

Impacts of Firm Internationalization, Corporate Governance, and Financial Performance on Dividend Policy. A Case Study of Taiwan Listed Firms

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Abstract

The capital market considers the corporate governance system when evaluating and investing in firms to cope with changes and challenges from firm internationalization. In response to the need for global economic development, Taiwan firms have enhanced their competitiveness to meet international standards and link with the world economy. A good corporate governance mechanism can bring good operating performance to a firm. The cash dividends declared each year reflects the operating status of the firm and explains its profitability and value each year, providing relevant and significant information for institutional and ordinary investors to make investment decisions. This study took Taiwan listed firms as the research object. Based on the annual data from 2005 to 2019 in the enterprise business database of the Taiwan Economic Journal, constructed a panel data regression model combining time-series and cross-sectional data. The aim was to empirically investigate and analyze the correlation of firm internationalization, corporate governance, and financial performance indicators with corporate cash dividend payouts. The findings showed that after the variables of firm internationalization, financial performance, and corporate governance were combined, the export ratio (a variable representing firm internationalization) positively impacted corporate dividend payouts. In other words, the higher degree of internationalization, the more cash dividends paid by the firm. In corporate governance, a firm with a higher shareholding ratio of financial institutions showed significantly more cash dividends. Regarding financial performance indicators, a firm with higher recurring earnings per share showed significantly fewer cash dividends.

Keywords: Internationalization, Corporate Governance, Financial Performance, Dividend Policy

JEL Classification: G32, G34, G35, G41

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1. Introduction

This study focused on Taiwan listed firms to investigate the impacts of the degree of firm internationalization, corporate governance factor, and financial performance indicators on the dividend policy. The cash dividends declared by a firm each year can explain the firm's profitability and reflect the operating status of the firm. As a firm's declaration of cash dividends may affect its stock price, capital structure, and corporate value, this move always concerns investors. The dividend policy involves the problem of capital allocation in a firm. If a firm's dividend payout ratio is extremely high, its internal funds may be insufficient. Excessive reliance on external funds may lead to problems, such as ownership transfer, higher financial risks, and lower future earnings. Therefore, the dividend policy is considerably significant and is a difficult problem that firms must tackle. This study explored the impacts of the internationalization degree, corporate governance factor, and financial performance indicators on the corporate dividend policy from 2005 to 2019, considering Taiwan listed firms as the research object. A regression model was constructed for further research and empirical analysis to understand the relationship between various variables and dividend policy.

The Organization for Economic Co-operation and Development (OECD) advocated corporate governance after the Asian financial crisis in 1997. Therefore, the OECD Principles of Corporate Governance, published in 1999, provide a reference for countries to establish corporate law frameworks and implement reforms and are generally recognized as international standards for good corporate governance. The six OECD Principles are as follows: 1) establishing the basis for an effective corporate governance framework; 2) the rights and equitable treatment of shareholders and key ownership functions; 3) institutional investors, stock markets, and other intermediaries; 4) the role of shareholders in corporate governance; 5) information disclosure and transparency; 6) responsibilities of the board of directors.

In its introduction to corporate governance in 2016, the Securities and Futures Bureau of the Taiwan Financial Supervisory Commission mentioned the following. “Corporate governance refers to a mechanism by which a firm is directed and governed to implement the responsibilities of firm managers and protect the legitimate rights and interests of shareholders and other stakeholders. Good corporate governance means that the board of directors and management of a firm accomplish operational goals considering the firm’s best interests and all shareholders. Further, they assist in the corporate management and operation and provide an effective supervision mechanism so that the firm can utilize resources, improve efficiency, enhance competitiveness, and promote the social well-being of all people.”

On February 13, 2020, the Taiwan Stock Exchange Corporation (TSEC) issued the Corporate Governance Best-Practice Principles for Taiwan Listed Companies (Taiwan Stock Governance No. 1090002299). The Principles are formulated to assist firms listed on the Taiwan Stock Exchange (TWSE) and the GreTai Securities Market (GTSM) in establishing a sound corporate governance system and promoting the integrity of the securities market. According to Article 2 of the Principles, “when setting up a corporate governance system, a TSEC/GTSM listed firm, in addition to complying with laws, regulations, articles of incorporation, contracts, and related regulatory matters signed with the TWSE or GTSM, should also follow the following principles: 1) protecting the rights and interests of shareholders; 2) strengthening the powers of the board of directors; 3) fulfilling the function of supervisors; 4) respecting the rights and interests of stakeholders; 5) enhancing information transparency.”

Under the changes and challenges of globalization, entering the global market has become the trend of firm operation and development. However, Taiwan’s economic development is closely related to the global economy and is vulnerable to the impact of global economic changes. To expand the business territory, firms focusing on international customers and the international market naturally respond more to the international emphasis on corporate governance and demand for information transparency. They have more incentives to actively adjust the corporate governance principles than firms focusing on Taiwan’s market. They are also motivated to engage in internal system innovation and improve the transparency of information disclosure. The international capital market has considered a corporate governance system when evaluating and investing so that firms can reach international standards to build their global competitiveness. Therefore, corporate governance in Taiwan actively and passively meets international standards.

2. Literature Review

We collected the theoretical and related empirical literature, including the theories of dividend policy, literature on firm internationalization, corporate governance, and the relevance of financial performance indicators to dividend policy. The aim was to explore the impacts of internationalization, corporate governance factor, and financial performance on corporate cash dividend payouts.

2.1 Relevance Theories of Dividend Policy

There are mainly two schools of thought on whether dividend policy affects firm value. Miller & Modigliani (1961) advocated the dividend irrelevance theory, which states that dividend policy does not affect firm value. However, Lintner (1956) and Gordon (1963) argued that the dividend policy affects firm value, which is the dividend relevance theory.

2.1.1 Dividend irrelevance theory

Miller & Modigliani (1961) argued that the value of a firm under a given investment and financing decision is determined by the firm's investment decision and profitability and is unaffected by the firm's earnings distribution (i.e., dividend policy). The dividend payout does not influence the capital cost and firm value, implying no optimal dividend policy. However, under the Client Effect Theory, firms set the optimal dividend policy based on their conditions. By announcing dividend policies, firms communicate their views on prospects. When a firm increases its dividend payout, its stock price usually rises; when it reduces its dividend payout, its stock price falls relatively. Therefore, the dividend policy implies the firm's information on the expected future earnings. Investors believe that the firm's past operating performance is not the main factor influencing the stock price, but its future profitability influences the stock price.

In an imperfect market with asymmetric information, a firm's dividend policy is a relatively reliable source of information and an important indicator for investors' references to make investment decisions. When a firm pays more dividends, it conveys a positive signal that the firm's future earnings will grow. Conversely, when a firm reduces dividends, the firm's future operating status is not optimistic and implies a negative signal that the firm's future operations will be poor.

2.1.2 Dividend relevance theory

Lintner (1956) and Gordon (1963) focused on investment psychology to explain the relationship between dividend policy and firm value. They found that when investors are risk-averse, they psychologically prefer dividend income that can be realized immediately. This is because there is greater uncertainty in the future capital gains that retain the current surplus, and a longer holding period leads to greater risks. Therefore, when a firm changes its dividend policy to reduce dividends, investors demand a higher rate of return as a risk premium for uncertainty. Thus, the dividend policy affects the stock price, and a firm that pays more cash dividends has a higher firm value. As the saying goes, a bird in the hand is worth two in the bush. This is also called the Bird-in-Hand Theory.

To maximize profits, investors will also consider corporate and personal taxes. Therefore, the dividend payout ratio affects investors' decision-making. Although the risk of capital gains is greater than that of dividends, the dividend tax rate is higher than that of capital gains. Therefore, investors seeking maximum after-tax profits prefer firms that pay less or no dividends. Firms with low dividend payouts retain more funds for future investment plans, and investors expect to earn capital gains when the stock price rises while saving on tax expenses. Thus, firms can increase the stock price and maximize the firm value only when they adopt a policy of low dividend payouts (Farrar & Selwyn, 1967).

Jensen & Meckling (1976) proposed the Agency Theory, which states that the control and ownership of firms are separated. The agency problem occurs when managers and shareholders pursue the maximization of their respective interests. To prevent the agent from violating the goal of maximizing shareholder interests, a firm tends to consider the agency cost when making dividend decisions. Under the constraints of agency cost, the agent may not be able to make the best decision, and the resulting opportunity costs also cause loss to shareholders. Easterbrook (1984) empirically concluded that agency costs could be effectively reduced by paying cash dividends. Jensen (1986) offered the free cash flow hypothesis. When a firm has a large cash flow, the most effective way to prevent the agent from wasting funds on unnecessary investment projects is to reduce the agent's discretionary cash resources. Therefore, paying dividends can help mitigate the agency problem arising from cash flow and substantially increase the firm value.

Baker & Wurgler (2004) proposed the Catering Theory (also known as the Catering Theory of Dividends). They attempted to study managers' motivation to pay dividends from the perspective of investor demand. They believed that firms' motivation to pay dividends stems

from managers rationally catering to investors' changing preferences for dividends, with the ultimate goal of increasing the firm's stock price. DeAngelo et al. (2006) extended the Life Cycle Theory to explain the dividend policy with the life cycle of a firm. Emerging firms are in the development stage and have many investment opportunities and growth potential. Such firms retain cash for further investment and pay lower cash dividends. However, mature firms with better profitability and more funds tend to pay higher cash dividends to avoid the agency problem.

2.2 Literature Review on Internationalization

Vernon (1966) proposed the product life cycle theory and explained from the technology perspective that different countries have their technological gaps. To respond to the differences among technologies, firms find the most suitable manufacturing location for products and engage in international trade. Reid (1983) believed that international trade manifests the market's tendency to internationalize; it is necessary to reduce the boundaries between countries in the trade of products and production factors and increase their liquidity.

Shaked (1986) and Kim & Lyn (1986) regarded a firm with foreign sales accounting for more than 20% of its total sales as an international firm. Daniels and Bracker (1989) used the proportion of a firm's foreign assets in its total assets as an indicator. Further, Lee & Kwok (1988) and Burgman (1996) defined a firm with its foreign tax accounting for more than 10% of its total tax as an international firm. Moreover, Hitt et al. (1997) showed that a firm engaging in any transnational operating activity—the sales, manufacturing, R&D, or other activities in overseas markets—can be called an international firm. Additionally, Aggarwal & Kyaw (2010), Ruigrok & Wagner (2003), and Geringer et al. (2000) used the export ratio to measure the degree of internationalization of firms.

Different research results have been obtained regarding the relationship between the degree of internationalization and the corporate dividend policy. Aggarwal & Kyaw (2010) found that firms with a higher internationalization degree in the United States pay more cash dividends. Further, Gill & Obradovich (2012) discussed the correlation of corporate governance and institutional investors with the dividend policy in the United States. They found that the size of the board of directors, CEO duality (the chairman concurrently serving as the general manager), and internationalization positively impact dividend payouts, while institutional investors negatively impact dividend payouts.

2.3 Empirical Literature Review on Corporate Governance

Corporate governance has become a trending topic, and the agency problem is a focus of discussion. A good corporate governance mechanism can effectively mitigate the agency problem. Dividend policy is regarded as a tool to mitigate the agency problem. Bhagat & Bolton (2008) proposed that separating CEO and chairman positions can lead to better corporate governance performance. When the chairman is also the general manager, the chairman plays the dual role of decision executor and supervisor simultaneously. Excessive power of the same person reduces the objectivity and supervision function of the board of directors, invalidating the balance mechanism and negatively impacting corporate performance. Nazar (2016) highlighted that separating the chairman and CEO positions can help improve the efficiency of management responsibilities and allow firms to achieve better performance. Moreover, Denis & Osobov (2008) studied dividend payouts in several developed countries (i.e., the United States, Canada, the United Kingdom, Germany, France, and Japan). They found that firms with a larger size and better profitability are willing to pay more dividends. They also supported the life cycle theory and believed that firms with better profitability pay higher cash dividends mainly because they expect to avoid the agency problem caused by abundant free funds.

Bokpin (2011) explored the impacts of corporate ownership structure and corporate governance on dividend policy and found that the foreign shareholding ratio and board size had a significant positive impact on dividend policy. Additionally, firms with high debt ratios exhibit a significant negative impact on dividend policy. Firms with higher debt ratios pay fewer dividends to fulfill several debt covenants. Furthermore, Ullah et al. (2012) studied the relationship between equity owners and dividend policy. They found that the managers' shareholding ratio significantly negatively impacts dividend policy, while the institutional and foreign shareholding ratios positively impact dividend policy.

Roy (2015) studied the impact of corporate governance on cash dividend policy in India, concluding that the proportions of board members and independent directors in the board of directors significantly positively impact the dividend policy. Large-scale directors can provide a better supervision mechanism, whereas independent directors are characterized by independence and professionalism—both help the firm considerably. Under a more efficient capital allocation, the two can enable the firm to have a better dividend policy. Moreover, the firm's growth opportunities have a significant positive impact on its dividend policy. By issuing high cash dividends, the firm communicates that it has better growth opportunities in the future, thereby attracting more investors.

2.4 Literature Review on Financial Performance

Financial statements show the operating results of a firm. Investors understand the operating performance through its financial statement disclosures and effectively and quickly grasp the operating status as a reference for economic decision-making. Rozeff (1982) proposed that when a firm's debt ratio is high, its funds are insufficient, and it must bear high financial pressure. To protect creditors' interests, the firm may specify the conditions for dividend payouts in the creditor's rights contract. Therefore, the dividend policy will be restricted, and the dividend payout ratio will be low. Further, Jensen (1986) believed that when a firm needs to raise funds by borrowing from banks or issuing promissory notes or corporate bonds, external units must strictly review investment plans and operating performance. Therefore, it is relatively difficult to obtain funds; thus, the dividend payout ratio is relatively low.

Rozeff (1982) and Jensen (1986) proposed that firms with higher financial leverage have restricted dividend policies; hence, the dividend payout ratio negatively correlates with financial leverage. D'souza & Saxena (1999) highlighted that when firms have more investment opportunities, they tend to reserve cash for future investment, thus reducing the dividend payouts. Moreover, Fama & French (2001) confirmed that a firm's future growth opportunities would affect corporate dividend payouts. When a firm has many growth opportunities, it needs to retain sufficient funds for future investment plans and is relatively less inclined to pay dividends. When a firm operates stably, its growth opportunities and investment plans are reduced. In this case, the firm is more willing to pay dividends to avoid idle funds and the agency problem. They also proposed that the firm size would affect the dividend policy. A larger firm is more inclined to pay cash dividends. When the size of a firm is larger, its development is more mature, and it holds more funds. However, its investment opportunities gradually decrease; therefore, the firm is more willing to pay cash dividends.

Rostami et al. (2016) found that among the corporate financial performance indicators, ownership concentration, board independence, CEO duality, and CEO tenure positively impact return on assets (ROA), while the shareholding ratio of legal entities and the size of the board of directors negatively impact ROA. Tulung & Ramdani (2016) state that the total ROA is an indicator used to measure the financial performance of firms. Aivazian et al. (2003) believe that firms with better profitability can pay dividends stably.

3. Research Method

3.1 Data Sources and Samples

The data were collected from the Taiwan Economic Journal (TEJ) database. This database provides basic analytical, corporate governance-related information and financial statement data in the Taiwan securities market.

As the data of the TEJ corporate governance database are relatively complete after 2005, we selected the years 2005–2019 (15 years) as the sampling years. All data were collected in the unit of years. The research object was Taiwan listed firms from 2005 to 2019. We excluded firms listed for less than one year and during the full settlement period because the financial information of these firms was incomplete. Foreign listed firms in Taiwan (i.e., F-share and TDR listed firms) were also excluded because their main business locations were not in Taiwan, and their information transparency was poor.

According to the above screening criteria, we obtained a total of 6,720 data samples after excluding the samples not included in the analysis and those with missing values.

3.2 Variable Definitions

3.2.1 Dependent variable

Dividend policy: The dividend policy was defined with reference to the methods of Chay & Suh (2009) and Benlemlih (2019). These researchers used the ratio of cash dividends to earnings before interest, tax and depreciation (EBITD) (Div_1), the ratio of cash dividends to net operating income (Div_2), and the ratio of cash dividends to total assets (Div_3) to measure the dividend policy. Rozeff (1982) measured the dividend policy using the dividend payout ratio (Div_4)—the ratio of cash dividends per share to earnings per share. If the dividend payout ratio of a firm is negative due to a loss, it cannot objectively reflect the actual dividend policy. Therefore, we used the ratio of cash dividends to EBITD (Div_1), which is more representative, as a substitution variable to measure the dividend policy.

3.2.2 Explanatory variables

Internationalization: Internationalization was defined with reference to the method of Attig et al. (2016); the export ratio (FS/S) was used as a substitution variable to measure the internationalization degree of a firm.

Corporate governance: Multiple variables were selected for the corporate governance factor. These included the following: the shareholding ratios of institutions outside Taiwan (Outinst), other legal entities outside Taiwan (Finshd), financial institutions in Taiwan (Finan),

managers (MO), major shareholders (MS), proportion of independent directors in the board of directors (KKI), duality (the chairman concurrently serving as the general manager, DUA), and information transparency (the information disclosure level ranked by the stock exchange, Inforank).

Financial performance: The ROA, net interest rate after tax (Netic), and recurring earnings per share (EPSRG) were used as variables to measure the profitability of a firm.

3.2.3 Control variables

Firm size: The firm size is measured by a firm's total assets. Therefore, we used the natural logarithm of the total assets (Size) to measure the firm size.

Investment opportunity: We used the revenue growth rate (Growth) to measure investment opportunities.

Financial leverage: We used the debt ratio (Debt) to measure the financial leverage.

We conducted empirical research using the correlation estimation model of the panel data regression model and constructed regression models for the above variables to find out the correlation and influence between explanatory and dependent variables.

3.3 Methods

This study investigated the impacts of the degree of internationalization, corporate governance factor, and financial performance indicators on dividend policy. The selected data included data of multiple firms in the same year (cross-sectional data) and data of the same firm spanning different years (time-series data). Thus, they were called panel data.

For the panel data regression model, one of the most common methods for estimating regression coefficients in the past was ordinary least squares (OLS), also known as the least-squares method. This method assumes that all samples have the same intercept, ignoring differences between samples. This can easily lead to heterogeneity bias in the results. The panel data model combines time-series and cross-sectional data analysis. In addition to the richness and variability of data types, the panel data model can also control the heterogeneity of individuals and mitigate the collinearity problems between variables by increasing the degree of freedom. Thus, researchers can obtain estimation results more efficiently and solve the estimate bias to improve the accuracy of the results.

Owing to the difference in the assumptions of the intercept, we chose the pooled regression (PR), fixed effect (FE), and random effect (RE) models for empirical analysis. Subsequently, we tested these models separately. In particular, a Hausman test was first performed to decide whether to choose a PR or RE model. Further, a Lagrange Multiplier (LM) test was performed to judge whether the model selected by the Hausman test was the most suitable.

3.3.1 Pooled regression model (PR)

In the hypothetical regression formula of the OLS method, it is considered that there is no difference between individuals, and different individuals have the same intercept. After all the data are combined, the OLS method is used to estimate a representative regression. The intercept and slope of this regression formula are fixed and do not vary with observed individuals or time— $\alpha_i = \alpha$, $\beta_k = \beta$. During the panel data analysis, heteroskedasticity bias occurs in the results if the parameters are assumed to be fixed to ignore the differences between individuals or periods.

3.3.2 Fixed effect model (FE)

This model assumes α_i to be fixed. It uses dummy variables to reflect the inter-individual differences in the intercept to measure the impact of unobserved variables on the model to understand the inter-individual differences and reduce the covariation of the model. Therefore, the FE model is called the Least Squared Dummy Variable Model (LSDV).

3.3.3 Random effect model (RE)

This model assumes α_i to be a random variable and uses the intercept of the random variable type to represent the different structures between each cross-section. This means that the unobservable heterogeneity effect is only generated randomly, and the expression is placed in the residual term. Therefore, the RE model is also called an error component model. The RE model focuses on the holistic relationship rather than inter-individual differences but still allows for inter-individual differences. This model asserts that inter-individual differences are random and do not change over time.

3.4 Model Testing Methods

The random model test (Hausman Test) proposed by Hausman (1978) and the LM test proposed by Breusch & Pagan (1980) can be used to test whether the OLS method, FE model, or RE model is suitable for the sample data.

3.4.1 FE model vs. RE model

Mundlak (1978) argued that if there is a correlation between the intercept and the explanatory variable of the RE model, bias will occur; in this case, an FE model should be selected. The RE model should be selected if the intercept has nothing to do with the explanatory variable. Hausman (1978) suggested using the Hausman test to determine whether an FE or RE model should be selected. The key is to check whether there is a correlation between the individual effect (α_i) and explanatory variable (X_{it}).

3.4.2 OLS model vs. RE model

Breusch & Pagan (1980) suggested using OLS to estimate the residuals of the regression model and using the LM test method to test whether the regression model has random effects.

4. Empirical Analysis and Discussions

We took Taiwan listed firms as the research object. The sample period spanned 15 years (2005–2019). We excluded firms listed for less than one year, those listed during the full delivery period, and foreign firms that had gone listed in Taiwan; we also deleted incomplete information. A total of 6,720 samples were collected. To ensure the correctness and stability of the regression model, we explained the results of the descriptive statistical and correlation analyses and performed a combinatorial analysis. Based on the results of the regression model, we selected the most suitable model to explore the impacts of internationalization degree, corporate governance factor composition, and financial performance indicators on the dividend policy of Taiwan listed firms.

4.1 Descriptive Statistical Analysis

There were 6,720 samples in this study. Table 1 shows the descriptive statistics of all variables, including the mean, median, standard deviation (SD), maximum value, and minimum value. Among financial performance indicators, the ROA of some sample firms was 86.47, which shows that some listed firms in Taiwan had excellent profitability. Regarding control variables, the maximum value of the firm size was 23.0324, while the minimum value was 9.7566; the maximum value was approximately 2.36 times greater than the minimum value. This indicates that the basic size of sample firms was larger than that of

Table 1 Descriptive Statistical Analysis

Variables	Sample Number	Mean	Median	Standard Deviation	Maximum	Minimum
Ratio of cash dividends to EBITD	6720	0.2667	0.2179	1.5194	72.7706	-43.5730
Ratio of cash dividends to net operating income	6720	0.0472	0.0226	0.1324	6.8977	0.0000
Ratio of cash dividends to total assets	6720	0.0296	0.0181	0.0366	0.3653	0.0000
Dividend payout ratio	6720	51.9260	49.1900	400.4424	31,704.6500	-3,700.1500
Return on total assets ratio	6720	9.2217	8.6550	9.1333	86.4700	-69.0300
Net profit margin after tax	6720	-7.5923	4.9300	863.4702	5,839.8200	-69,876.4700
Recurring earnings per share	6720	1.9726	1.2300	5.3472	210.6700	-19.9800
Natural logarithm of the total assets	6720	16.0001	15.7464	1.6106	23.0324	9.7566
Growth rate of operating income	6720	12.5236	4.1800	116.9663	5,813.8300	-99.6400
Debt ratio	6720	44.8345	44.3900	19.7227	99.7600	0.9000
Export ratio	6720	50.6013	57.5700	38.3397	100.0200	0.0000
Shareholding ratio of institutions outside Taiwan	6720	36.2456	28.1900	212.2070	72.4000	0.0000
Shareholding ratio of other legal entities outside Taiwan	6720	10.3493	4.9200	13.7174	100.0000	0.0000
Shareholding ratio of financial institutions in Taiwan	6720	2.3216	0.2500	4.3697	48.0100	0.0000
Shareholding ratio of managers	6720	1.1214	0.2900	2.3232	43.9900	0.0000
Shareholding ratio of major shareholders	6720	2.4882	0.0000	7.4608	79.0200	0.0000
Proportion of independent directors in the board of directors	6720	0.1736	0.2000	0.1713	0.7500	0.0000
Duality (the chairman concurrently serving as the general manager)	6720	0.2841	0.0000	0.4510	1.0000	0.0000
Information transparency	6720	4.3545	5.0000	1.1864	7.0000	1.0000

Source: Secondary data processing, 2022

ordinary firms, but there were differences in the size of sample firms. Regarding corporate governance, the average shareholding ratio of managers was only 1.1214, and the maximum value was 43.99. This showed that it was not popular in Taiwan to use equities as rewards for managers. The minimum shareholding ratio of legal entities outside Taiwan is 0, indicating that the major shareholders of the sample firms are only natural persons. Major shareholders refer to shareholders who simply hold a high proportion of shares but do not participate in the operation and control of the sample firms. The average shareholding ratio of major shareholders was 2.4882, and the maximum value was 79.02. This exactly shows that Taiwan firms have the characteristics of family business management. Regarding the characteristics of the board of directors, the average proportion of independent directors on the board of directors was only 0.1736, which was relatively low. Regarding the debt ratio, the mean value was 44.8345, which was appropriate. However, there was a maximum value of 99.76 in the debt ratio, showing that some firms had excessive debt and that their assets were insufficient to pay liabilities. There was also a minimum value of 0.9, which indicates that some listed firms had abundant assets.

4.2 Pearson Correlation Coefficient Analysis

Pearson's correlation coefficient analysis was performed to explore the strength of the correlation between variables. By checking the degree of correlation and collinearity, we can ensure that the empirical model will not reduce the reliability and accuracy of estimation results due to the high degree of correlation and collinearity when performing regression. Pearson's correlation coefficient took a range of values from -1 to 1, showing that the degree of correlation between two variables was between perfectly positive and perfectly negative. The correlation coefficient took the absolute value. The larger value, the higher correlation; the smaller value, the lower correlation. For example, if the value of the correlation coefficient is between 0 and 0.09, it indicates no correlation between the two variables. They have a weak correlation if their value is between 0.1 and 0.3, a moderate correlation for a value between 0.3 and 0.7, and a high correlation for a value between 0.7 and 1.

Table 2 shows that most correlation coefficients between the variables were below 0.3. The correlation coefficient between Div_2 and Div_3 was greater than 0.3, but the degree of their correlation was not large, which means that the two variables were not highly correlated.

The correlation coefficient between Div_3 and ROA reached 0.71, indicating a strong explanatory power between the two, and they exerted mutual influence. Further, the

correlation coefficient between ROA and EPSRG was 0.47, indicating a certain correlation and possible collinearity between them.

4.3 Combinatorial Analysis

We grouped the single variables in the sample from small to large and analyzed every variable to explore the relationship between each group and the dividend policy. The duality (the chairman concurrently serving as the general manager) was divided into two groups. Firms with the chairman not serving as the general manager were classified as Combination 1, while

those with the chairman concurrently serving as the general manager were classified as Combination 2. Information transparency (the information disclosure level ranked by the stock exchange) was analyzed based on the public information entered by listed firms in the Market Observation Post System of Taiwan and announced on the firm's website. Sampled firms were divided into seven groups (Groups 1 to 7), with their information transparency ranked A++, A+, A, A-, B, C, and C-, respectively.

Through the combinatorial analysis, we obtained the mean, median, standard deviation, maximum value, and minimum value of each group for every variable and performed t-tests and non-parametric tests. A t-test is a hypothesis test based on the mean of a single variable against the mother's mean. The closer the t-value is to 0, the less difference between the two. The farther the t-value is from 0, the greater the difference between the two. A non-parametric test is a statistical inference under the condition that the distribution of the population is unknown. It is mainly used to test whether the median of a single population is different to explore the statistical test method of abnormal distribution. The median test in the non-parametric statistic method is like the t-test used to test the means of independent samples in the parametric statistic method and usually uses Rank as the main statistic.

The relationship between a single variable and dividend policy is as follows. In terms of financial performance variables, the results of the ROA, after-tax net interest rate, and EPSRG were significant, within 1% in the t-test and non-parametric test. In terms of control variables, the results of firm size were significant at 1% in the t-test and non-parametric test, while those of investment opportunities and financial leverage were not significant in the t-test. Further,

the results of the export ratio, which represents the internationalization variable, were also significant at 1% in the t-test and non-parametric test among the corporate governance variables. The test results of information transparency were all insignificant, and those of duality were not significant in the t-test. For the shareholding ratio of institutions outside Taiwan, the t-test result was significant at 5%, and all other variables were significant at 1%.

4.4 Regression Analysis

Panel data often have the problem of heterogeneity. Owing to the differences in the assumptions of the intercept, we performed empirical analysis using the PR, FE, and RE models separately in the panel data regression model. Subsequently, we selected the most suitable model through the Hausman and LM tests. The empirical analysis and verification results of the model are as follows.

4.5 Impacts of Internationalization, Financial Performance, and Corporate Governance on Dividend Policy

4.5.1 PR Model

According to the test results of the variables of internationalization, financial performance, and corporate governance in Table 3, the p-value of the export ratio was significant at 1%, and the export ratio positively impacted the corporate dividend policy. Each unit of variation resulted in an enhancement of positive impact by 0.0062 units. The p-value of EPSRG was significant at 5%, and the negative impact of EPSRG on the corporate dividend policy was 0.0013 units less per unit of variation. The p-value for the shareholding ratio of financial institutions in Taiwan was significant at 1%. The shareholding ratio of financial institutions in Taiwan positively impacted the corporate dividend policy, and each unit of variation led to an enhancement of positive impact by 0.0240 units. The original coefficient of determination (R^2) was 0.93%. The adjusted coefficient of determination (R^2_{adj}) was 0.71%, indicating that the explanatory power of the variables of internationalization, financial performance, and corporate governance on the corporate dividend policy was 0.71% under the PR model.

Under the PR model, the export and shareholding ratios of financial institutions in Taiwan positively impacted the corporate dividend policy. The higher export ratio of a firm, the more cash dividends issued by the firm; the higher shareholding ratio of financial institutions in Taiwan, the more cash dividends issued by the firm. However, the EPSRG negatively impacted the dividend policy. The higher EPSRG, the less cash dividends.

4.5.2 FE Model

According to the test results of the variables of internationalization, financial performance, and corporate governance in Table 4, the p-value of the export ratio was significant at 5%.

The positive effect of the export ratio on the corporate dividend policy was 0.0080 units stronger per unit of variation. Further, the p-value for the shareholding ratio of financial institutions in Taiwan was significant at 10%, and each unit of variation in the shareholding ratio resulted in enhancing its positive impact on the corporate dividend policy by 0.0032 units. Regarding control variables, the p-value of the debt ratio was significant at 5%, and each unit of variation resulted in an enhancement of its negative impact on the corporate dividend policy by 0.0049 units. The F-statistic was 1.77, and the p-value was 0.0323, indicating that the variables of internationalization, financial performance, and corporate governance significantly affected the corporate dividend policy at the 5% level under the FE model.

We found that under the FE model, the export and shareholding ratios of financial institutions in Taiwan positively affected the corporate dividend policy. The higher degree of internationalization, the more cash dividends; the higher shareholding ratio, the more cash dividends; the higher debt ratio, the fewer cash dividends.

Table 3 Verification Results of Pooled Estimation Models - Internationalization, Corporate Governance, and Financial Performance

Explained variable	Dividend policy (Div_1)			
	Estimated coefficient	Standard error	T-test	P-value
Explanatory variables				
Internationalization				
Export ratio	0.0062***	0.0024	2.56	0.010
Firm size	-0.0017	0.0160	-0.11	0.914
Investment opportunity	-0.0001	0.0002	-0.82	0.409
Financial leverage	-0.0007	0.0011	-0.61	0.540
Corporate governance				
Shareholding ratio of institutions outside Taiwan				
	0.0000	0.0001	0.18	0.861
Shareholding ratio of other legal entities outside Taiwan				
	-0.0023	0.0016	-1.43	0.153
Shareholding ratio of financial institutions in Taiwan				
	0.0240***	0.0045	5.33	0.000
Shareholding ratio of managers	-0.0007	0.0082	-0.09	0.931

Shareholding ratio of major shareholders	-0.0023	0.0025	-0.92	0.356
Proportion of independent directors in the board of directors	0.1209	0.1125	1.07	0.283
Duality (the chairman concurrently serving as the general manager)	-0.0138	0.0419	-0.33	0.742
Information transparency	-0.0234	0.0156	-1.50	0.133
Financial performance				
Return on total assets ratio	0.0000	0.0000	0.25	0.801
Net profit margin after tax	0.0057	0.0040	1.43	0.153
EPSRG	-0.0013**	0.0005	-2.50	0.013
Intercept	0.3818	0.2468	1.55	0.122
R-squared = 0.0093				
Adj R-squared = 0.0071				

Note 1: *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Note 2: Div_1=Ratio of cash dividends to EBITD; EPSRG = recurring earnings per share.

Source: Author's Computation

Table 4 Test Results of Fixed Effect Model - Internationalization, Corporate Governance, and Financial Performance

Explained variable	Dividend policy (Div_1)			
	Estimated coefficient	Standard error	T-test	P-value
Internationalization				
Export ratio	0.0080**	0.0032	2.47	0.014
Firm size	0.0715	0.0527	1.36	0.175
Investment opportunity	-0.0001	0.0002	-0.36	0.716
Financial leverage	-0.0049**	0.0022	-2.18	0.029
Corporate governance				
Shareholding ratio of institutions outside Taiwan	0.0014	0.0024	0.61	0.542
Shareholding ratio of other legal entities outside Taiwan	-0.0019	0.0031	-0.61	0.542
Shareholding ratio of financial institutions in Taiwan	0.0018	0.0070	0.26	0.798
Shareholding ratio of managers	0.0015	0.0125	0.12	0.904

Shareholding ratio of major shareholders	-0.0012	0.0039	-0.31	0.760
Proportion of independent directors in the board of directors	0.2239	0.1644	1.36	0.173
Duality (the chairman concurrently serving as the general manager)	-0.0014	0.0630	-0.02	0.982
Information transparency	-0.0086	0.0159	-0.54	0.587
Financial performance				
Return on total assets ratio	0.0000	0.0000	0.13	0.896
Net profit margin after tax	0.0020	0.0053	0.39	0.700
EPSRG	0.0032*	0.0016	1.94	0.052
Intercept	-0.9342	0.8097	-1.15	0.249
F(15,5841) = 1.77				
Prob > F = 0.0323				

Note 1: *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Note 2: Div₁ = Ratio of cash dividends to EBITD; EPSRG = recurring earnings per share.

Source: Author's Computation

4.5.3 RE Model

According to the test results of the variables of internationalization, financial performance, and corporate governance in Table 5, the p-value of the export ratio was significant at 5%, and each unit of variation resulted in an enhancement of its positive impact on the corporate dividend policy by 0.0066 units. Further, The p-value of EPSRG was significant at 10%, and each unit of variation resulted in an enhancement of its negative impact on the corporate dividend policy by 0.0011 units. Moreover, the p-value for the shareholding ratio of financial institutions in Taiwan was significant at 1%, and each unit of variation resulted in an enhancement of its positive impact on the corporate dividend policy by 0.0202 units. The Wald statistic was 44.56, and the p-value was 0.0001, showing that the variables of internationalization, financial performance, and corporate governance had 0.01% explanatory power for the corporate dividend policy under the RE model.

Under the RE model, the export ratio positively impacted the shareholding ratio of financial institutions in Taiwan. The higher degree of internationalization, the more cash dividends; the higher shareholding ratio of financial institutions in Taiwan, the more cash dividends; the higher EPSRG, the fewer cash dividends.

4.5.4 Hausman Test

We followed the steps mentioned above to choose an empirical model for the internationalization, financial performance, and corporate governance variables. The first step is to perform the Hausman test to decide whether to use an RE or FE model. If the null hypothesis is not rejected, the RE model fits. If the null hypothesis is rejected, the FE model fits. Table 6 presents the Hausman test results of the internationalization degree model. The results show that the chi-square test was 36.72, and the p-value was 0.0008. The null hypothesis was rejected, and the FE model was more suitable for sample data.

4.5.6 LM Test

We followed the steps mentioned above to choose an empirical model for the internationalization, financial performance, and corporate governance variables. Subsequently, we performed an LM test to decide whether to use a PR or RE model. If the null hypothesis is not rejected, the PR model fits. If the null hypothesis is rejected, the RE model fits. Table 7 presents the LM test results of the internationalization degree model. The results show that the chi-square test was 135.75, and the p-value was 0. The null hypothesis was rejected, and the RE model was more suitable for sample data.

The Hausman and LM test results show that an FE model fitted after all variables of internationalization, financial performance, and corporate governance were combined.

Table 5 Test Results of Random Effect Model - Internationalization, Corporate Governance, and Financial Performance

Explained variable	Dividend policy (Div_1)			
	Estimated coefficient	Standard error	Z-test	P-value
Internationalization				
Export ratio	0.0066**	0.0026	2.55	0.011
Firm size	0.0088	0.0188	0.47	0.637
Investment opportunity	0.0001	0.0002	-0.70	0.487
Financial leverage	-0.0012	0.0013	-0.89	0.372
Corporate governance				
Shareholding ratio of institutions outside Taiwan	0.0000	0.0001	0.12	0.901
Shareholding ratio of other legal entities outside Taiwan	-0.0025	0.0018	-1.38	0.169
Shareholding ratio of financial	0.0202***	0.0050	4.07	0.000

institutions in Taiwan				
Shareholding ratio of managers	-0.0005	0.0090	-0.06	0.952
Shareholding ratio of major shareholders	-0.0020	0.0028	-0.73	0.463
Proportion of independent directors in the board of directors	0.1612	0.1214	1.33	0.184
Duality (the chairman concurrently serving as the general manager)	-0.0125	0.0461	-0.27	0.786
Information transparency	-0.0193	0.0154	-1.26	0.208
Financial performance				
Return on total assets ratio	0.0000	0.0000	0.17	0.863
Net profit margin after tax	0.0050	0.0043	1.16	0.245
EPSRG	-0.0011*	0.0006	-1.78	0.075
Intercept	0.2085	0.2878	0.72	0.469
Wald chi2(15) = 44.56				
Prob > chi2 = 0.0001				

Note 1: *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Note 2: Div_1 = Cash dividends/EBITD; EPSRG = recurring earnings per share.

Source: Author's Computation

Table 6 Hausman Test Result - Internationalization, Corporate Governance, and Financial Performance

	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
Variables	FE	RE	Difference	S.E.
Internationalization				
Export ratio	0.0080	0.0066	0.0014	0.0020
Firm size	0.0715	0.0088	0.0626	0.0492
Investment opportunity	-0.0001	-0.0001	0.0000	0.0001
Financial leverage	-0.0049	-0.0012	-0.0037	0.0018
Corporate governance				
Shareholding ratio of institutions outside Taiwan	0.0014	0.0000	0.0014	0.0024
Shareholding ratio of other legal entities outside Taiwan	-0.0019	-0.0025	0.0007	0.0025
Shareholding ratio of financial institutions in Taiwan	0.0018	0.0202	-0.0184	0.0049

Shareholding ratio of managers	0.0015	-0.0005	0.0020	0.0087
Shareholding ratio of major shareholders	-0.0012	-0.0020	0.0008	0.0028
Proportion of independent directors in the board of directors	0.2239	0.1612	0.0627	0.1109
Duality (the chairman concurrently serving as the general manager)	-0.0014	-0.0125	0.0111	0.0430
Information transparency	-0.0086	-0.0193	0.0107	0.0043
Financial performance				
Return on total assets ratio	0.0000	0.0000	0.0000	0.0000
Net profit margin after tax	0.0020	0.0050	-0.0030	0.0031
EPSRG	0.0032	-0.0011	0.0043	0.0015

b = consistent under Ho and Ha

B = inconsistent under Ha, efficient under Ho

Test: Ho: difference in coefficients not systematic

$$\chi^2(14) = (b-B)'[(V_b - V_B)^{-1}](b-B) = 36.72$$

$$\text{Prob} > \chi^2 = 0.0008$$

Source: Author's Computation

The results of the FE model show that the export ratio, which represents the internationalization degree, positively impacted corporate dividend payouts. The higher internationalization degree, the more cash dividends; the higher shareholding ratio of financial institutions in Taiwan, the more cash dividends; the higher EPSRG, the fewer cash dividends.

Table 7 LM Test Result - Internationalization, Corporate Governance, and Financial Performance

	Var	sd=sqrt(Var)
y	2.3087	1.5195
e	2.0853	1.4440
u	0.1689	0.4110

$$y[id,t] = Xb + u[id] + e[id,t]$$

$$\text{Test: Var}(u) = 0$$

$$\chi^2(01) = 113.75$$

Prob > chi2bar = 0.0000

Source: Author's Computation

4.6 Findings and Discussions

We found that under the PR model, the export ratio and shareholding ratios of financial institutions in Taiwan positively impacted the corporate dividend policy. The higher export ratio of a firm, the more cash dividends issued by the firm; the higher shareholding ratios of financial institutions in Taiwan, the more cash dividends issued by the firm. However, the EPSRG negatively impacted the dividend policy. The higher EPSRG, the fewer cash dividends. Under the FE model, the export ratio and EPSRG positively affected the corporate dividend policy. The higher export ratio, the more cash dividends; the higher EPSRG, the more cash dividends. However, the financial leverage negatively impacted the dividend policy. The higher financial leverage, the fewer cash dividends. Furthermore, under the RE model, the export ratio and shareholding ratio of financial institutions in Taiwan positively impacted the corporate dividend policy. The higher export ratio, the more cash dividends; the higher shareholding ratio of financial institutions in Taiwan, the more cash dividends. However, the EPSRG negatively impacted the dividend policy. The higher EPSRG, the fewer cash dividends.

The results significantly shown that the degree of internationalization has a positive impact on the distribution of company dividends, indicating that the higher degree of internationalization, the more cash dividends the company distributes. In Taiwan, large-scale high-tech industries have also mostly derived profits from export companies. The capabilities of Taiwan manufacturers have been recognized by the world, and their profits are also reflected in the distribution of cash dividends. In the corporate governance factor, most variables are not significant in the distribution of cash dividends, only shareholding ratio of financial institutions in Taiwan has a positive impact on the company's dividend policy. At the same time, the results show that most variables of financial performance indicators are not significant in the distribution of cash dividends, only EPSRG has impacts on the company's dividend policy. When the company's EPSRG is higher, the cash dividends issued are also higher under FE the model, but under PR model or RE model, EPSRG is negatively impacted the dividend policy.

When selecting the optimal model for the model verification method, the Hausman Test is performed for the Fixed Effect model and the Random Effect model, and the LM Test is performed for the Pooled Regression model and the Random Effect model. And the Pooled

Regression model and the Fixed Effect model can be tested in the further research, to determine the fitness of model choices.

5. Conclusions

This study explores the correlation of the internationalization degree, corporate governance factor, and financial performance indicators with the distribution of corporate cash dividends considering Taiwan listed firms as the research object. The sample period spanned 15 years (2005–2019). The panel data regression model was used for empirical analysis.

The regression analysis results of each model show that the internationalization model positively impacted corporate dividend payouts. In corporate governance, the FE model was selected as the most suitable model, but this model did not reach significance. The test results for the financial performance model show that ROA had a positive impact on corporate dividend payouts. Combining all the variables of internationalization, financial performance, and corporate governance show that the export ratio, which represents the internationalization degree, positively impacted corporate dividend payouts. The higher internationalization degree, the more cash dividends. In corporate governance, the higher shareholding ratio of financial institutions in Taiwan, the more cash dividends payout. Among financial performance indicators, firms with higher EPSRG paid fewer cash dividends.

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Table 2 Pearson Correlation Coefficient Analysis

	Div_1	Div_2	Div_3	Div_4	ROA	Netic	EPSRG	Size	Growth
Div_1	1								
Div_2	0.0597	1							

Div_3	0.1042	0.3337	1						
Div_4	0.0199	0.0247	0.0452	1					
ROA	0.0497	0.1933	0.7107	0.0229	1				
Netic	0.0042	0.0367	0.0211	0.0025	0.0371	1			
EPSRG	0.038	0.1231	0.4187	0.0129	0.4666	0.0133	1		
Size	0.0146	0.0684	-0.051	0.0031	0.0233	0.0283	0.1309	1	
Growth	-0.0082	-0.0133	0.0076	-0.0103	0.0701	0.01	0.0274	-0.0232	1
Debt	-0.0123	-0.1244	-0.3754	-0.0408	-0.2902	0.0159	-0.1001	0.445	0.0411
FS/S	-0.0226	-0.0802	0.106	0.0119	0.1366	0.0164	0.0979	-0.0926	-0.0304
Outinst	0.0044	0.0087	0.0269	-0.0012	0.0233	0.0011	0.0084	-0.0017	-0.002
Finshd	0.0006	0.0818	0.1833	0.0077	0.1919	0.0132	0.2555	0.492	0.0041
Finan	0.0719	0.1171	0.1068	0.0219	0.0937	0.012	0.0969	0.3275	-0.0186
MO	0.0001	-0.0225	0.0409	-0.0017	0.0527	0.0054	0.0208	-0.1888	-0.0006
MS	-0.0163	0.0059	-0.0438	-0.0117	-0.065	0.001	-0.0251	-0.0543	0.0347
KKI	0.0164	0.0372	0.1505	0.0299	0.121	-0.011	0.1013	-0.0215	-0.0125
DUA	-0.014	-0.0197	-0.0482	-0.0159	-0.0554	-0.0215	-0.061	-0.1431	0.0048
Inforank	-0.0188	-0.0079	-0.0138	-0.0085	-0.0096	0.0126	0.0027	-0.0111	-0.0035

Table 2 Pearson Correlation Coefficient Analysis (cont)

	Debt	FS/S	Outinst	Finshd	Finan	MO	MS	KKI	DUA	Info rank
Debt	1									
FS/S	-0.12	1								
Outinst	0.0118	-0.013	1							
Finshd	0.0669	0.0921	-0.0123	1						
Finan	0.1316	-0.0115	0.0034	0.1678	1					
MO	-0.0646	0.0403	0.01	-0.0919	-0.0524	1				
MS	0.0463	-0.0683	0.0133	-0.0337	-0.0605	-0.0141	1			
KKI	-0.0349	0.2337	0.0291	0.0917	0.0707	0.0886	-0.0087	1		
DUA	-0.058	0.0927	0.0008	-0.0535	-0.0848	0.1197	-0.022	0.0314	1	
Inforank	0.0058	0.0048	-0.009	-0.0128	0.0009	0.0016	0.003	-0.0207	0.0076	1

Note 2: The definitions of variables are as follows: Div_1 = cash dividend/EBITD; Div_2 = cash dividend/net operating income; Div_3 = cash dividend/total assets; Div_4 = dividend payout ratio; ROA = return on total assets rate; Netic = after-tax net profit margin; EPSRG =

recurring earnings per share; Size = natural logarithm of total assets; Growth = revenue growth rate; Debt = debt ratio; FS/S = export ratio; Outinst = shareholding ratio of institutional entities outside Taiwan; Finshd = shareholding ratio of other legal entities outside Taiwan; Finan = shareholding ratio of financial institutions in Taiwan; MO = shareholding ratio of managers; MS = shareholding ratio of major shareholders; KKI = proportion of independent directors in the board of directors; DUA = duality (the chairman concurrently serving as the general manager); Inforank = information transparency

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