman Index and the industry Lerner Index. The sample of firm-years with above (below) median measures within a year is defined as that with low (high) product competition. Panel B focuses on the subsample of firms facing high or low information uncertainty, measured by the industry average analyst coverage and the industry average dispersion in analysts' forecasts. The sample of firm-years with above (below) measures within a year is defined as that with low (high) information uncertainty. Panel C presents regressions for subsamples of larger, smaller, older, younger, more tangible and less tangible firms, partitioned into terciles based on the total sales, firm age and net asset tangibility. Statistical significance at the 10%, 5% and 1% levels are denoted by *, ** and *** respectively.

Panel A: Product market competition and payout mimicking

		Herfindahl-Hirschman Index				**Lerner Index**			
		High Product Competition		**Low Product Competition**		**High Product Competition**		**Low Product Competition**	
		Div Payout	Div/Assets	Div Payout	Div/Assets	Div Payout	Div/Assets	Div Payout	Div/Assets
		(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Instrumented Peer Div Policy Var		0.767	0.931***	0.936***	0.803***	1.640	0.675	0.957***	0.691***
		(0.838)	(3.009)	(5.890)	(3.491)	(1.396)	(0.737)	(4.771)	(4.483)
	N	*4703*	*4531*	*4978*	*4112*	*4211*	*4727*	*4432*	*4954*

Panel B: Information environment and payout mimicking

		Dispersion in Analysts' Forecasts				**Number of Analyst Coverage**			
		High Info Uncertainty		**Low Info Uncertainty**		**High Info Uncertainty**		**Low Info Uncertainty**	
		Div Payout	Div/Assets	Div Payout	Div/Assets	Div Payout	Div/Assets	Div Payout	Div/Assets
		(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)
Instrumented Peer Div Policy Var		1.183***	0.871***	0.785***	0.568***	0.985**	-0.048	0.946***	0.715***
		(5.123)	(4.522)	(3.036)	(3.06)	(2.469)	(-0.055)	(4.360)	(3.671)
	N	*4929*	*4221*	*4744*	*4394*	*5127*	*4234*	*4554*	*4407*

Panel C: Who is being mimicked? Payout leaders and followers based on size, age and asset tangibility

		Size				**Age**				**Ease-of-valuation**			
		Larger Firms		**Smaller Firms**		**Older Firms**		**Younger Firms**		**More Tangible Firms**		**Less Tangible Firms**	
		Div Payout	Div/Assets	Div Payout	Div/Assets	Div Payout	Div/Assets	Div Payout	Div/Assets	Div Payout	Div/Assets	Div Payout	Div/Assets
		(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)	(37)	(38)	(29)	(40)
Large Peers' Instrumented Div Var		0.849***	0.751***	2.552***	0.470**	-	-	-	-	-	-	-	-
		(2.679)	(4.315)	(3.162)	(2.016)	-	-	-	-	-	-	-	-
	N	*3920*	*3345*	*2477*	*2368*	-	-	-	-	-	-	-	-
Small Peers' Instrumented Div Var		0.371**	1.206***	0.736	1.059	-	-	-	-	-	-	-	-
		(2.514)	(3.564)	(1.535)	(0.81)	-	-	-	-	-	-	-	-
	N	*3882*	*3209*	*2419*	*2307*	-	-	-	-	-	-	-	-
Older Peers' Instrumented Div Var		-	-	-	-	1.081***	1.469***	0.488*	1.166**	-	-	-	-
		-	-	-	-	(5.102)	(3.574)	(1.874)	(2.242)	-	-	-	-
	N	-	-	-	-	*3575*	*2997*	*2571*	*2356*	-	-	-	-
Younger Peers' Instrumented Div Var		-	-	-	-	1.541***	1.303***	-0.890	1.465	-	-	-	-
		-	-	-	-	(4.485)	(3.133)	(-0.232)	(1.016)	-	-	-	-
	N	-	-	-	-	*3561*	*2996*	*2497*	*2336*	-	-	-	-
More Tangible Peers' Instrumented Div Var		-	-	-	-	-	-	-	-	1.063***	1.310***	0.649**	1.110***
		-	-	-	-	-	-	-	-	(3.512)	(3.703)	(2.056)	(2.719)
	N	-	-	-	-	-	-	-	-	*3196*	*2948*	*3025*	*2554*
Less Tangible Peers' Instrumented Div Var		-	-	-	-	-	-	-	-	0.937***	1.074***	0.413	0.975**
		-	-	-	-	-	-	-	-	(3.168)	(3.783)	(0.809)	(2.577)
	N	-	-	-	-	-	-	-	-	*3192*	*2960*	*2958*	*2520*

Appendix A: Variable definitions

This table describes the main variables used in the paper. Peer firm averages of variables are calculated as the average of all firms within an industry-year combination, excluding the ith observation. Industries are defined by the TWSE Stock Industry Category. All the variables have been winsorised at the 5th and 95th percentile level. All the data used in this paper is obtained from Factset and Bloomberg.

Variable	Definition
Dividend Payer	A firm is a payer in year t if it has positive dividends per share, and takes value of one. A firm is a non-payer and takes value of zero otherwise.
Dividend Payout	Dividends per share divided by Earnings per share
Dividends-to-Assets (or Div/Assets)	Total Cash Dividends paid to common shareholders divided by Total Assets
Return on Assets	Net Income divided by two fiscal period average of Total Assets
Return on Equity	Net Income divided by two fiscal period average of Total Shareholders' Equity
Asset Growth 1-year	One-year growth rate (in percentage terms) of Total Assets
Book-to-Equity	Book value divided by Equity value of company
Market Capitalisation	Logarithm of the Market Value which is calculated as Price multiplied by Common shares outstanding
Total Sales	Logarithm of Total Sales of Goods and Services earned from the company's core and recurring operations, reduced by cash and trade discounts, allowance for sales return and pass-through taxes such as sales and excise taxes.
Long-term Debt to Equity	Long-term Debt as a percent of Common Equity
Total Debt to Total Capital	Total Debt as a percent of Total Capital
Idiosyncratic Equity Risk	Residuals are first calculated from five-year rolling regressions of monthly stock returns on estimated loadings on Fama-French and Carhart factors and industry average excess returns. Logarithm of the standard deviation of the one-year residuals is then obtained.
Net Tangibility	Net Tangible Assets as a percent of Total Assets
Firm Age	Logarithm of the age of the firm from date of incorporation
Herfindahl-Hirschman Index	Calculated by squaring the market share of each firm competing in the industry and then summing the resulting numbers.
Industry Lerner Index	Total industry sales divided by industry total operational expenses.
Industry Average Analyst Coverage	Average monthly number of earnings estimates a firm in the industry receive over the fiscal year.
Industry Average Dispersion in Analysts' Forecasts	Calculated as the average of the standard deviation of analysts' earnings forecasts divided by the previous year share price for firms in the industry.
Repurchase yield	Total Funds used to decrease common and preferred stock outstanding divided by Total Market Value
Total Shareholder Return	Total Cash Dividends paid to common shareholders and Total Funds used to decrease common and preferred stock outstanding

Appendix B: Further Work on Share Buybacks and Dividend as Total Payout Policy

The main of this paper has deliberately not included share buybacks as part of its investigation for a few reasons. Firstly, stock repurchases were prohibited before 19 July 2000, while major restrictions were imposed on its use after the date. Secondly, when the Securities Exchange Act Rule 28-2 relaxed its prohibition on share buybacks, it explained that one of the reasons for doing so was to help companies attract and retain talented employees. However by the beginning of January 2008, the Taiwanese government had ruled that bonuses of employees are now to be treated as an expense. This is widely believed to have materially impacted companies' buyback decision. Thirdly, even today stock repurchase remains an infrequent payout policy tool used by companies, and only about 17% of our firm-year observations indicate share repurchases. While not within the scope of this paper and bearing in mind the caveats highlighted above, we present the results of some of the initial work that we have done investigating the influence of peers on the share repurchase policies of companies, as well as the proportion of dividends to total shareholder return in the table below. We find that peer influence is not a significant determinant of corporate buyback and total payout policies.

Table VI: Peer Effects in Buyback and Dividend Policy: Structural Estimates

The sample consists of all the firms listed on the Taiwan Capitalization Weighted Stock (TAIEX) Index between 1995 and 2017 with non-missing data for all analysis variables. The table presents two-stage least squares (2SLS) estimated coefficients, with the t-statistics shown in parentheses. The dependent variable is indicated at the top of each column. The endogenous variable is the peer firm average of the dependent variable. The instrument is the one-year-lagged peer firm average idiosyncratic equity risk. Peer Firm Averages denote variables constructed as the average of all firms within an industry-year combination, excluding the i^{th} observation, and are lagged 1 year relative to the dependent variable. Industries are defined by the TWSE Stock Industry Category. Firm-Specific Factors denote variables corresponding to firm i's value in year t. Statistical significance at the 10%, 5% and 1% levels are denoted by *, ** and *** respectively.

	Repurchase yield	**Dividends-to-Total Shareholder Return**
Peer firm averages		
Dependent Variable	1.912	0.788
	(1.361)	(0.899)
Return on Assets	-0.012	-0.006
	(-0.528)	(-0.545)
Asset Growth 1-year	0.007	-0.001
	(0.973)	(-0.730)
Market Capitalisation	0.019	-0.015
	(0.405)	(-0.535)
Long-term Debt to Equity	-0.002	0.001
	(-0.577)	(0.387)
Firm-specific factors		
Idiosyncratic Equity Risk	-0.032	-0.028***
	(-1.618)	(-3.920)
Return on Assets	0.000	0.016***
	(-0.060)	(22.796)
Asset Growth 1-year	-0.002***	0.002***
	(-6.133)	(7.751)
Market Capitalisation	-0.005	0.014***
	(-0.941)	(4.404)
Long-term Debt to Equity	-0.001**	-0.001***
	(-2.206)	(-5.027)
Industry Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Total no. of observations	10321	9681