

Stock Market Development and the Decline of the Portion of Dividend Payers throughout the World

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Abstract

I contend that stock market development has substantially contributed to the decline of dividend payers worldwide. Using data from 31 countries, my research shows that stock market development makes firms in countries with a relatively high dependence on stock market financing less likely to pay dividends, to pay less, and more likely to omit. These results also are robust to the sample selection, the time-varying firm characteristics, and the differences in legal systems, capital market scales, and country-level information disclosure.

Key words: Stock market development, Likelihood to pay, Payouts, Omission,
Dividends

JEL classification: G15, G32, G35,

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1. Introduction

According to Fama and French (2001), the proportion of U.S. firms that paid dividends between 1978 and 1999 dropped more than 45%; further, Denis and Osobov (2008) recognize the same phenomenon occurring around the world. They argue that one of the primary causes for the worldwide decline is a surge of new firms paying no dividends. If paying dividends is important for firms to obtain funds, how could there be a surge of such firms paying no dividends in stock markets throughout the world? Does the phenomenon imply that firms become less likely to pay, pay less, and more likely to omit dividends along with stock market development? By examining the relation between stock market development and dividend policy, I contend that stock market development explains the decline of the portion of dividend payers in recent decades and why such advancement prevails throughout the world.

Bank loans are generally the primary financing source in the early stage of an economy because they have less information asymmetry and agency problems than stock market financing (e.g. Stiglitz, 1985; Fama, 1985; and James, 1987). With economic development, stock market financing becomes more important as it can offer firms with a large scale of capital to address their increasing equity capital demands. It is argued that firms use dividends to solve information asymmetry and agency problems in stock market financing. According to the dividend signaling

theories (e.g. Bhattacharya, 1979; John and Williams, 1985; and Miller and Rock, 1985), dividend increases signal better prospects. Initially, this argument obtained empirical support (Aharony and Swary, 1980; Asquith and Mullins, 1983; and Nissim and Ziv, 2001). In recent years, there have been empirical studies finding no evidence that dividend changes predict firms' earnings growth (e.g. DeAngelo, DeAngelo, and Skinner, 1996; Grullon, Michaely, and Swaminathan, 2002, and Grullon, Michaely, Benartzi, and Thaler, 2006). The signaling function of dividends is now questionable.¹

According to agency theory (e.g. Easterbrook, 1984 and Jensen, 1986), profits may be diverted by managers for personal use or committed to unprofitable projects that provide private benefits for managers unless they are paid out as dividends. Studies show that firms' incentives in using dividends to solve agency problems are closely related to the legal environments in which the firms are located. La Porta, Lopez-de-Silanes, Shleifer, and Vishny, (2000a) show that higher shareholder rights are associated with higher dividend payouts. Brockman and Unlu (2009) find that firms with low creditor rights give lower dividend payouts. The law and finance view proposed by La Porta, Lopez-de-Silanes, Shleifer, and Vishny, (2000b) argues that distinguishing countries by the efficiency of their legal structure in supporting financial transactions is more useful than distinguishing countries by their financial

¹ A possible explanation for this change is that stock markets become more efficient during their development. Given the rise of institutional investors, day traders, etc., that information production by stock markets participants is high. This implies the reduction of signaling function for dividends.

structure. However, it is important to recognize that firms adjust their dividend policy because their financing demand changes along with their firm- and country-specific development. The legal structure is a relatively fixed factor while financing demand is a changing process. Stock market development is likely to be a reflection of the change of firms' financing demand. Therefore, it is expected to be more efficient in explaining the change of dividend policy in recent decades.

When firms are less likely to pay dividends for signaling and the legal structure is rather fixed, the characteristics of financing demand become important in determining firms' dividends. Since stock market financing is more costly and less flexible than bank loans, increasing reliance on financing from the stock market should give firms incentives to keep more slacks. As Bates, Kahle, and Stultz, (2009) show, U.S. firms are holding much more cash than they used to for the precautionary purpose. Therefore, I argue that stock market development should make firms less likely to pay, to pay less, and even more likely to omit dividend payments. Additionally, as stock market financing is increasing in importance worldwide, the decline of the portion of dividend payers is, therefore, an international phenomenon.

To test this argument, I first use the data provided by Beck and Al-Hssainy (2010) published in the World Bank database and the method proposed by Demirgüç and Levine (2001) to compile three indices for stock market development. I then

collect firm-level data from 31 countries for the period 1991 to 2008. In addition to firm characteristics, I also control investor desire for dividends, the difference in legal systems (creditor rights, shareholder rights, and legal origin), capital market scale, country-specific information disclosure level, and tax advantage to test the relation between dividend policy and stock market development. The empirical results show that firms in a country with a relatively important stock market over its banking sector are less likely to pay dividends, to pay less, and even more likely to omit dividend payments. I also check the impact of the incremental importance of stock market over the banking sector on dividend policy and obtain similar results. Further, I examine whether the findings are robust to firms with different ages. The empirical results show that increasing reliance of stock market financing not only makes new firms prefer entering as non-payers but also hinders old firms from becoming payers.

After obtaining the above results, I conduct several robustness checks. I first adjust dividends to the effect of net stock repurchases because what investors are concerned about may be the total payouts by firms rather than solely the cash dividends. This adjustment does not change the original results. Second, I check the disproportionate representation of countries by deleting the samples from the U.S., the U.K. and Japan or by using annual country-level means of firm-specific variables in regressions. All results are very similar. Finally, I use the annual decile ranks of

firm-specific variables (instead of the variable itself) to run regressions to avoid possible bias due to time-varying firm characteristics. The results are still similar.

The empirical results of my study contribute to several aspects of existing research related to dividend policy. First, my research shows that stock market development contributes to the global decline of the portion of payers. Although the decline is widely recognized, no rigorous discussion has been done to investigate why the decline is an international phenomenon. Second, it shows that stock market development is economically and statistically influential on firms' dividend policy despite the differences in the legal structure. In prior studies, the impact of financial structure on firms' dividend policy has received much less attention than that of the legal structure of an economy. Finally, the regression results suggest that increasing dependence on stock market financing causes not only a surge of those firms which paid no dividends, but also the deferment of existing firms to become dividend payers, which, in turn, causes a decline of the portion of dividend payers around the world.

2. Data and empirical models

2.1 Data

The data period is from 1991 to 2008.² Firm-level data of 31 countries are

² Because of the requirement for one lag for the regression, the actual data for the empirical test is from the period 1992 to 2008.

obtained from the Thomson Financial Worldscope database.³ The country-level variables are from various resources. Creditor and shareholder rights are from Djankov, McLiesh, and Shleifer, (2007) and Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2008). Legal origin is from La Porta, Lopez-de-Silanes, Shleifer, and Vishny, (1998). The data of financial market are from The World Bank. The country-specific development degree of the whole capital market is from Demirgüç and Levine (2001). Tax advantage of dividends over capital gains is derived from La Porta, Lopez-de-Silanes, Shleifer, and Vishny, (2000a).

From the original universe of the Worldscope database, I eliminate financial institutions (primary SIC codes from 6000 to 6999), state-owned institutions (primary SIC codes from 9000 to 9999), firms without required financial data, firms that do not present consolidated financial statements (i.e. excluding subsidiaries), and firms with observations less than five (for the purpose to calculate risk). The final sample contains 100,847 firm years representing 10,989 unique firms.⁴

2.2 The likelihood to pay or omit and the dividend payouts models

To check whether stock market development affects the likelihood to pay and to omit dividends, I use the following logitistic model:

³ The selection of countries is based on Pinkowitz, Stulz, and Williamson, (2006). All countries with mandatory dividends are excluded.

⁴ If the sample is trimmed at the 1% level by dropping 0.5% in each tail of a variable, the following regression results are very similar.

$$\begin{aligned}
\text{Prob}(\text{Payer}_{i,t} = 1 \text{ or } \text{Omission}_{i,t} = 1) = & \alpha_0 + \alpha_1 \text{Index}_{i,t} + \alpha_2 \text{Develop}_{i,t} + \alpha_3 \text{CR}_{i,t} \\
& + \alpha_4 \text{SR}_{i,t} + \alpha_5 \text{Law}_{i,t} + \alpha_6 \text{CIFAR}_{i,t} + \alpha_7 \text{Tax}_{i,t} + \alpha_8 \text{PR}_{i,t} + \alpha_9 \text{V}_{i,t} + \alpha_{10} \text{DA}_{i,t} \quad (1) \\
& + \alpha_{11} \text{E}_{i,t} + \alpha_{12} \text{RE}_{i,t} + \alpha_{13} \text{INS}_{i,t} + \alpha_{14} \text{Size}_{i,t} + \alpha_{15} \text{Lvg}_{i,t} + \alpha_{16} \text{Risk}_{i,t} + \varepsilon_{i,t}
\end{aligned}$$

For the likelihood to pay, payers takes the value of one if the firm paid a dividend in year t and zero otherwise. A firm is defined as omitting a dividend payment if it paid in the last year and does not pay in the current year. For the likelihood to omit, omission takes the value of one for the firm omitted and zero otherwise.

I use a Tobit model to check the impacts of the importance of stock market over the banking sector on dividend payouts. The model is similar to equation (1) except that the dependent variable is changed to dividend payouts, $D_{i,t}$ which equals dividends paid divided by total assets if a firm paid and 0 otherwise.⁵

In addition to the dependent variables, I include eight firm characteristic variables and eight country-specific variables in the above logistic and Tobit regressions. The eight country-specific variables comprise the index for the importance of the stock market over the banking sector: Index_i , creditor rights; CR_i , capital market size; Develop_i , shareholder rights; SR_i , legal origin; Law_i , tax advantage of dividends over capital gains; Tax_i , information disclosure, CIFAR_i , and dividend premiums, $\text{PR}_{i,t}$.

I construct three different indices. Following the criteria proposed by Demirgüç

⁵ Both total sales and total assets have been popularly used as denominators for dividends. The regression results for either definition are very similar. I report only the result of using total assets as the denominator to save space.

and Levine (2001), I calculate the indices as the average of total stock market capitalization/ bank assets, total stock market value traded/bank credit, and total stock market value traded/GDP * overhead costs/total assets of banks. I calculate index1 for the whole sample period, index2 respectively for the sub-periods 1992 to 1999 and 2000 to 2008, and index3 respectively for each year. $Develop_i$ is to measure the development degree of the capital market for an economy. The definition is based on Demirgüç and Levine (2001). It takes a value of one for developed countries and zero otherwise. This variable is included because it affects the importance of external finance and, thus, the incentive to pay dividends.⁶ CR_i is used to measure the legal power of creditors.⁷ SR_i is the anti-director rights for shareholders as suggested by La Porta, Lopez-de-Silanes, Shleifer, and Vishny (2000a).⁸ Law_i is a dummy variable and takes a value of one for a country with common law origin and 0 otherwise. The variables related with the legal structure are included to see whether financial structure still matters after taking into account of legal factors. Tax_i is used to measure tax advantage of dividends over capital gains. $PR_{i,t}$ is proposed by Baker and Wurgler (2004) and calculated as the difference in the logs of the average

⁶ For firms in a country without a well-developed capital market, external finance is not important. In this case, firms may not have incentives to pay dividends for signaling or solving agency problems even if the country has a relatively important stock market over its banking sector.

⁷ Creditor rights is an accumulation of four dummy variables corresponding to various aspects of control rights of creditors (Djankov, La Porta, Lopez-de-Silanes, and Shleifer, 2008)

⁸ This variable is an accumulation of six dummy variables corresponding to various aspects of control rights of shareholders (La Porta, Lopez-de-Silanes, Shleifer, and Vishny, 1998).

market-to-book ratios of dividend payers and non-payers. $CIFAR_i$ is used to measure the accounting disclosure of a country.⁹ I include the variable since signaling is argued to be an important function for dividends. The expected sign of the eight country-specific variables for the likelihood to pay and the payout ratio are $Index_i$ (-), $Develop_i$ (+), CR_i (+), SR_i (+/-),¹⁰ Law_i (+), Tax (+), $CIFAR_i$ (+/-),¹¹ and $PR_{i,t}$ (+). For the likelihood to omit, the expected signs are the opposite.

The eight firms' characteristics are profitability, earned capital, current assets growth, future growth opportunities, ownership concentration, firm size, operating risk, and leverage. Profitability, E_{it} , is defined as firm i 's net income before extraordinary items divided by total assets. Earned capital, RE_{it} , is defined as retained earnings divided by total assets. Assets growth, DA_{it} , is defined as the change of total assets. The market to book value ratio, V_{it} , is defined as the sum of the book value of debt and the market value of equity divided by total assets. These two variables are used as a proxy for the growth opportunities of a firm. The ownership concentration, INS_{it} , is defined as closely held shares divided by total common shares outstanding, which is a proxy for agency problem between insiders and outsiders. $Size_{it}$ is the log

⁹ It is created by Center for International Financial Analysis and Research (CIFAR). It represents a disclosure score based on the inclusion of 90 items as required disclosure in annual reports for each country. The CIFAR index can potentially take values between 0 and 100. It also is normalized by forming a variable that takes a value between 0 and 4 on quintiles of the distribution of CIFAR score.

¹⁰ According to La Porta, Lopez-de-Silanes, Shleifer, and Vishny, (2000a), the sign is positive for the outcome hypothesis and negative for the substitute hypothesis.

¹¹ The sign is uncertain. Better accounting disclosure can reduce the demand of dividends for signaling but also may reduce the flexibility of firms to retain internal cash flows.

of total assets. The standard deviation of E_{it} , $Risk_{it}$, is used to measure the operating risk of a firm. Leverage, Lvg_{it} , is measured as total debt divided by total assets. The predicted signs of the eight firm-specific variables for the likelihood to pay and the payout ratio are $E(+)$, $RE(+)$, $DA(-)$, $V(-)$, $INS(+/-)$,¹² $Size(+)$, $Risk(-)$, and $Lvg(-)$. For the likelihood to omit, the expected signs are the opposite.

In these regressions, I estimate intercept and slope coefficients from annual regressions allowing for clustering by country, then report averages of the annual coefficients and the corresponding Fama-MacBeth (1973) t -statistics for the mean coefficients. I use this method because it is good for addressing the clusters of observation across time.

3. Empirical results

3.1 Summary statistics

Panel A of table 1 shows the number of observations for each year. The number increases all the way from 1992 to 2005 but decreases in 2007 and 2008. This may be due to the financial crisis of 2007 and 2008. Panel B shows the distribution of observation around industries classified on two-digit SIC. The manufacturing industry represents the largest sample (42%) and the services industry the second (13%). Panel C gives the summary data for each country. Japan has the most observations, the U.S.

¹² The sign is uncertain because it is argued that there exists both the alignment effect and the entrenchment effect along with an increase in insider holdings (e.g. Morck, Shleifer, and Vishny 1998).

the second, and the U.K. the third. The observations have increased for all countries from the first sub-period (1992-1999) to the second sub-period (2000-2008). The portion of payers decreases for 26 countries, while Index2 increases for 27 countries from the first sub-period to the second sub-period. This gives a casual relation between payers and stock market development.

<Insert Table 1 here>

Panel A of Table 2 shows the comparison for dividend policy and Index2 over the two sub-periods. Index2 increases from 0.466 in the first sub-period to 0.867 in the second sub-period, while the portion of payers has decreased from 76.3% to 65.3%, and the portion of omission has increased from 3.3% to 3.6%. Although the average dividend payouts increase, the medians show that dividend payouts also decrease from the first sub-period to the second sub-period.¹³ The comparisons reinforce a negative relation between stock market development and the likelihood to pay (also the payout ratio) but a positive relation between stock market development and the likelihood to omit on a casual basis.

Since there is a big surge of sample firms in the second sub-period, I also classify firms into old and new firms. Old firms are defined as the firms which enter the sample before 2000 and new firms otherwise. Panel B shows that old firms have a

¹³ This result is consistent with the finding of DeAngelo, DeAngelo, and Skinner (2004).

larger portion of payers but a smaller portion of omissions. Old firms also show the characteristics of typical firms that paid dividends; they tend to be larger, have more earnings, have lower risk, and lower growth. Since the characteristics of these two groups of firms vary significantly, it is necessary to check the robustness of empirical results to the changing characteristics of the sample firms.

Using the data from the U.S., DeAngelo, DeAngelo, and Skinner (2004) give another explanation for the decline of the portion of payers. They argue that the concentration of dividend payer reflects increasing earnings concentration. I use Panel C of Table 2 to verify whether it is an international phenomenon. To compile the table, I include only the firms which enter the sample before 2000 (old firms) and are not delisted in the second sub-period. I first separate the sample into the two sub-periods and calculate the mean of profitability and dividend payouts for each firm. I define the firms with positive mean dividends in the first sub-period as payers and non-payers otherwise and compare the two groups across the two sub-periods. The result shows that the number of payers increases from 4,873 to 5,021 and that their payouts also increase from 0.0162 to 0.0170 in terms of mean and from 0.0084 to 0.009 in terms of median. On the other hand, their profitability decreases from 0.0517 to 0.0431 in terms of mean and from 0.0431 to 0.0379 in terms of median. Non-payers' profitability also worsens. There is no evidence of dividend concentration or earnings

concentration. The results also imply that profitability alone is not enough to explain the decline of the portion of dividend payers around the world.

<Insert Table 2 here>

Table 3 shows the Pearson correlation for country-level variables. Except for the correlations among the three indices, the correlations among other country-level variables are not high. The three indices have correlations with CR lower than 0.06 and with SR and Law no more than 0.3. Dindex3 (the change of Index3) has very low negative correlations with CR and SR and a positive correlation of 0.06 with Law. All these correlations indicate that it is not likely that the legal structure determines stock market development. I also check the Pearson correlation for firm-specific variables. The correlations among these variables are not high either (not tabulated).

<Insert Table 3 here>

3.2 Regression results for dividend policy

Table 4 shows the regression results for the likelihood to pay. All three indices have a negative coefficient significant at the level of 1%, consistent with the expectation that firms in an economy with higher reliance on stock market financing are less likely to pay. According to the regression results of using Index2, the likelihood to pay decreases by 0.114 due to the increase of index2 from 0.466 to

0.867.¹⁴ Comparing to the actual decrease of the portion of payers of 0.11 shown in Panel A of Table 2, the impact of stock market development is important. All the signs for the other control variables are as expected except for SR. SR has a negative sign which is different from the results of La Porta, Lopez-de-Silanes, Shleifer, and Vishny (2000a) but consistent with their substitute hypothesis.¹⁵

<Insert Table 4 here>

Panel A of Table 5 shows the regression result for dividend payouts. The results are very similar to those in Table 4. To save space, I report only the regression coefficients for the three indices. All three indices have a negative coefficient significant at the level of 1%. Firms pay lower dividends as the stock market develops. From the first sub-period to the second sub-period, stock market development decreases the payout ratio by 0.004.¹⁶ In comparison to the actual decrease of 0.001 shown in Panel A of Table 2, this amount demonstrates the importance of stock market development in explaining the decrease.

Panel B of Table 5 shows the regression results for the likelihood to omit dividend payments. To save space, I also report only the regression results for the three indices.

All three indices have positive coefficients and are significant for Index1 and Index2,

¹⁴ For the first sub-period, the likelihood to pay, in relation with stock market development, is negative $\exp^{0.662} / (1 + \exp^{0.662}) = 0.66$ (where $0.662 = 1.421 * 0.466$); for the second sub-period, the likelihood to pay is negative $\exp^{1.232} / (1 + \exp^{1.232}) = 0.774$ (where $1.232 = 1.421 * 0.867$); and $0.774 - 0.66 = 0.114$.

¹⁵ SR has been revised since their work.

¹⁶ This is obtained by $(0.867 - 0.466) * (0.0103)$.

indicating that stock market development contributes to the decrease of the portion of dividend payers once more. From the first sub-period to the second sub-period, stock market development increases the likelihood to omit by 0.058.¹⁷ In comparison to the actual increase of 0.004 shown in Panel A of Table 2, this amount once more demonstrates the significant impact of stock market development on the decline of the portion of dividend payers.

<Insert Table 5>

Since the development of stock markets is a continuous move, I also calculate Dindex3 (defined as the change of Index3) to proxy for the yearly change of the importance of a stock market over the banking sector and use Dindex3 in the above three regressions. The results are in Table 6. It has significant negative coefficients in the regression for the likelihood to pay and payouts and a positive coefficient in the regression for omission, although insignificant. Since Dindex3 has low correlations with all variables related with legal structure, these regression results reinforce the important impact of stock market development on the decline of dividends in addition to the impacts of legal variables.

<Insert Table 6 here>

4. Robustness analysis

¹⁷ For the first sub-period, the likelihood to omit contributed by stock market development is $(\exp^{0.282} / (1 + \exp^{0.282})) = 0.57$ (where $0.282 = 0.606 * 0.466$). For the second sub-period, the likelihood to omit contributed by stock market development is $\exp^{0.525} / (1 + \exp^{0.525}) = 0.628$ (where $0.525 = 0.606 * 0.867$).

4.1 Old firms vs. new firms

Since the surge of the firms with characteristics of having never paid dividends is suspected to be one of the key reasons in the decline of dividend payers, I check whether the aforementioned results are robust for both old firms and new firms by rerunning the above three equations, respectively, for the two groups of firms. The results are in Table 7. For brevity, I report only the regression results for the three indices.

Table 7 shows that the aforementioned regression results are robust for either old or new firms. The most notable difference is that the coefficient of Index3 for the likelihood to omit is significant for new firms but not for old firms, which gives weak evidence that old firms are less likely to omit than new firms. Thus, even though there is a change of firm type, stock market development has similar impacts on the dividend policy of old and new firms. It implies that increasing stock market financing defers old firms to become payers¹⁸ and makes new firms prefer entering as non-payers.¹⁹

<Insert Table 7 here>

4.2 Regression results for total payouts

¹⁸ At its early stage, a firm has to keep more internal funds for future growth. As the firm matures, this demand gradually diminishes since growth opportunities become fewer. At a certain point in time, the firm starts to pay dividends because internal funds are more than needed.

¹⁹ Instead of year 2000, I also redefine firms as “new firms,” if they enter into the sample after 1998 to take into account the surge of technology companies in the late 1990s. The results are very similar.

Investors may not care simply about only cash dividends, but also total payouts. In this subsection, total payouts are defined as the sum of cash dividends and net stock repurchases divided by total assets. Net stock repurchases are calculated as the change of treasury shares in year t times the average price of the beginning and the ending price of year t . Payers and Omissions are both adjusted accordingly.

Panel A of Table 8 reports the statistics of net repurchases. Because of missing data for treasury shares and stock prices, the sample is reduced to 80,718 firm-year observations. The amount of net repurchases represents around 13% of total payouts. Furthermore, payers account for 82% of the firms which undertake stock repurchases. These statistics indicate that stock repurchases are not likely to explain the decline of the portion of payers.

Panel B of Table 8 shows the regression results for the three equations. For brevity, I report only the results of the three indices. The results are very similar as the aforementioned ones.²⁰ Thus, the development of stock markets over the banking sector still makes firms less likely to pay, to pay less, and to become more likely to omit dividends, even when dividends are measured in terms of total payouts.

<Insert Table 8 here>

4.3 Regression results for testing the selection bias and time varying

²⁰ Fuller and Goldstein (2011) argue that dividends are more relevant in a declining market. When the data of 2008 is deleted, the three coefficients for dividend payouts are significant again.

characteristics of sample

I first address two sample selection issues: (1) the uneven distribution of observation among countries and (2) the occurrence of the subprime loan crisis during 2007 and 2008. To ensure that the above regression results are not dominated by countries with large observations, I run two different tests. First, I exclude firms in the U.S., the U.K., and Japan. This reduces the sample size by 52%. The results are very similar to the aforementioned ones (not tabulated). Second, I use annual country means of the firm-specific variables in the regressions. As suggested by Brockman and Unlu (2009), this method eliminates the disproportionate representation of countries and mitigates the potential problems from within-country correlated residuals. To avoid misrepresentation, I also delete the country year of less than 15 observations.²¹ The results are still very similar (not tabulated).

The events of the subprime crisis can contaminate results because of its serious impacts on all countries worldwide. I separate the regression into periods 1992- 2006 and 2007-2008. The results for the period 1992-2006 and year 2007 are very similar to the aforementioned results, while the results for year 2008 are inconsistent for the regression of payouts and omissions (not tabulated). However, the coefficients of year 2008 for these two regressions, generally, are insignificant, except for that of Index3

²¹ This deletes the sample by 0.4%.

in the regression of payout ratio. This difference also may be explained by the finding of Fuller and Goldstein (2011).

I also use the annual decile ranks of firm-specific variables (instead of the variable itself) to run regressions to avoid possible bias due to time-varying firm characteristics (not tabulated). The results are still very similar. Along with the regression results for old and new firms in section 4.1, these results indicate that my study's contention is robust to time-varying firm characteristics.

5. Conclusion

Why is there a global decline of the portion of dividend payers? I argue that stock market development around the world is an important factor in explaining this change. According to the signaling and agency theories, dividend payers should increase along with the growing reliance on stock market financing. However, previous studies show that signaling theories are not empirically supported, and that dividends paid to solve agency problems are determined primarily by the legal structure. Thus, the decline of the portion of dividend payers in recent decades is not likely to be explained by these two points. On the other hand, stock market financing has become much more important in the interim. Stock market financing is more costly and inflexible in comparison to bank loans. Hence, to explain the worldwide decline of the portion of payers in recent decades, I argue that stock market development matters.

By using data from 31 countries, I show that stock market development makes firms in countries with a relatively high dependence on stock market financing less likely to pay dividends, to pay less, and more likely to omit. My research uses three different indices for stock market development and one measure for the change of stock market importance. All measures obtain similar results. Furthermore, all regressions have controlled the differences in firm characteristics, investor desire for dividends, legal structure, capital market scale, and information disclosure level. The empirical results also are robust to the sample selection and the time-varying characteristics of firms. Hence, my study concludes that stock market development contributes to the decline of the portion of dividend payers throughout the world.

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Table 1

Summary statistics

The sample is from the Worldscope database, 1992-2008. D (payouts) is cash dividends/total assets; payer is a dummy, 1 if a firm pays in year t and 0 otherwise; and omission is a dummy, 1 if a firm paid in year t-1 but does not pay in year t and 0 otherwise. V is the sum of market value of equity and the book value of debt/total assets; E is net income before extraordinary items/total assets; Lvg is total debt/total assets; RE is retained earnings/total assets; Size is the logarithm of total assets; Risk is the standard deviation of E; and INS is the shares held by the insiders/total shares outstanding. Index1, Index2, index3 are calculated based on the criteria of Demirgüç and Levine (2001) and index1 is for the whole period, index2 respectively for the two sub-periods, index3 respectively for each year, and Dindex3 is the change of index3 from year t-1 to year t. Dindex3 is the change of Index3.

Panel A: Annual number of observations

Year	N	Year	N	Year	N	Year	N
1992	2874	1996	3852	2000	6934	2004	8710
1993	2977	1997	4387	2001	7775	2005	8942
1994	3187	1998	4821	2002	8378	2006	7842
1995	3555	1999	5950	2003	8541	2007	6639
						2008	5483

Panel B: Industry distribution

SIC industry definition	2 Digit SIC	N	SIC industry definition	2 Digit SIC	N
Agriculture, forestry and fisheries	<10	682	Transportation, communication	40-48	5185
Mineral industries	10-14	3204	Wholesale trade	50-51	8076
Construction industries	15-17	3950	Retail trade	52-59	6538
Manufacturing	20-39	42557	Services Industries	>=70	12785

Table 1 (continue)

Panel C: Country level data

	1992-1999					2000-2008				
	N	Payer	Payouts	Omission	Index2	N	Payer	Payouts	Omission	Index2
Argentina	119	0.689	0.018	0.096	0.255	278	0.291	0.010	0.086	0.656
Australia	581	0.816	0.031	0.027	0.434	3035	0.550	0.027	0.033	0.762
Austria	185	0.859	0.016	0.054	0.058	350	0.743	0.014	0.042	0.136
Belgium	65	0.631	0.018	0.023	0.138	338	0.680	0.027	0.020	0.361
Canada	806	0.619	0.014	0.021	0.385	2422	0.396	0.013	0.015	0.581
Denmark	303	0.805	0.012	0.025	0.486	564	0.677	0.021	0.042	0.266
Finland	380	0.837	0.019	0.026	0.408	719	0.821	0.039	0.050	1.544
France	1459	0.772	0.012	0.045	0.171	3236	0.650	0.013	0.044	0.620
Germany	1687	0.726	0.016	0.049	0.164	3192	0.523	0.013	0.060	0.365
Hong Kong	642	0.746	0.024	0.110	0.760	3214	0.547	0.020	0.056	1.252
India	25	0.800	0.023	0.000	0.581	475	0.789	0.020	0.039	1.081
Ireland	174	0.822	0.012	0.000	0.345	296	0.682	0.013	0.014	0.240
Italy	502	0.777	0.011	0.044	0.178	1224	0.670	0.014	0.058	0.456
Japan	11630	0.891	0.006	0.028	0.163	17828	0.857	0.007	0.026	0.469
Korea	256	0.789	0.004	0.120	0.557	2794	0.673	0.008	0.052	0.864
Malaysia	490	0.806	0.020	0.087	0.834	3588	0.678	0.017	0.050	0.537
Mexico	264	0.530	0.010	0.102	0.461	382	0.450	0.012	0.044	0.510
Netherland	73	0.562	0.016	0.000	0.352	537	0.734	0.022	0.024	0.647
New Zealand	104	0.923	0.056	0.013	0.201	355	0.772	0.047	0.016	0.145
Norway	99	0.475	0.013	0.014	0.232	477	0.547	0.021	0.050	0.429
Philippines	310	0.410	0.008	0.094	0.601	1035	0.365	0.011	0.045	0.452
Portugal	128	0.727	0.010	0.021	0.128	267	0.655	0.013	0.059	0.168
Singapore	276	0.812	0.012	0.070	0.748	2555	0.661	0.021	0.062	0.919
South Africa	376	0.880	0.026	0.023	0.938	1102	0.726	0.032	0.046	1.382
Spain	349	0.656	0.017	0.051	0.291	574	0.676	0.019	0.022	0.651
Sweden	550	0.775	0.018	0.040	0.885	1377	0.586	0.022	0.036	1.028
Switzerland	574	0.796	0.012	0.043	0.524	1028	0.750	0.016	0.049	1.126
Thailand	93	0.527	0.019	0.161	0.265	329	0.672	0.032	0.037	0.352
Turkey	246	0.809	0.041	0.064	0.534	1151	0.394	0.020	0.096	1.082
U.K.	3329	0.867	0.028	0.020	0.515	5921	0.703	0.021	0.030	0.704
U.S.	5528	0.472	0.010	0.018	1.169	8601	0.414	0.010	0.018	2.324

Table 2

Comparison analysis

D (payouts) is cash dividends/total assets; payer is a dummy, 1 if a firm pays in year t and 0 otherwise; and omission is a dummy, 1 if a firm paid in year t-1 but does not pay in year t and 0 otherwise. V is the sum of market value of equity and the book value of debt/total assets; DA is the change of total assets; E is net income before extraordinary items/total assets; Lvg is total debt/total assets; RE is retained earnings/total assets; Size is the logarithm of total assets; Risk is the standard deviation of E; and INS is the shares held by the insiders/total shares outstanding. Index2 is calculated based on the criteria of Demirgüç and Levine (2001) and separately for the two sub-periods. Old firms are defined as firms which appear in the sample before 2000 and new firms otherwise.

Panel A: Comparison of dividends and stock market index over Sub-periods

	Period	N	Payouts	Payer	Omission	Index2
Mean	1992-1999	31603	0.013	0.763	0.033	0.466
	2000-2008	69244	0.015	0.653	0.036	0.867
		<i>t</i> -value	-9.15	36.79	-2.46	-127.36
Median	1992-1999	31603	0.006	1	0	0.232
	2000-2008	69244	0.005	1	0	0.620
		Z-value	15.57	35.06	-2.41	-120.72

Panel B: Comparison of old and new firm-specific characteristics

Status	Payer	Omission	Payouts	Size	E	DA	V	INS	Risk	RE	Lvg
New	0.528	0.043	0.015	13.405	0.028	0.105	1.599	0.387	0.125	0.030	0.446
Old	0.733	0.034	0.014	14.728	0.040	0.054	1.499	0.341	0.066	0.161	0.530
<i>t</i> -value	-55.95	5.50	2.82	-56.57	-12.13	24.15	5.92	21.54	42.71	-55.00	-45.89
New	1	0	0.002	12.644	0.044	0.076	1.143	0.411	0.058	0.068	0.449
Old	1	0	0.006	14.637	0.041	0.037	1.153	0.341	0.036	0.154	0.540
Z-value	-58.77	5.88	-33.80	-59.58	-1.44	33.10	-3.33	20.48	59.95	-57.49	-49.09

Panel C: Comparison of dividend payers and non-payers for old firms over two sub-periods

Variable	Status	Sub-period	Firms	Mean	Median	Std
Payouts	Payer	1992-1999	4873	0.0162	0.0084	0.0261
		2000-2008	5021	0.0170	0.0090	0.0236
		<i>t</i> -value		-1.60	-1.79	
	Nonpayer	1992-1999	1417	0.0000	0.0000	0.0000
		2000-2008	1269	0.0000	0.0000	0.0000
		<i>t</i> -value				
E	Payer	1992-1999	4873	0.0517	0.0431	0.0584
		2000-2008	5021	0.0431	0.0379	0.0530
		<i>t</i> (Z)-value		7.73	8.53	
	Nonpayer	1992-1999	1417	0.0034	0.0277	0.1252
		2000-2008	1269	-0.0202	-0.0003	0.1376
		<i>t</i> (Z)-value		4.65	-7.74	

Table 3 Correlation matrix for country-level variables

Index1, Index2, index3 are calculated based on the criteria of Demirgüç and Levine (2001) and index1 is for the whole period, index2 respectively for the two sub-periods, and index3 respectively for each year. Dindex3 is the change of Index3. CR is a measure for creditor rights; SR is a measure for shareholder rights; Law is a dummy, 1 for common law origin and 0 otherwise; Develop is an index for capital market scale compiled by Demirgüç and Levine (2001); and CIFAR is a disclosure index calculated by the Center for International Financial analysis and Research.

	CR	SR	Develop	Law	CIFAR	Index1	Index2	Index3
SR	0.373	1						
Develop	0.402	0.030	1					
Law	0.382	0.563	0.213	1				
CIFAR	0.146	0.331	0.332	0.403	1			
Index1	0.033	0.275	0.018	0.292	0.318	1		
Index2	0.041	0.264	0.005	0.279	0.276	0.858	1	
Index3	0.065	0.253	0.024	0.301	0.296	0.728	0.857	1
Dindex3	-0.036	-0.020	0.047	0.059	0.072	0.196	0.192	0.400

Table 4

Regression results for the likelihood to pay

Dependent variable is payer, which is a dummy, 1 if a firm pays in year t and 0 otherwise. V is the sum of market value of equity and the book value of debt/total assets; DA is the change of total assets; E is net income before extraordinary items/total assets; Lvg is total debt/total assets; RE is retained earnings/total assets; $Size$ is the logarithm of total assets; $Risk$ is the standard deviation of E ; and INS is the shares held by the insiders/total shares outstanding. $Index1$, $Index2$, $index3$ are calculated based on the criteria of Demirgüç and Levine (2001) and $index1$ is for the whole period, $index2$ respectively for the two sub-periods, and $index3$ respectively for each year. $Develop$ is an index for capital market scale compiled by Demirgüç and Levine (2001); CR is a measure for creditor rights; SR is a measure for shareholder rights; Law is a dummy, 1 for common law origin and 0 otherwise; PR is dividend premiums defined as the difference in the logs of the average V of dividend payers and non-payers; $CIFAR$ is a disclosure index calculated by the Center for International Financial analysis and Research; and Tax is the tax advantage of dividends over capital gains.

	Model1		Model2		Model3	
	Coefficient	<i>t</i> -value	Coefficient	<i>t</i> -value	Coefficient	<i>t</i> -value
Intercept	-2.4859 ***	-5.37	-2.6607 ***	-7.35	-3.0689 ***	-9.33
Index1	-1.2735 ***	-9.26				
Index2			-1.4205 ***	-6.76		
Index3					-1.0068 ***	-6.87
Develop	0.3860 ***	3.93	0.2898 ***	3.72	0.3805 ***	4.27
CIFAR	0.4328 ***	8.82	0.4289 ***	9.74	0.4258 ***	8.55
CR	0.3968 ***	7.41	0.3312 ***	3.18	0.3788 ***	3.35
SR	-0.3975 ***	-8.71	-0.3485 ***	-9.62	-0.3115 ***	-5.15
Law	0.2965 **	2.39	0.1610	1.43	0.0096	0.07
Tax	-0.0469	-0.26	0.0927	0.34	0.1546	0.52
DA	-0.1048	-0.43	-0.1029	-0.59	-0.0367	-0.22
E	4.5280 ***	8.37	4.2721 ***	8.30	4.2080 ***	8.52
INS	0.3081 ***	5.69	0.2703 ***	4.33	0.2545 ***	3.86
PR	0.3702 ***	4.30	0.2036 **	2.32	0.3647 **	2.69
Size	0.2611 ***	8.57	0.2581 ***	8.15	0.2555 ***	7.97
V	-0.1050 ***	-4.51	-0.1141 ***	-5.44	-0.1218 ***	-6.25
RE	4.0379 ***	45.25	3.9896 ***	47.10	3.9077 ***	41.82
Lvg	0.0454	0.26	0.0825	0.63	0.0740	0.53
Risk	-4.2307 ***	-13.83	-3.8234 ***	-14.76	-3.9139 ***	-15.37
Pseudo R ²	0.447		0.464		0.465	
Industry	Yes		Yes		Yes	

***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.1 level respectively.

Table 5

Regression results for dividend payouts and the likelihood to omit

Dependent variable is D for panel A and Omission for panel B. D is defined as total cash dividends/total total assets. Omission is a dummy, 1 if a firm paid in year t-1 but does not pay in year t and 0 otherwise. Index1, Index2, index3 are calculated based on the criteria of Demirgüç and Levine (2001) and index1 is for the whole period, index2 respectively for the two sub-periods, and index3 respectively for each year. Develop is an index for capital market scale compiled by Demirgüç and Levine (2001); CR is a measure for creditor rights; SR is a measure for shareholder rights; Law is a dummy, 1 for common law origin and 0 otherwise; PR is dividend premiums defined as the difference in the logs of the average V of dividend payers and non-payers; CIFAR is a disclosure index calculated by the Center for International Financial analysis and Research; and Tax is the tax advantage of dividends over capital gains. Panel A: Dividend payouts

	Model 1		Model 2		Model 3	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Index1	-0.0084***	-4.96				
Index2			-0.0103***	-7.34		
Index3					-0.0048***	-2.89
Industry fixed	Yes		Yes		Yes	

Panel B: Likelihood to omit

	Model 1		Model 2		Model 3	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Index1	0.5839***	3.53				
Index2			0.6060**	2.46		
Index3					0.3329	1.22
Pseudo R ²	0.117		0.118		0.118	
Industry fixed	Yes		Yes		Yes	

***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.1 level respectively.

Table 6

Regression results for the change of Index3

Dindex3 is the change of index3 from year t-1 to year t. Index3 is calculated based on the criteria of Demirgüç and Levine (2001) for each year t. Payouts are cash dividends/total assets; payer is a dummy, 1 if a firm pays in year t and 0 otherwise; and omission is a dummy, 1 if a firm paid in year t-1 but does not pay in year t and 0 otherwise. V is the sum of market value of equity and the book value of debt/total assets; DA is the change of total assets; E is net income before extraordinary items/total assets; Lvg is total debt/total assets; RE is retained earnings/total assets; Size is the logarithm of total assets; Risk is the standard deviation of E; and INS is the shares held by the insiders/total shares outstanding. Develop is an index for capital market scale compiled by Demirgüç and Levine (2001); CR is a measure for creditor rights; SR is a measure for shareholder rights; Law is a dummy, 1 for common law origin and 0 otherwise; PR is dividend premiums defined as the difference in the logs of the average V of dividend payers and non-payers; CIFAR is a disclosure index calculated by the Center for International Financial analysis and Research; and Tax is the tax advantage of dividends over capital gains.

	Payers	t-value	Payouts	t-value	Omissions	t-value
Intercept	-2.0888	-1.06	-0.0349 ***	-2.90	-2.1189 ***	-5.08
Dindex3	-1.8419 ***	-2.96	-0.0142 *	-2.00	1.0157	0.98
Develop	0.6117 ***	4.40	0.0025 *	2.00	-0.4762	-1.69
CIFAR	0.4204 ***	7.67	0.0038 ***	7.73	-0.2042 ***	-3.01
CR	0.4836 ***	6.24	0.0049 ***	5.88	-0.0546	-0.91
SR	-0.2234 ***	-3.75	-0.0035 ***	-5.27	0.1557 **	2.24
Law	-0.4175 ***	-3.72	0.0012	0.87	-0.1711	-0.82
Tax	0.4887	1.51	0.0296 ***	8.13	0.2912	1.06
DA	0.4021	1.16	-0.0245 ***	-3.93	-1.1111 ***	-6.70
E	3.0409 **	2.68	0.1202 ***	5.30	-2.8035 ***	-5.56
INS	0.4625 *	1.72	0.0052 *	2.04	0.2305	1.61
PR	0.5380 ***	3.90	0.0066 ***	3.73	-0.0412	-0.15
Size	0.1538 **	2.20	0.0000	-0.01	-0.1147 ***	-6.77
V	-0.1735 ***	-2.95	0.0037 ***	4.17	-0.3253 ***	-4.15
RE	3.7209 ***	14.51	0.0349 ***	10.63	-0.4376 **	-2.45
Lvg	0.1849	1.47	0.0034 *	2.02	1.4151 ***	6.92
Risk	-3.8476 ***	-10.69	-0.0328 ***	-6.62	0.3109 *	1.76
Pseudo R ²	0.492				0.117	
Industry fixed	Yes		Yes		Yes	

***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.1 level respectively.

Table 7

Regression results for old and new firms

Index1, Index2, index3 are calculated based on the criteria of Demirgüç and Levine (2001) and index1 is for the whole period, index2 respectively for the two sub-periods, and index3 respectively for each year. Old firms are defined as firms which appear in the sample before 2000 and new firms otherwise. Payouts are cash dividends/total assets; payer is a dummy, 1 if a firm pays in year t and 0 otherwise; and omission is a dummy, 1 if a firm paid in year t-1 but does not pay in year t and 0 otherwise

Panel A: Regression results for old firms

	Coefficient	<i>p</i> -value	Coefficient	<i>p</i> -value	Coefficient	<i>p</i> -value
Payers:						
Index1	-1.4094***	-12.01				
Index2			-1.4360***	-6.88		
Index3					-1.0167***	-7.07
Payouts:						
Index1	-0.0085***	-6.03				
Index2			-0.0089***	-5.44		
Index3					-0.0046***	-3.30
Omissions:						
Index1	0.5482***	3.04				
Index2			0.5918**	2.31		
Index3					0.3179	1.13

Panel B: Regression results for new firms

	Coefficient	<i>p</i> -value	Coefficient	<i>p</i> -value	Coefficient	<i>p</i> -value
Payers:						
Index1	-1.1954***	-8.78				
Index2			-0.7378***	-7.42		
Index3					-0.6998***	-4.89
Payouts:						
Index1	-0.0165***	-5.03				
Index2			-0.0103***	-4.01		
Index3					-0.0101**	-2.97
Omissions:						
Index1	1.0127***	4.98				
Index2			0.5850**	3.18		
Index3					0.7786***	4.01

. ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.1 level respectively.

Table 8

Statistics and regression results for total payouts

Index1, Index2, index3 are calculated based on the criteria of Demirgüç and Levine (2001) and index1 is for the whole period, index2 respectively for the two sub-periods, and index3 respectively for each year. Payouts are cash dividends/total assets; total payouts are (cash dividends + net repurchases)/total assets; total payers are a dummy, 1 if total payouts are positive and 0 otherwise; and total omissions are a dummy, 1 if total payouts are positive in year t-1 but negative or zero in year t and 0 otherwise. Net repurchases are defined as the change of treasury shares in year t times the average stock price of the beginning and the end of year t, denominated by total assets. Payers are the firms which pay cash dividends at year t and non-payers otherwise.

Panel A: Statistics

	Mean	5%	25%	50%	75%	95%
Net repurchases	0.0022	-0.0008	0	0	0	0.0102
Total Payouts	0.0165	0	0	0.0067	0.0182	0.0631
Proportion of firms using repurchases:						
	N	Portion				
Payers	57972	0.2529				
Non-payers	22746	0.1441				

Panel B: Regression results

	Coefficient	<i>p</i> -value	Coefficient	<i>p</i> -value	Coefficient	<i>p</i> -value
Total payers:						
Index1	-0.9267***	-7.66				
Index2			-0.9628***	-5.30		
Index3					-0.7074***	-4.55
Total Payouts:						
Index1	-0.0053	-1.23				
Index2			-0.0023	-0.45		
Index3					-0.0045**	-2.47
Total Omissions:						
Index1	0.8753***	5.27				
Index2			0.9065***	4.13		
Index3					0.5148	1.29

***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.1 level respectively.