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Information asymmetry, agency costs, and payout policies: An international analysis of IFRS adoption and the global financial crisis

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ABSTRACT

Information asymmetry can affect the propensity of firms to pay dividends directly and indirectly by reducing the agency costs of free cash flow (FCF). However, designing a research framework to identify whether information asymmetry or agency cost directly explains the propensity to pay dividends is challenging, as both are partially endogenous. To overcome this challenge, this study investigates the role of two independent external shocks in explaining the propensity of firms to pay dividends. We use the mandatory adoption of International Financial Reporting Standards (IFRS) as an information asymmetry–reducing event and the global financial crisis (GFC) as an agency cost–reducing event to disentangle the effects of information asymmetry and agency costs. Using a large international sample of more than 100,000 firm-year observations and a matched sample of more than 35,000 observations, we find that the propensity to pay dividends declined after the mandatory adoption of IFRS and then declined further due to the economic shock of the GFC. We also provide evidence that firms facing high information asymmetry and high agency costs have a lower propensity to pay dividends because of the combined effects of IFRS adoption and the GFC. These findings suggest that the agency costs of FCF are more directly relevant in explaining dividend payout policy.

1. Introduction

In their seminal paper, Miller and Modigliani (1961) determined that, assuming frictionless and perfect capital markets and holding its investment policy fixed, a firm's choice of dividend payout policy is irrelevant. In contrast, in theories centered on free cash flows (FCF), dividend policy matters. The arguments are based on two fundamental economic principles: (1) information asymmetry between managers and investors and (2) agency costs of FCF related to equity and debt. When the financing environment is characterized by information asymmetry between managers and shareholders, this typically creates tension with respect to the firms' allocation of FCF. In line with the pecking order theory (Myers and Majluf, 1984), managers typically prefer to use internal cash flows and try to avoid external and costlier types of funds, such as debt or equity, for financing new projects. Assuming that the pecking order hypothesis holds and that managers' prefer to keep cash flows as retained earnings at the firm, this has a substantially

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negative effect on the level of dividends that can be distributed to shareholders. However, and in accordance with the signaling theory advanced by Ross (1977) and Bhattacharya (1979), managers are highly interested in clearly communicating their intention to avoid overinvestment in capital markets by paying dividends. In this case, dividend payments can act as a credible signal for this commitment (Ambarish et al., 1987; John and Williams, 1985; Miller and Rock, 1985; Williams, 1988). Moreover, given shareholder aversion to highly volatile income streams, certain investors might demand predictable and consistent dividend payouts, which may help firms to build a trustworthy reputation and minimize their funding costs in the future (Allen et al., 2000; Baker and Wurgler, 2004).

Decisions on the allocation of FCF might also reflect the concerns of shareholders and creditors because of agency costs and managerial entrenchment due to managerial misuse of FCF for their own benefit. This potential expropriation destroys shareholder wealth (Jensen, 1986). To reduce these agency costs, shareholders demand higher dividend payouts, preventing entrenched managers from pursuing self-serving goals.[1] Consequently, managers can increase dividends to mitigate the agency cost of equity or the misalignment of interests between corporate insiders and outside minority shareholders (Jensen, 1986; La Porta et al., 2000). Consistent with shareholders' interests, creditors faced with the agency cost of debt are also highly interested in receiving interest payments and principal repayments in full and on time. Therefore, they pressure managers, who may have an incentive to use debt to overinvest in very risky projects, to retain FCF. Thus, managers can mitigate the agency cost of debt by refraining from overinvestment and by limiting dividend payouts. Substantial empirical support is found for both agency cost theories behind FCF arguments. Easterbrook (1984) and La Porta et al. (2000) indicate that dividend payout policies help to mitigate the agency costs of equity, whereas Brockman and Unlu (2009) suggest that managers employ dividend policies to mitigate the agency costs of debt.

Hail et al. (2014) investigate the adjustment of dividend payout policies by firms due to the mandatory adoption of International Financial Reporting Standards (IFRS) from the perspective of the agency costs of FCF. In this case, IFRS adoption is viewed as an exogenous shock to the level of information asymmetry between managers and shareholders. Therefore, shareholder (subject to the agency costs of equity) demands for high dividend payouts decrease. Hail et al. (2014) report that the mandatory adoption of IFRS is associated with a decline in the propensity to pay dividends as shareholders are no longer concerned about being expropriated by managers. Alternatively, Hail et al. (2014) suggest that the mandatory adoption of IFRS, which is associated with a decline in the level of information asymmetry, could also have a positive effect on dividend payouts due to the shareholders' enhanced monitoring capabilities. Thus, the two mutually exclusive hypotheses by Hail et al. (2014) take the perspective of the agency cost of equity.

The FCF-based explanation by Hail et al. (2014), that the IFRS adoption leads to changes in dividend payouts, can be interpreted as an indirect information asymmetry effect, which works through agency costs, rather than its direct effect. Kalay (2014) argues that the direct effect of a decrease in the level of information asymmetry should lead to an increase in dividend payouts as the need for managers to retain FCF declines. He concludes that the precise effect of FCF-based theories based on either information asymmetry or agency costs on dividend policy is difficult to test empirically, as both are partially endogenous.

To date, the literature has been relatively silent on the question of whether one of these two theories is superior at explaining firms' payout policies. In this study, we design an empirical framework to identify which of these two theoretical approaches, information asymmetry or agency cost of FCF, best captures the changes in dividend payout policy. To do this, we explore IFRS adoption as an event that reduces information asymmetry and, then, the global financial crisis (GFC) of 2008–2009 as an event that reduces the agency costs of FCF. In sum, the goal of this study is to disentangle the agency cost effect on dividend payout policy from the information asymmetry effect by focusing on these two independent external shocks.

The combination of these two exogenous shocks, IFRS adoption and the GFC, provides an ideal setting for several reasons. First, the 2008–2009 financial crisis is viewed as an exogenous shock that led to a reduction in the agency costs of FCF. It sharply lowered firms' financing opportunities (Jang, 2017) by limiting access to bank loans and bond markets (Diamond and Rajan, 2009). Furthermore, firms' cash inflows declined during the financial crisis due to the reduction in economic activity (Campello et al., 2010). Consequently, given the severe decline in liquidity, managers had fewer opportunities for misusing cash flows, thus reducing the agency cost of FCF. Second, and more importantly, the GFC helps rule out alternative explanations of FCF-centric dividend payout theories based on IFRS adoption. A decrease in dividends subsequent to a shock that reduces information asymmetry to the life cycle of a firm. This holds especially for firms that have particularly high future growth opportunities and use dividends to signal profitable future investment projects. In this case, managers could reduce dividend payouts to use these FCF for financing valuable future investment opportunities and avoid high external funding costs. Because the GFC resulted in a sharp decline in firms' profit and investment (Duchin et al., 2010; Kahle and Stulz, 2013) as well as in the level of FCF, neither future investment opportunities nor information signaling are plausible explanations for any observed decrease in the firms' propensity to pay dividends.

In our empirical analysis we employ an international sample for the period 2000–2010 to estimate the propensity of firms to pay dividends. We exploit the mandatory IFRS adoption and the GFC as two exogenous shocks that affect information asymmetry and the agency costs of FCF, respectively. We also include the combined effects of these two external shocks to measure whether IFRS adoption has led to lower agency costs. A significant joint effect would disentangle the role of agency costs from that of information asymmetry. Our treatment group consists of all firms in countries that adopted IFRS, and a control group of firms that did not adopt IFRS. We do not include US firms in the control group because of many differences among closely held firms (outside the US) and widely held firms (in the US). La Porta et al. (2000) show that minority shareholder rights are important in the role of agency costs in

[1] Managerial entrenchment is an important concept in the context of dividends. Many papers have been produced on agency costs and managerial entrenchment and the use of dividend policy to restrict managers' entrenchment behavior. For a discussion and empirical evidence, see, e.g., Farinha (2003), Hu and Kumar (2004), Florackis and Ozkan (2009), Jo and Pan (2009).

determining payout policies around the world. Thus, the role of the agency costs of FCF are closely related to the ownership structure. Moreover, the previous literature indicates that agency issues tend to be more pronounced outside the US (Dyck and Zingales, 2004). Using this setting, we create a matched sample by pairing firms in IFRS-adopter countries with control firms in non-IFRS-adopter countries based on similar characteristics in 2005, which is the year of IFRS adoption. Our main research interest is in rigorously distinguishing agency cost explanations from information asymmetry explanations.

Empirical evidence for FCF-centric theories on dividend payout policies, for example, is presented in the literature with the life-cycle theory of a firm. DeAngelo et al. (2006) provides empirical evidence suggesting that firms are more willing to distribute FCFs in the form of dividends when retained earnings already represent a high proportion of total equity. In line with the life-cycle theory, firms have a higher propensity to retain FCFs in their early stages, when their growth rate and investment opportunities are high and only start paying dividends when they become more mature and well established. Consequently, changes in the volume and patterns of dividends typically depend on the maturity or age of the firm (Brockman and Unlu, 2011; Fama and French, 2001; Grullon et al., 2002). Young growth firms with substantial positive net present value investment opportunities are less willing or able to distribute FCF in the form of dividends, whereas mature and more established firms with higher retained earnings are in a better position to maintain steady cash payouts to shareholders.

In additional analyses, we use specific firm characteristics to test the relevance of information asymmetry and agency cost explanations across the life cycle of a firm. For this analysis, we create two groups: (1) firms with high information asymmetry, which we define as small firms with high growth opportunities, and (2) firms with high agency costs, which we define as mature firms with high cash holdings. Our goal is to examine whether our main findings hold for firms with high information asymmetry and high agency costs during IFRS adoption and the GFC, separately or in combination.

Using the full sample as well as matched pairs in IFRS and non-IFRS countries, we observe that the firm's propensity to pay dividends declines subsequent to the mandatory adoption of IFRS and during the GFC. The latter supports the perspective that the agency cost of FCF declined. Most important, the combined effect of IFRS adoption and the GFC leads to an additional decrease in the propensity to pay dividends. These results strongly suggest that the agency cost of the FCF effect is more important than the information asymmetry effect in determining firms' dividend payout policies. If the information asymmetry effect is dominant, we should observe a smaller decrease created by a positive combined effect. We further find that the propensity to pay dividends declines more at firms that are characterized by high information asymmetry during the GFC as well as during the post-IFRS adoption period. These firms are supposed to pay lower dividends, which should increase after a decline in information asymmetry. In our analysis, the propensity of these types of firms to pay dividends decreased further after agency costs declined. Furthermore, firms with high agency costs in IFRS countries have a higher propensity to pay dividends during the financial crisis, which reduces agency costs, relative to years in the pre-IFRS period. However, the propensity to pay dividends during the crisis years is lower than in non-crisis years in the post-IFRS adoption period. These findings provide additional support for the dominance of agency cost theory.

This study contributes to the debate on the determinants of a firm's payout policy. We design an empirical framework that links mandatory IFRS adoption and the GFC with the objective of distinguishing the information asymmetry from the agency cost explanation. Our findings offer new insights into the rationale for the changes in dividend payout policies in an international setting. We exploit the GFC to control for the decline in the agency costs of FCF combined with the lower information-asymmetry setting resulting from the earlier mandatory IFRS adoption to identify which of these theories is superior in explaining changes in payout policy. Our analysis is complementary to the empirical literature investigating information asymmetry and agency cost effects independently of each other.

The paper proceeds as follows. In Section 2, we review the literature and derive our hypotheses. Section 3 presents the data and methodology. Section 4 discusses and interprets the empirical results. Section 5 concludes.

2. Hypotheses

The most important reason for introducing IFRS worldwide was to ensure a single set of high-quality accounting standards across countries, thus enhancing financial transparency (Hail et al., 2014; Horton et al., 2013; Houqe et al., 2014). Consequently, the mandatory adoption of IFRS should provide better information for investors because of detailed disclosures, better cross-country comparability, and more economically motivated reporting. Prior studies suggest that higher financial transparency and lower information asymmetry leads to better and more precise accounting disclosures, which decreases both estimation risk and information asymmetry (De George et al., 2016). Therefore, we interpret the introduction of IFRS as an exogenous shock to financial markets that potentially reduced information asymmetry between managers and investors.

2.1. Lower information asymmetry and agency cost of free cash flow

Hail et al. (2014) focus on the FCF-based agency theory to explain changes in dividend payouts subsequent to the mandatory adoption of IFRS, which is expected to reduce information asymmetry. Their main argument is that the agency costs of FCF should decline when information quality increases. Thus, the propensity to pay dividends should also decline because of the smaller investors' concerns that managers might misuse cash flows (La Porta et al., 2008). Hail et al. (2014) empirically observe a decrease in the propensity to pay dividends after the adoption of IFRS, which is consistent with the prediction that a decline in information asymmetry leads to a decrease in the agency costs of FCF. This, in turn, reduces the need to distribute FCFs in the form of dividends to alleviate agency problems.

The GFC erupted suddenly in mid-2007 in the United States, rapidly spreading to international financial markets in 2008 and 2009. The subsequent European sovereign debt crisis amplified these problems (Becker and Ivashina, 2018). Swift monetary policy

changes and, especially, substantial liquidity provision by central banks in the US and Europe averted a liquidity and systemic banking crisis. We interpret the GFC as a negative exogenous shock to the supply of external financing (Jang, 2017). Worldwide economic activity dramatically slowed down and significantly decreased firms' profits and cash flows. This negative shock forced managers to substantially reduce dividends and share buybacks (Floyd et al., 2015). At the same time, these lower FCF at the firm level inevitably reduced the agency costs of cash flows.

Our investigation relies on the sample periods surrounding the IFRS adoption in 2005 and the GFC during 2008 and 2009. The initial objective of our research is to investigate the effect of both the mandatory adoption of IFRS on reducing information asymmetry and the GFC on reducing the agency cost of FCF. Both events should result in adjustments of firms' dividend policies across countries. Our first hypothesis posits the agency cost explanations of FCF. To test it, we separately examine the effects of IFRS adoption and the GFC on changes in the propensity to pay dividends. We expect to find a decline in dividend payments for both separate and independent events, as the reduced agency cost of FCF decreases managers' need to use dividends as a costly signaling device. However, if the adoption of IFRS resulted in lower information asymmetry, which could also lead to a decline in agency costs, then the effect of the GFC on dividend payouts should be barely observable.

Hypothesis 1a: *The propensity to pay dividends decreases after IFRS adoption because of lower information asymmetry.*

Hypothesis 1b: *The propensity to pay dividends decreases after the GFC because of lower agency costs of FCF.*

2.2. Information asymmetry versus agency cost explanations

Our main research objective is to disentangle the role of agency costs from the role of information asymmetry in explaining adjustments in dividend payouts. Kalay (2014) argues that the mechanisms through which IFRS adoption reduces information asymmetry and affects the dividend payout policy can be either direct or indirect. If lower information asymmetry affects payout policy indirectly via the ensuing reduction in agency costs, as argued in Section 2.1, the outcome should be a decrease in the propensity to pay dividends. However, this outcome can also result from a direct effect caused by lower agency costs. Conversely, the reduction in information asymmetry could also directly affect the payout policy, as managers would no longer need to retain a high cash flow at the firm. This direct effect of IFRS adoption should result in an increase in the firms' propensity to pay dividends.[2]

Identification of the precise role of information asymmetry and agency cost theories on dividend policy is challenging, as both are partially endogenous (Kalay, 2014). In our analysis, we combine the roles of agency cost and information asymmetry by analyzing the interacting effects of these two external shocks to disentangle agency costs from the information asymmetry effects. A negative and significant interaction from combining both shocks, which indicates a further decrease in the propensity to pay dividends, supports the agency cost explanation. If the information asymmetry effect is dominant, we should observe a similar or even weaker (smaller) effect that the GFC adds to the IFRS adoption effects. In this case, the interaction effect will be either insignificant or significantly positive. In line with the arguments in this discussion, our second hypothesis is as follows:

Hypothesis 2a: *If the information asymmetry explanation is dominant, the decrease in the propensity to pay dividends is similar or weaker because of the interaction of IFRS adoption and the GFC.*

Hypothesis 2b: *If the agency costs of FCF explanation is dominant, the decrease in the propensity to pay dividends is stronger because of the interaction between IFRS adoption and GFC.*

According to Kalay (2014), the different stages in a firm's life cycle are also important in determining the relative importance of the two alternatives of FCF-centric theories (DeAngelo et al., 2006). Therefore, we also test the relevance of information asymmetry and agency cost explanations across different types of firms. For this, we distinguish between firms with high information asymmetry (i.e., small firms with high growth opportunities) and firms with high agency costs (i.e., mature firms with high cash holdings). The main argument is that smaller firms with more investment opportunities are likely to be more exposed to information asymmetry problems, whereas mature firms with ample amounts of free cash flows are likely to be more concerned about FCF-related agency issues (Kalay, 2014). We expect information asymmetry explanations to be more relevant for firms with more asymmetric information. Consequently, agency cost explanations should be more relevant for firms with high agency costs. In this respect, the interaction effect between two independent exogenous shocks is either insignificant or significantly positive for firms with high information asymmetry, indicating the dominant role of information asymmetry. In contrast, we expect to find a negative and significant joint effect of the two exogenous shocks for firms with high agency costs, supporting the dominant role of agency theory. Thus, our third hypothesis is as follows:

Hypothesis 3a: *If the information asymmetry explanation is dominant, the decrease in the propensity to pay dividends is similar or weaker at small firms with high growth opportunities because of interaction of IFRS adoption and the GFC.*

Hypothesis 3b: *If the agency costs of FCF explanation is dominant, the decrease in the propensity to pay dividends is stronger at mature firms with high cash holdings because of interaction between IFRS adoption and GFC.*

[2] For example, Harakeh (2020) finds that IFRS adoption reduces the constraining effect of dividends on investment, especially for firms with higher information asymmetry.

3. Sample, data and methodology

3.1. Sample construction and data

In our empirical analysis, we employ an international dataset on 35 countries/regions for the period 2000–2010. Following Hail et al. (2014), we limit the sample to firms with a book value of assets greater than or equal to US$10 million. We exclude financial firms (SIC 6000–6999) and utilities (SIC 4900–4999) because of their special regulations, oversight, and specific regulatory requirements for receiving payout approval. We collect firm-level financial and accounting data from Thomson Reuters Datastream and winsorize all continuous financial variables at the top and bottom one-percentile. Our final unbalanced panel dataset consists of 101,011 firm-year observations for 11 years.

We use Hail et al. (2014) to determine the year of the mandatory adoption of IFRS accounting standards for each country and corroborate the adoption year on IFRS.org. We exclude countries, such as Israel, which adopted IFRS between 2005 and 2010, and China, which did not adopt IFRS (Ding and Su, 2008; Liu et al., 2011). We include countries that adopted IFRS in 2010 or later in our control sample. Datastream provides annual firm-level information about accounting standards implemented as well as the firm-level IFRS transition dates. These two data point enable us to identify the firms that voluntarily adopted IFRS reporting standards before the country's mandatory adoption date. The voluntary adoption of IFRS is associated with firm incentives that might confound the effect of IFRS per se (Christensen et al., 2015). To account for potential biases in our regressions, we exclude firms at which the firm-level IFRS adoption year precedes the mandatory adoption year.

3.2. Methodology

In our empirical analysis, we investigate the propensity of firms to pay dividends for the sample period 2000–2010, covering both 2005, the mandatory IFRS adoption year, and the GFC in 2008 and 2009. As our main interest is in combining IFRS adoption with the GFC, we focus on the post-IFRS adoption period, especially the GFC. Our proxy for measuring firms' propensity to pay dividends in our regressions is a dichotomous variable that takes a value of one if the variable dividends per share (DPS) is positive in any given year, and zero otherwise. The logistic regression methodology allows us to incorporate into our empirical analysis a dichotomous predictor as a response variable. We perform regressions using two different sample periods. The first is the full sample period from 2000 to 2010.[3] The second period is from 2003 to 2010, to use a shorter time window before the first shock (IFRS). We specify our models as follows:

$$\begin{aligned} &Prob(DIV\_PAYMENT_{it}) \\ &= \beta_0 + \beta_1 DIV\_PAYMENT_{it-1} + \beta_2 IFRS\_DUMMY_{jt} + \beta_3 CRISIS\_DUMMY_t + \beta_4 IFRS\_DUMMY_{jt} x CRISS\_DUMMY_t \\ &\quad + \beta_i CONTROLS_{it} + \sum \beta_k Industry + \sum \beta_c Country + e_{it} \end{aligned}$$

where i is the firm, j is the country, and t is the year. *DIV_PAYMENT* takes a value of one if the dividend per share is positive in any given year, and zero otherwise. *IFRS_DUMMY* captures changes in the propensity to pay dividends in the post-IFRS period, 2005–2010, relative to the pre-IFRS period, 2000–2004, at firms in countries that adopted IFRS and controls for countries that did not adopt IFRS. *CRISIS_DUMMY* captures the global crisis years, 2008 and 2009. The interaction *IFRS_DUMMY* × *CRISIS_DUMMY* identifies the change in the propensity to pay dividends during the crisis relative to the noncrisis years in the post-IFRS adoption period, especially compared with *IFRS_DUMMY*. This interaction dummy variable measures the joint effect of information asymmetry and agency costs and identifies which of these two effects is dominant in explaining payout policy. We cluster standard errors at the country level because IFRS adoption is a country-level event.

To control for potential differences in firm-level characteristics between firms in countries that did and did not adopt IFRS, we identify similar firms in both groups of countries. As suggested and employed by Harakeh (2020) and Karpuz et al. (2020), we perform propensity score matching (PSM) to identify similar pairs of firms in IFRS adopters and non-adopters in the same two-digit industry based on firm characteristics in 2005, rather than using firm/year observations in the full sample period. This approach provides a fair comparison between the pre- (i.e., 2000–2004) and post-treatment (i.e., 2005–2010) periods. We include firm-level variables, total assets, the ratio of retained earnings to shareholder equity, the ratio of cash to total assets, and Tobin's Q as covariates in the probit regressions to determine the propensity scores. We used nearest-neighbor one-to-one matching with caliper (0.001) and no replacement. PSM identifies 2086 matched firms among the 4374 firms in countries that adopted IFRS. Thus, our matched sample consists of 4172 firms in 2005, and the number of firm-year observations varies based on the availability of data for the alternative sample periods used in our analysis.

We provide PSM statistics that are relevant to confirmation of the matching strategy in the Appendix. In the first section, statistical tests that compare the mean value of the variables used in PSM reveal no significant differences in the means of the variables. In addition, a comparison of the statistics before and after matching produces statistically insignificant χ^2 values, rejecting biases in the mean and medians between raw and matched samples.

[3] Even though we use this sample period to capture the five years before and after the main event of IFRS adoption in 2005 as a starting point of our analysis, this creates limitations in identifying the real impact of the event for the purpose of robustness. Typically, if the sample period is restricted to three years before and after the IFRS adoption, it would be better at reducing the likelihood that the results will be affected by factors unrelated to the reform. However, our results are not affected bu using a longer or shorter sample period.

The regression equation using the matched sample created by the PSM is as follows:

$$\begin{aligned} &Prob(DIV\_PAYMENT_{it}) \\ &= \beta_0 + \beta_1 DIV\_PAYMENT_{it-1} + \beta_2 TREATED_{it} + \beta_3 \quad TREATED_{it} \times IFRS\_DUMMY_{jt} + \beta_4 CRISIS\_DUMMY_t \\ &\quad + \beta_5 \quad TREATED_{it} \times IFRS\_DUMMY_{jt} \times CRISIS\_DUMMY_t + \beta_i CONTROLS_{it} + \sum \beta_k Industry + \sum \beta_c Country + e_{it} \end{aligned}$$

where *i* is the firm, *j* is the country, and *t* is the year. *TREATED* is the treated group of firms located in IFRS-adopting countries against the matched firms located in nonadopting countries. Thus, *TREATED* × *IFRS_DUMMY* captures the difference between the treated and control firms in the change in the propensity to pay dividends in the post-IFRS adoption period relative to pre-IFRS adoption period. *CRISIS_DUMMY*, which is the same as *TREATED* × *CRISIS_DUMMY*, captures the difference between the treated and control firms in the change in the propensity to pay dividends during the GFC (2008 and 2009) relative to the other years. Finally, we use the triple interaction *TREATED* × *IFRS_DUMMY* × *CRISIS_DUMMY* to disentangle the role of agency from the role of information asymmetry by examining the joint effect of the two external shocks. This variable, compared with the interaction *TREATED* × *IFRS_DUMMY*, captures the difference between the treated and control firms in the change in the propensity to pay dividends during the GFC relative to the non-crisis years in the post-IFRS period.

We also test the relevance of information asymmetry and agency cost explanations across types of firms with high information asymmetry and with high agency costs to determine the relative weight of these two elements of the FCF-centric theory, respectively. We divide the firms into groups in both our full and matched samples based on the following firm characteristics. First, we use firm size, measured by the book value of total assets in USD, and growth potential, measured by the market-to-book ratio (Tobin's Q) to identify firms that are subject to information asymmetry concerns. We define a firm as a small and high-growth firm, which is subject to high information asymmetry, if it has a smaller and higher market-to-book ratio than the sample medians of these two variables, respectively. Second, to identify firms that are subject to agency cost concerns, we employ the ratio of retained earnings to shareholder equity to identify mature firms as well as the cash-to-assets ratio to measure the level of cash holdings. Again, we use the sample medians of these variables to identify a firm as mature and cash holdings as high if its retained earnings and cash holdings are higher than the sample medians, respectively.[4]

We incorporate the typical determinants of dividend policy as control variables (Brockman and Unlu, 2009; Hail et al., 2014), such as sales growth, profitability, firm size, retained earnings, share buybacks, cash holdings, shareholder equity, cash-flow volatility, Tobin's Q, and a dichotomous variable identifying firms with negative earnings. All variables (except for sales growth, firm size, and the categorical variable for negative earnings) are ratios scaled by total assets. Moreover, we include a dummy variable to control for ADRs. Table 1 presents the definitions of all variables.

Profitability and sales growth are positively associated with the propensity to pay dividends (Brockman and Unlu, 2009), as profitable firms with high sales growth generate higher profits and cash flows and thus can pay higher dividends. Firm size is also positively related to dividends, as large firms tend to have better access to capital markets, allowing them to raise funds for investment if necessary. Therefore, larger firms are more likely to pay dividends. According to the life-cycle theory, retained earnings are positively associated with dividends, as firms with substantial retained earnings are more likely to initiate or maintain steady dividends. The role of share buybacks has gained increasing importance in payout policies (Brav et al., 2005; Hail et al., 2014). Given its higher flexibility relative to dividends, many cross-listed firms that are committed to higher transparency standards increasingly use this type of cash distribution (Floyd et al., 2015, on the US; von Eije and Megginson, 2008, on Europe). To control for this factor, we collect an identifier for non-US companies that have ADR trading on a US exchange from Thomson Reuters Datastream. Finally, all regressions include industry-, country-, and year-fixed effects. When *CRISIS_DUMMY* is included in a model, we exclude year-fixed effects.

Our sample includes a set of heterogeneous countries. Therefore, we include country-fixed effects in all our regressions. In addition, we include two specific country-level variables that are closely related to our analysis. Because changes in taxes could affect the incentives for changing dividend payout, it is important to control for the tax changes that coincide with IFRS adoption. Therefore, we collect corporate tax rates by year for our sample countries from taxfoundation.org. We then create a dichotomous variable for that year and following years reflecting any rate changes after IFRS adoption in 2005. The second country-level variable denotes the divergence between domestic accounting standards and IFRS. We use the proxy developed by Bae et al. (2008), which comprises a list of 21 important accounting rules based on a comprehensive survey of GAAP differences. The total GAAP difference score is between 0 and 21, in which a higher score means a larger difference between domestic accounting standards and IFRS.

3.3. Sample summary statistics

In Table 2, we present the sample summary statistics. Panels A and B present all firm- and country-level variables in our analyses. The data is divided into three groups: full sample countries, mandatory IFRS-adopting countries, and non-IFRS-adopting countries.

[4] These two classifications were introduced by Kalay, who states that "smaller firms with more investment opportunities and less FCF are likely to be more concerned with information asymmetry issues related to their investments, and mature firms with ample amounts of cash are more likely to be concerned with FCF-related agency issues" (2014, 463). The proxies for these identifications were used in DeAngelo et al. (2006), following the study by Fama and French (2001), who categorized the US firms as small firms based on the smallest size deciles of NYSE firms and used the market-to-book ratio in addition to growth of assets or sales to investment opportunities. In addition, mature firms are based on the ratio of retained earnings to total earnings or total assets, and cash-rich firms are defined based on the ratio of cash to total assets.

Table 1
Variable definitions.

Variables	Definitions
DIV_PAYMENT	Dummy variable representing positive dividends per share in a particular year.
SALES GROWTH	Percentage change in net sales from year *t*-1 to year *t*.
PROFITABILITY	Ratio of earnings before interest and taxes to book value of total assets.
SIZE (LN_ASSESTS)	Natural logarithm of book value of assets in USD.
RET_EARNINGS	Ratio of retained earnings to book value of shareholders' equity.
REPURCHASES	Ratio of stocks repurchased, retired, converted, and redeemed to the book value of total assets.
CASH_HOLDINGS	Ratio of cash and short-term investment to the book value of total assets.
EQUITY_RATIO	Ratio of book value of shareholders' equity to the book value of total assets.
CF_VOLATILITY	Standard deviation of cash flows, estimated as the ratio of (net income + depreciation) to the book value of total assets, over the last three years.
NEG_EARNINGS	Dummy variable representing firms with negative income in a particular year.
TOBIN_Q	Ratio of (book value of total assets + market value of common equity − book value of common equity) to the book value of total assets.
IFRS_DUMMY	Dummy variable representing the years after IFRS adoption in 2005 (excluding firms that voluntarily adopted IFRS before the mandatory adoption year).
CRISIS_DUMMY	Dummy variable representing the recent global crisis years, 2008–2009.
ADR_DUMMY	Dummy variable for non-US companies with American Depository Receipts (ADR) trading on a US exchange.
TAXCHANGE	Dummy variable representing the years after a corporate tax rate change after IFRS adoption in 2005.
GAAPACCDIFF	GAAP difference score that ranges between 0 and 21 denoting differences in GAAP between two countries.

We report the mean, median, and standard deviation of all the variables for the full sample period, 2000–2010. We also perform statistical tests on the difference in the mean and median values between two subsamples. The results on the firms' propensity to pay dividends indicate that the percentage of firms paying dividends is, on average, significantly lower in IFRS-adopting countries (58.4%) than in non-IFRS countries (71.7%). Except in one case, the mean and median values of all variables are statistically significantly different between adopters and non-adopters.

In Panel C of Table 2, we present summary statistics for the dividend payout variable, the percentage of ADR firms, as well as frequency of observations that capture the years after a change in corporate tax, the sum of the number of items that diverge between domestic accounting standards and IFRS, and IFRS adoption years at the country level. In creating the matched sample, countries that adopted IFRS are included in the treatment group, and countries that never adopted IFRS (Egypt, India, Indonesia, Japan, Mexico, Russia, and Thailand) and those that adopted IFRS after 2010 (Argentina, Canada, Republic of Korea, and Mexico) are in the control group. The propensity to pay dividends ranges from 21.5% for Norway to 54.9% for Egypt.

We also examine the time trend in the propensity to pay dividends during our sample period 2000–2010. In Fig. 1, we present the mean percentage of firms that pay dividends in IFRS-adopting countries compared to firms in non-IFRS-adopting countries. During the pre-IFRS adoption period until 2005, firms in both types of countries followed a similar pattern though the percentage of firms that pay dividends in non-IFRS-adopting countries was higher. We observe a decrease in the propensity to pay dividends between 2000 and 2002, followed by an increase until 2005. This is consistent with the parallel-trend argument before the information asymmetry shock. Between 2005 and 2007, just before the GFC, the propensity to pay dividends remained comparable to that observed in 2004 in IFRS-adopting countries, but it continued to increase in non-IFRS-adopting countries. Then, during the GFC in 2008 and 2009, we observe a significant decrease in the propensity to pay dividends by firms in IFRS-adopting countries, whereas in non-IFRS-adopting countries it continued to increase. In 2010, the propensity returned to the level observed in IFRS-adopting countries before the GFC.

In Fig. 2, we compare pre- and post-treatment trends in the propensity to pay dividends for the matched sample. We observe a parallel trend between the two groups before 2005. For the entire post-IFRS period, however, the trend between the groups breaks down during the GFC, as we observe a decrease in the propensity to pay dividends by the treatment firms in IFRS-adopting countries. This preliminary analysis offers evidence of a significant impact of IFRS adoption and the GFC on the firms' propensity to pay dividends.

Table 3 reports Pearson correlation coefficients for all variables. We do not observe high correlations among variables that could affect the validity of the estimated coefficients in our regression analyses.

4. Results

4.1. The effects of reduction in information asymmetry and agency costs

In this section, we present the results from the regression analysis testing the changes in the propensity to pay dividends after the mandatory IFRS adoption, during the GFC, and a combination of these two external shocks. Panel A of Table 4 presents the results for the full sample and the period 2000–2010, as well as the period 2003–2010 as a robustness check. In Column 1, the estimated coefficients corresponding to our dichotomous variable *IFRS_DUMMY* are similar for the two sample periods: − 0.501 and − 0.517, respectively, and statistically significant at the 1% level; this indicates that the propensity to pay dividends is statistically significantly lower in the period after IFRS adoption than before IFRS adoption. This finding is consistent with that of Hail et al. (2014) and supports H1a, which suggests that the propensity to pay dividends decreases due to a decline in information asymmetry.

Table 2
Sample statistics.

Panel A: Full sample

	All sample countries (N = 101,011)				
Variables	Mean	Median	Std. Dev.	Minimum	Maximum
DIV_PAYMENT	0.657	1.000	0.475	0.000	1.000
SALES_GROWTH	0.145	0.051	0.553	-0.679	4.689
PROFITABILITY	0.037	0.051	0.141	-0.739	0.368
SIZE (LN_ASSESTS)	12.326	12.123	1.702	9.333	17.164
RET_EARNINGS	0.240	0.333	0.530	-1.000	1.000
REPURCHASES	0.003	0.000	0.013	0.000	0.141
CASH_HOLDINGS	0.146	0.101	0.147	0.000	0.816
EQUITY_RATIO	0.467	0.467	0.244	-0.559	0.954
CF_VOLATILITY	0.053	0.024	0.089	0.001	0.657
NEG_EARNINGS	0.258	0.000	0.437	0.000	1.000
TOBIN_Q	1.358	1.069	0.989	0.413	8.646
ADR_DUMMY	0.052	0.000	0.223	0.000	1.000
COTAX_CHANGE	0.100	0.000	0.300	0.000	1.000
GAAPACC_DIFF	7.517	9.000	3.917	0.000	18.000

Panel B: Sample statistics for IFRS and non-IFRS countries

	IFRS countries (N = 45,589)		Non-IFRS countries (N = 55,422)		Difference	
Variables	Mean	Median	Mean	Median	Mean	Median
DIV_PAYMENT	0.584	1.000	0.717	1.000	-0.133 * **	0.000 * **
SALES_GROWTH	0.191	0.074	0.107	0.036	0.084 * **	0.037 * **
PROFITABILITY	0.036	0.062	0.037	0.044	-0.001	0.018 * **
SIZE (LN_ASSESTS)	12.208	11.926	12.423	12.248	-0.215 * **	-0.322 * **
RET_EARNINGS	0.152	0.209	0.312	0.417	-0.161 * **	-0.208 * **
REPURCHASES	0.003	0.000	0.002	0.000	0.001 * **	0.000 * **
CASH_HOLDINGS	0.143	0.088	0.148	0.110	-0.005 * **	-0.022 * **
EQUITY_RATIO	0.460	0.455	0.473	0.477	-0.014 * **	-0.022 * **
CF_VOLATILITY	0.066	0.030	0.043	0.020	0.023 * **	0.011 * **
NEG_EARNINGS	0.276	0.000	0.243	0.000	0.032 * **	0.000 * **
TOBIN_Q	1.530	1.211	1.216	0.986	0.314 * **	0.224 * **
ADR_DUMMY	0.088	0.000	0.023	0.000	0.065 * **	0.000 * **
COTAX_CHANGE	0.126	0.000	0.078	0.000	0.048 * **	0.000 * **
GAAPACC_DIFF	7.001	4.000	7.940	9.000	-0.939 * **	-5.000 * **

Panel C: Sample countries and selected variables

Country	N	DIV_PAYMENT	ADR_DUMMY	COTAX_ CHANGE	GAAPACC_ DIFF	IFRS YEAR (in the sample period)
Argentina	396	0.240	0.182	0.000	14	NON_IFRS
Australia	5176	0.396	0.104	0.000	4	2005
Austria	436	0.353	0.165	0.000	12	2005
Belgium	526	0.422	0.055	0.000	13	2005
Canada	6700	0.201	0.000	0.269	5	NON_IFRS
Denmark	731	0.279	0.085	0.083	11	2005
Egypt	102	0.549	0.000	0.000	10	NON_IFRS
Finland	704	0.436	0.018	0.000	15	2005
France	5114	0.378	0.067	0.095	12	2005
Germany	4368	0.271	0.098	0.407	11	2005
Greece	1755	0.324	0.011	0.278	17	2005
Hong Kong	5644	0.310	0.100	0.112	3	2005
Hungary	142	0.183	0.077	0.092	13	2005
India	1042	0.362	0.017	0.215	8	NON_IFRS
Indonesia	1503	0.258	0.012	0.090	4	NON_IFRS
Ireland	421	0.418	0.268	0.000	1	2005
Italy	1740	0.334	0.048	0.089	12	2005
Japan	33,778	0.301	0.025	0.000	9	NON_IFRS
Korea, Rep.	3777	0.327	0.010	0.003	6	NON_IFRS
Luxembourg	138	0.478	0.348	0.152	18	2005
Malaysia	6342	0.311	0.014	0.311	8	NON_IFRS
Mexico	822	0.326	0.000	0.218	1	NON_IFRS
Netherlands	755	0.434	0.226	0.248	4	2005
Norway	354	0.215	0.062	0.000	6	2005
Philippines	888	0.232	0.038	0.182	10	2005
Poland	1073	0.238	0.019	0.000	12	2005
Portugal	429	0.301	0.075	0.072	13	2005
Russia	300	0.543	0.497	0.080	16	NON_IFRS

(*continued on next page*)

Table 2 (*continued*)

South Africa	1981	0.477	0.180	0.172	0	2005
Spain	866	0.448	0.054	0.167	16	2005
Sweden	1102	0.297	0.027	0.091	10	2005
Switzerland	1090	0.366	0.084	0.191	12	2005
Thailand	660	0.361	0.055	0.000	4	NON_IFRS
Turkey	416	0.274	0.024	0.099	14	2006
United Kingdom	9740	0.454	0.089	0.093	1	2005
Total	101,011	0.328	0.052	0.100	7.516	

Notes: This table reports the mean, median, and standard deviation of variables used in the analyses (Panel A) and the mean values of variables of dividend payout and country level variables by country (Panel B). The sample covers the period from 2000 to 2010. The significance of differences between means and medians is based on a *t*-test for mean differences and Wilcoxon rank-sum test for median differences. * ** denotes statistical significance at the 1% level. Definitions of the variables are in Table 1.

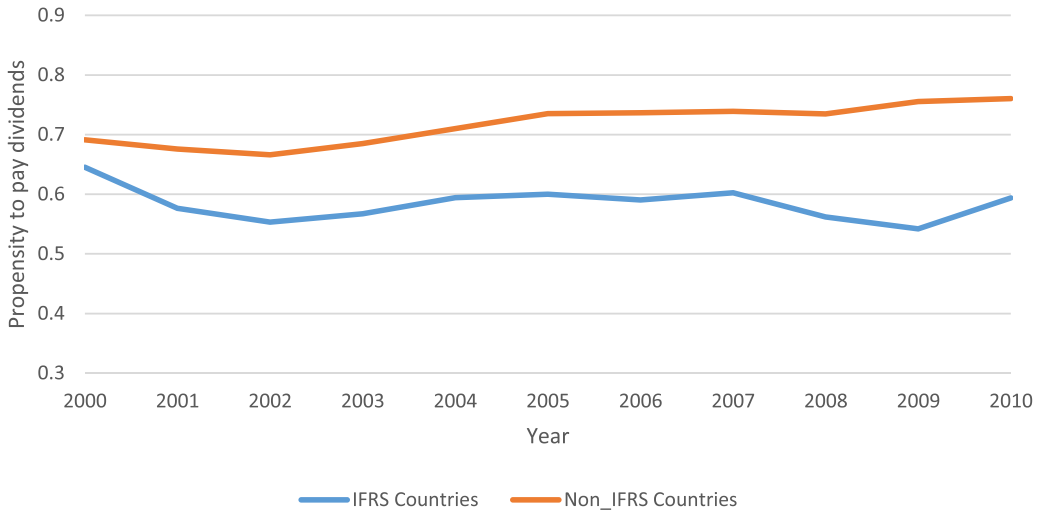

Fig. 1. Time trend of the propensity to pay dividends: Full sample.

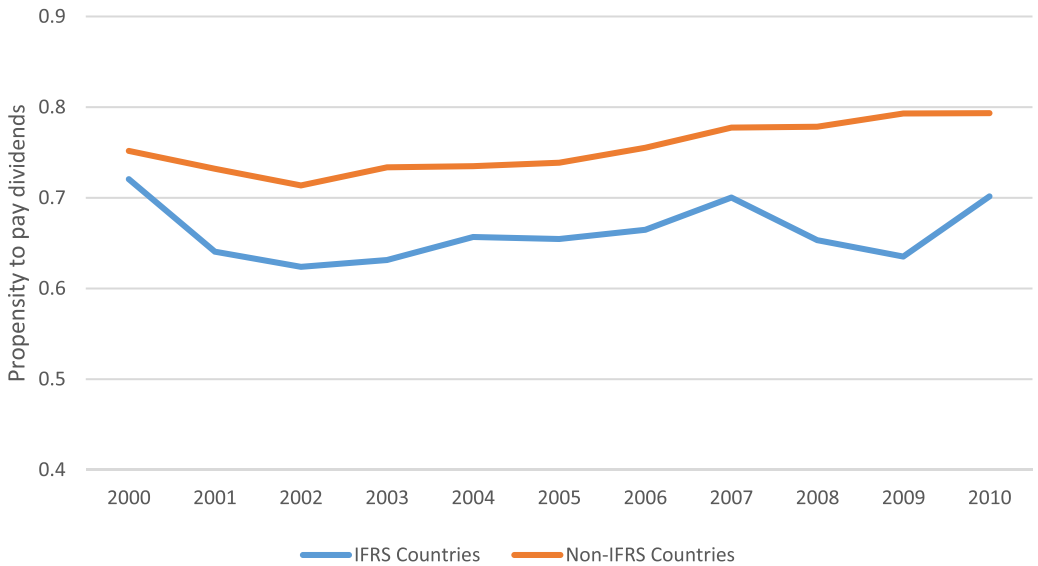

Fig. 2. Time trend of the propensity to pay dividends: Matched sample.

Table 3
Correlation matrix.

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1)	DIV_PAYMENT	1														
(2)	SALES_GROWTH	-0.0837 *	1													
(3)	PROFITABILITY	0.4120 *	0.0358 *	1												
(4)	SIZE (LN_ASSESTS)	0.3200 *	-0.0365 *	0.1952 *	1											
(5)	RET_EARNINGS	0.5195 *	-0.0930 *	0.4080 *	0.2753 *	1										
(6)	REPURCHASES	0.0591 *	-0.0183 *	0.1052 *	0.0988 *	0.0726 *	1									
(7)	CASH_HOLDINGS	-0.0072 * *	0.0402 *	-0.0238 *	-0.1669 *	-0.0170 *	0.0615 *	1								
(8)	EQUITY_RATIO	0.1493 *	0.0552 *	0.1711 *	-0.1849 *	0.0503 *	0.0474 *	0.3616 *	1							
(9)	CF_VOLATILITY	-0.3920 *	0.0882 *	-0.4876 *	-0.2577 *	-0.3522 *	-0.0124 *	0.1310 *	-0.0949 *	1						
(10)	NEG_EARNINGS	-0.5013 *	-0.0300 *	-0.6358 *	-0.2010 *	-0.4094 *	-0.0649 *	0.0069 * *	-0.1694 *	0.3405 *	1					
(11)	TOBIN_Q	-0.0401 *	0.1367 *	0.1235 *	-0.0541 *	-0.0226 *	0.1095 *	0.2415 *	0.0187 *	0.1437 *	-0.0472 *	1				
(12)	ADR_DUMMY	0.0303 *	0.0094 *	0.0313 *	0.3028 *	0.0197 *	0.0720 *	0.0183 *	-0.0241 *	0.0074 * *	-0.0206 *	0.0778 *	1			
(13)	COTAX_CHANGE	-0.0809 *	0.0260 *	0.006	-0.0081 * *	-0.0572 *	0.0256 *	-0.0168 *	0.0282 *	0.0296 *	0.0161 *	0.0035	0.0025	1		
(14)	GAAPACC_DIFF	0.0714 *	-0.0938 *	0.0259 *	0.0891 *	0.0347 *	-0.0449 *	-0.0255 *	-0.0917 *	-0.1554 *	-0.0452 *	-0.0774 *	-0.0577 *	0.0044	1	
(15)	IFRS_DUMMY	-0.0893 *	0.0609 *	0.0351 *	0.0130 *	-0.0589 *	0.0476 *	0.0188 *	0.0135 *	0.0592 *	-0.0067 * *	0.1340 *	0.0878 *	0.2500 *	-0.0977 *	1

Notes: This table reports correlation coefficients between pairs of variables. The sample covers the period 2000–2010. Statistical significance: * at the 1% level; * * at the 5% level. Definitions of the variables are given in Table 1.

Table 4
The effects of information asymmetry and agency costs.

Panel A: Full sample

	2000–2010			2003–2010		
	1	2	3	1	2	3
DIV_PAYMENT_LAG1	4.006 * **	3.993 * **	3.999 * **	4.045 * **	4.044 * **	4.051 * **
	(0.215)	(0.216)	(0.218)	(0.212)	(0.214)	(0.216)
SALES GROWTH	0.125 * **	0.116 * *	0.117 * *	0.132 * **	0.129 * **	0.130 * **
	(0.047)	(0.048)	(0.048)	(0.045)	(0.044)	(0.043)
PROFITABILITY	3.589 * **	3.515 * **	3.518 * **	3.597 * **	3.576 * **	3.568 * **
	(0.581)	(0.586)	(0.580)	(0.570)	(0.565)	(0.563)
SIZE (LN_ASSESTS)	0.277 * **	0.278 * **	0.280 * **	0.282 * **	0.281 * **	0.283 * **
	(0.016)	(0.018)	(0.017)	(0.014)	(0.014)	(0.014)
RET_EARNINGS	0.985 * **	0.982 * **	0.985 * **	0.887 * **	0.885 * **	0.887 * **
	(0.264)	(0.264)	(0.263)	(0.251)	(0.251)	(0.249)
REPURCHASES	0.577	0.529	0.467	-0.219	-0.275	-0.364
	(1.078)	(1.128)	(1.089)	(1.261)	(1.298)	(1.258)
CASH_HOLDINGS	0.071	0.066	0.064	-0.001	-0.007	-0.01
	(0.246)	(0.259)	(0.258)	(0.271)	(0.283)	(0.283)
EQUITY_RATIO	1.483 * **	1.507 * **	1.498 * **	1.371 * **	1.369 * **	1.364 * **
	(0.356)	(0.348)	(0.349)	(0.336)	(0.325)	(0.326)
CF_VOLATILITY	-1.838 * **	-1.786 * **	-1.787 * **	-1.765 * **	-1.769 * **	-1.763 * **
	(0.531)	(0.531)	(0.531)	(0.451)	(0.453)	(0.449)
NEG_EARNINGS	-2.019 * **	-2.041 * **	-2.043 * **	-1.953 * **	-1.953 * **	-1.963 * **
	(0.077)	(0.080)	(0.084)	(0.078)	(0.077)	(0.085)
TOBIN_Q	-0.082	-0.067	-0.07	-0.072	-0.065	-0.065
	(0.058)	(0.049)	(0.049)	(0.053)	(0.046)	(0.045)
ADR_DUMMY	-0.1	-0.108	-0.108	-0.097	-0.094	-0.095
	(0.118)	(0.120)	(0.118)	(0.114)	(0.115)	(0.112)
COTAX_CHANGE	0.091	0.06	0.037	0.072	0.02	0.002
	(0.131)	(0.145)	(0.138)	(0.116)	(0.128)	(0.124)
GAAPACC_DIFF	-0.119 * **	-0.109 * **	-0.114 * **	-0.106 * **	-0.102 * **	-0.108 * **
	(0.008)	(0.011)	(0.011)	(0.010)	(0.011)	(0.011)
IFRS_DUMMY	-0.501 * **	-0.321 * **	-0.190 * *	-0.517 * **	-0.455 * **	-0.342 * **
	(0.112)	(0.105)	(0.096)	(0.106)	(0.118)	(0.105)
CRISIS_DUMMY		-0.236	0.093		-0.293 * *	0.022
		(0.167)	(0.152)		(0.148)	(0.136)
IFRS_D.* CRISIS_D.			-0.699 * **			-0.640 * **
			(0.209)			(0.191)
CONSTANT	-4.585 * **	-4.479 * **	-4.481 * **	-4.318 * **	-4.287 * **	-4.287 * **
	(0.461)	(0.451)	(0.458)	(0.503)	(0.494)	(0.505)
pseudo R^2	0.673	0.672	0.673	0.675	0.675	0.675
N	101,011	101,011	101,011	74,639	74,639	74,639
COUNTRY FE	Yes	Yes	Yes	Yes	Yes	Yes
INDUSTRY FE	Yes	Yes	Yes	Yes	Yes	Yes
YEAR FE	Yes	No	No	Yes	No	No

Panel B: Matched sample

	2000–2010			2003–2010		
	1	2	3	1	2	3
DIV_PAYMENT_LAG1	3.994 * **	3.966 * **	3.969 * **	4.050 * **	4.035 * **	4.039 * **
	(0.206)	(0.210)	(0.212)	(0.192)	(0.195)	(0.196)
SALES GROWTH	0.133 * *	0.117 * *	0.117 * *	0.187 * **	0.178 * **	0.178 * **
	(0.054)	(0.056)	(0.056)	(0.056)	(0.056)	(0.055)
PROFITABILITY	4.103 * **	4.011 * **	3.980 * **	4.078 * **	4.028 * **	3.981 * **
	(0.683)	(0.667)	(0.668)	(0.610)	(0.595)	(0.603)
SIZE (LN_ASSESTS)	0.260 * **	0.262 * **	0.264 * **	0.265 * **	0.266 * **	0.268 * **
	(0.021)	(0.022)	(0.021)	(0.022)	(0.021)	(0.022)
RET_EARNINGS	1.028 * **	1.033 * **	1.031 * **	0.934 * **	0.935 * **	0.931 * **
	(0.271)	(0.265)	(0.265)	(0.249)	(0.244)	(0.243)
REPURCHASES	-2.109	-2.293	-2.344	-2.523	-2.832	-2.906
	(1.941)	(1.958)	(1.918)	(1.824)	(1.822)	(1.778)
CASH_HOLDINGS	0.09	0.087	0.084	0.082	0.086	0.079
	(0.369)	(0.390)	(0.391)	(0.411)	(0.437)	(0.439)

(*continued on next page*)

Table 4 (*continued*)

EQUITY_RATIO	1.362 * **	1.384 * **	1.388 * **	1.301 * **	1.308 * **	1.314 * **
	(0.402)	(0.395)	(0.398)	(0.387)	(0.371)	(0.374)
CF_VOLATILITY	-2.103 * **	-1.995 * **	-1.992 * **	-2.082 * **	-2.041 * **	-2.030 * **
	(0.601)	(0.588)	(0.588)	(0.532)	(0.537)	(0.531)
NEG_EARNINGS	-2.028 * **	-2.039 * **	-2.042 * **	-1.970 * **	-1.965 * **	-1.974 * **
	(0.098)	(0.100)	(0.105)	(0.099)	(0.097)	(0.105)
TOBIN_Q	-0.155 * *	-0.145 * *	-0.145 * **	-0.169 * **	-0.160 * **	-0.158 * **
	(0.067)	(0.056)	(0.056)	(0.062)	(0.053)	(0.052)
ADR_DUMMY	-0.004	-0.018	-0.018	0.002	0.001	0.002
	(0.095)	(0.099)	(0.099)	(0.097)	(0.100)	(0.099)
COTAX_CHANGE	0.17	0.066	0.053	0.165	0.042	0.032
	(0.166)	(0.174)	(0.171)	(0.155)	(0.165)	(0.161)
GAAPACC_DIFF	-0.120 * **	-0.118 * **	-0.117 * **	-0.101 * **	-0.102 * **	-0.101 * **
	(0.005)	(0.006)	(0.007)	(0.006)	(0.006)	(0.007)
TREATED	-0.181 *	-0.217 * *	-0.165	-0.318 * **	-0.264 * *	-0.210 *
	(0.097)	(0.110)	(0.109)	(0.122)	(0.119)	(0.115)
TREATED*IFRS_D.	-0.402 * *	-0.311 * *	-0.222 *	-0.361 * *	-0.425 * **	-0.349 * *
	(0.157)	(0.137)	(0.122)	(0.164)	(0.156)	(0.145)
CRISIS_DUMMY		-0.324 *	-0.024		-0.387 * *	-0.109
		(0.177)	(0.208)		(0.156)	(0.189)
TREATED*IFRS*CRISIS			-0.574 * *			-0.513 * *
			(0.253)			(0.234)
CONSTANT	-4.925 * **	-4.719 * **	-4.802 * **	-4.764 * **	-4.866 * **	-4.955 * **
	(0.548)	(0.494)	(0.496)	(0.598)	(0.578)	(0.575)
pseudo R^2	0.646	0.645	0.645	0.65	0.65	0.65
N	35,456	35,456	35,456	26,849	26,849	26,849
COUNTRY FE	Yes	Yes	Yes	Yes	Yes	Yes
INDUSTRY FE	Yes	Yes	Yes	Yes	Yes	Yes
YEAR FE	Yes	No	No	Yes	No	No

Notes: This table reports the results from logistic regressions to determine the propensity of firms to pay dividends (DIV_PAYMENT) by estimating the propensity to pay dividends using the full sample (Panel A) and matched sample (Panel B). Standard errors reported in parentheses are clustered at the country level. All models include country-, industry-, and year-fixed effects. * **, * *, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. The definitions of all variables are given in Table 1.

In Column 2, we include the shock the GFC in the regression model. The *CRISIS_DUMMY* coefficient is − 0.293 and significant at the 5% level for the period 2003–2010, indicating that the propensity to pay dividends is significantly lower during the GFC than during non-crisis years. This finding supports our Hypothesis 1b and expectation that the agency cost of FCF should decrease. In these regressions, the *IFRS_DUMMY* coefficients (−0.321 and −0.455, respectively, for the two sample periods) remain negative and statistically significant. Thus, these outcomes confirm that the propensity to pay dividends decreases after the two external shocks that reduced both information asymmetry and agency costs.

The third model in Column 3 includes the interaction *IFRS_DUMMY* × *CRISIS_DUMMY*, which identifies whether information asymmetry or agency costs play a dominant role in explaining adjustments in payout policies. The estimated coefficients of this joint effect are − 0.699 and − 0.640 for both periods and are significant at the 1% level. This result indicates that during the GFC and after IFRS adoption, the propensity to pay dividends decreases further. We interpret these outcomes as confirming our expectation expressed in H2b with respect to the importance of the agency cost explanation. In the event of an indirect effect caused by agency costs, which resulted from the information asymmetry after the adoption of IFRS and the additional decrease in the agency cost caused by the GFC shock, this would have had only a small effect. In contrast, if the direct information asymmetry effect was dominant, this could have created either an insignificant or a positive and significant interaction coefficient.

The estimated coefficients of all control variables are consistent across all models and two sample periods. For instance, paying a dividend last year increases the propensity to pay dividends. The propensity to pay dividends is positively related to changes in sales growth, profitability, size, the retained earnings ratio, and total shareholder equity. However, the propensity to pay dividends decreases with an increase in firm-level cash-flow volatility and with a larger difference between GAAP and IFRS accounting standards. We find no significant effect of *ADR_DUMMY* or changes in the corporate tax rate.

4.2. Matched sample results based on PSM

Panel B of Table 4 presents the results for the matched sample, which includes pairs of treated firms located in countries that adopted IFRS and control firms located in non-IFRS-adopting countries for the periods 2000–2010 and 2003–2010 as well as for the full sample. In Columns (1) and (2), the negative and significant estimated coefficients of *TREATED* indicate that the treated firms, on average, have a lower propensity to pay dividends than the control firms during the two sample periods. The coefficients of the difference-in-differences variable, *TREATED* × *IFRS_D*, are also negative and significant (−0.402, −0.311 and −0.361, −0.425 for the two periods, respectively), showing that the difference between the treated and control firms in the propensity to pay dividends is significantly larger in the post-IFRS adoption period than in the pre-IFRS adoption period. This also suggests that the propensity to

pay dividends decreased more for firms in IFRS-adopting countries due to their lower information asymmetry than for similar firms in non-IFRS-adopting countries.

With respect to the effects of the GFC, the negative and significant estimated coefficients (−0.324 and −0.387) of *CRISIS_DUMMY* in Column (2) indicate that the difference between the treated and the control firms in the propensity to pay dividends is significantly larger during the GFC (2008–2009) than in the other years. These findings reveal that firms in countries with less information asymmetry are affected more by a reduction in agency costs than those in countries with no change in information asymmetry.

In Column (3), we introduce a triple interaction, *TREATED* × *IFRS_DUMMY* × *CRISIS_DUMMY*, to disentangle the role of agency cost from the role of information asymmetry by examining the joint effect of the two external shocks. The estimated coefficients of this variable are − 0.574 and − 0.513, which are significant at the 5% level in both sample periods. This evidence indicates that the difference between the treated and control firms with respect to the change in the propensity to pay dividends is greater during the GFC than in the non-crisis years in the post-IFRS period, as captured by the interaction *TREATED* × *IFRS_DUMMY*.[5] The insignificant coefficients of *CRISIS_DUMMY* in Column (3) imply that there is no significant difference between the treated and control firms in the propensity to pay dividends during the crisis period than in the pre-IFRS adoption period. Therefore, the GFC resulted in a significant difference between the two groups during the post-IFRS adoption period as information asymmetry declined. These results support the dominant role of a decrease in the agency costs of FCF in explaining adjustments in dividend payout policy. This is consistent with H2b.

4.3. Firms concerned with high information asymmetry

In this section, we identify the relative importance of information asymmetry by grouping sample firms based on differences in information asymmetry concerns. High information asymmetry firms are small, with assets in USD of less than the sample median, and have high-growth opportunities as shown by having higher market-to-book ratios than the sample median. Panel A of Table 5 reports the results for the full and matched samples for the shorter period, 2003–2010.[6] The results for a longer sample period, 2000–2010, are similar (unreported).

The results for the full sample reveal negative and significant estimated coefficients for *IFRS_DUMMY,* independent of whether *CRISIS_DUMMY* is included in the model. Lower information asymmetry reduces the propensity to pay dividends for such high information asymmetry firms. As expected, the effect of IFRS adoption is larger for smaller firms than for the full sample, as reported in Panel A of Table 4. Furthermore, *CRISIS_DUMMY* is insignificant, indicating that no standalone agency cost reduction effect is found on the propensity to pay dividends by firms with high information asymmetry. However, in identifying whether information asymmetry or agency costs play the dominant role in explaining payout policies, the interaction *IFRS_DUMMY* × *CRISIS_DUMMY* has a negative and significant coefficient (−0.609), which is consistent with the results in Table 4. This finding indicates that, in the post-IFRS adoption period, the decrease in the propensity to pay dividends by firms with high information asymmetry is also greater during a crisis than in noncrisis years. This evidence is consistent with the agency cost explanation and supports H3b. In contrast, a dominant direct information asymmetry effect should have had no significant effect, either as a standalone effect of the crisis dummy or as a positive joint effect.

The second section of Panel A of Table 5 reports the results for the matched sample of firms concerned with high information asymmetry. In Columns (1) and (2), the estimated coefficients of *TREATED* are positive and significant, which is different from those in Panel A of Table 4. They reveal that our treated small and high-growth firms, on average, have a higher propensity to pay dividends than similar firms in non-IFRS-adopting countries. However, the coefficients of the DID variable, *TREATED* × *IFRS_DUMMY*, are negative and significant. Thus, in IFRS-adopting countries, the propensity to pay dividends by firms with asymmetric information concerns decreased more due to the lower information asymmetry than in non-IFRS-adopting countries. We did not find a significant reduction in the propensity to pay dividends during the GFC for the matched sample as well as for the full sample. In Column (3), *TREATED* × *IFRS_DUMMY* × *CRISIS_DUMMY* has a negative and significant coefficient, which supports H3b, which explains dividend payout policy with the agency cost theory.

4.4. Firms concerned about high agency costs

Panel B of Table 5 reports the results for sample firms that had agency cost concerns in the sample period 2003–2010.[7] These firms are mature, having accumulated more retained earnings than the sample median, high cash holdings, and higher cash ratios than the sample median. Based on the results for the full sample, the negative and significant coefficients of *IFRS_DUMMY* in Columns (1) and (2) suggest a decrease in the propensity to pay dividends by such firms with lower information asymmetry. *CRISIS_DUMMY* is insignificant, as in Column (2), but in Column (3), it is positive and significant at the 10% level, which suggests a higher propensity to pay during crisis years that in the pre-IFRS adoption period. In addition, *IFRS_DUMMY* × *CRISIS_DUMMY* has a negative and significant coefficient, revealing that, for firms concerned about high agency costs, the propensity to pay dividends

[5] -0.222 + (−0.574) = −0.796 for the period of 2000–2010, and − 0.349 + (−0.513) = −0.862 for the period of 2003–2010.

[6] We exclude variables *SIZE* and *TOBIN_Q* from these regressions since these variables are used to generate the subsample of firms concerned with high information asymmetry.

[7] We exclude *RET_EARNINGS* and *CASH_HOLDINGS* from these regressions because they are used to generate the subsample of firms concerned about high agency costs.

Table 5
Firms concerned about high information asymmetry and agency costs.

Panel A: Firms concerned about high information asymmetry

	Full sample			Matched sample		
	1	2	3	1	2	3
DIV_PAYMENT_LAG1	4.213 * **	4.207 * **	4.213 * **	4.292 * **	4.236 * **	4.242 * **
	(0.271)	(0.276)	(0.280)	(0.262)	(0.277)	(0.282)
SALES GROWTH	0.124 * *	0.115 * *	0.117 * *	0.216 * **	0.184 * **	0.190 * **
	(0.054)	(0.053)	(0.054)	(0.072)	(0.070)	(0.068)
PROFITABILITY	3.563 * **	3.517 * **	3.509 * **	3.232 * **	3.052 * **	3.040 * **
	(0.396)	(0.403)	(0.407)	(0.757)	(0.732)	(0.751)
RET_EARNINGS	0.915 * **	0.910 * **	0.917 * **	0.933 * **	0.920 * **	0.910 * **
	(0.181)	(0.179)	(0.181)	(0.229)	(0.228)	(0.223)
REPURCHASES	-1.566	-1.641	-1.791	-1.188	-1.585	-1.794
	(1.680)	(1.712)	(1.690)	(3.183)	(3.151)	(3.101)
CASH_HOLDINGS	-0.091	-0.087	-0.066	-0.136	-0.043	-0.02
	(0.230)	(0.230)	(0.224)	(0.498)	(0.517)	(0.516)
EQUITY_RATIO	1.031 * **	1.021 * **	1.032 * **	1.217 * **	1.224 * **	1.246 * **
	(0.170)	(0.167)	(0.172)	(0.371)	(0.349)	(0.349)
CF_VOLATILITY	-1.566 * **	-1.544 * **	-1.542 * **	-2.030 * *	-1.895 * *	-1.909 * *
	(0.481)	(0.479)	(0.485)	(0.902)	(0.858)	(0.852)
NEG_EARNINGS	-1.974 * **	-1.985 * **	-2.001 * **	-2.098 * **	-2.084 * **	-2.089 * **
	(0.089)	(0.087)	(0.092)	(0.255)	(0.249)	(0.261)
ADR_DUMMY	-0.434 * *	-0.438 * *	-0.444 * *	-0.598 *	-0.602 *	-0.596
	(0.173)	(0.176)	(0.177)	(0.346)	(0.357)	(0.363)
COTAX_CHANGE	0.172	0.172	0.164	0.611 * *	0.434	0.409
	(0.164)	(0.165)	(0.160)	(0.286)	(0.325)	(0.315)
GAAPACC_DIFF	-0.148 * **	-0.142 * **	-0.150 * **	-0.070 * *	-0.035	-0.042
	(0.015)	(0.013)	(0.012)	(0.033)	(0.029)	(0.029)
TREATED				1.220 * **	1.356 * **	1.345 * **
				(0.335)	(0.268)	(0.268)
IFRS_D. (TREATED*IFRS_D.)	-0.797 * **	-0.715 * **	-0.637 * **	-0.802 * *	-0.750 * **	-0.683 * **
	(0.130)	(0.117)	(0.097)	(0.312)	(0.189)	(0.163)
CRISIS_DUMMY		-0.176	0.182		-0.077	0.32
		(0.162)	(0.170)		(0.240)	(0.336)
IFRS*CRISIS(*TREATED)			-0.609 * *			-0.644 *
			(0.242)			(0.390)
CONSTANT	-0.082	-0.1	-0.03	-3.713 * **	-4.061 * **	-4.090 * **
	(1.076)	(1.069)	(1.073)	(0.826)	(0.746)	(0.751)
pseudo R^2	0.702	0.701	0.702	0.701	0.697	0.697
N	14,303	14,303	14,303	4348	4348	4348
COUNTRY FE	Yes	Yes	Yes	Yes	Yes	Yes
INDUSTRY FE	Yes	Yes	Yes	Yes	Yes	Yes
YEAR FE	Yes	No	No	Yes	No	No

Panel B: Firms concerned with high agency costs

	Full sample			Matched sample		
	1	2	3	1	2	3
DIV_PAYMENT_LAG1	4.052 * **	4.037 * **	4.043 * **	4.130 * **	4.111 * **	4.130 * **
	(0.288)	(0.292)	(0.292)	(0.291)	(0.298)	(0.307)
SALES GROWTH	0.266 * *	0.241 * *	0.245 * *	0.374 * **	0.348 * **	0.354 * **
	(0.106)	(0.106)	(0.106)	(0.124)	(0.126)	(0.124)
PROFITABILITY	3.685 * **	3.599 * **	3.592 * **	3.152 * **	3.079 * **	2.991 * **
	(0.529)	(0.539)	(0.533)	(0.795)	(0.792)	(0.764)
SIZE (LN_ASSESTS)	0.251 * **	0.258 * **	0.257 * **	0.191 * **	0.200 * **	0.197 * **
	(0.031)	(0.029)	(0.030)	(0.046)	(0.042)	(0.043)
REPURCHASES	-1.992	-2.413	-2.526	-1.599	-1.75	-1.832
	(2.350)	(2.232)	(2.231)	(4.256)	(4.118)	(4.127)
EQUITY_RATIO	1.431 * **	1.465 * **	1.459 * **	1.096 * **	1.113 * **	1.124 * **
	(0.367)	(0.350)	(0.348)	(0.356)	(0.326)	(0.332)
CF_VOLATILITY	-2.793 * **	-2.774 * **	-2.723 * **	-3.028 * **	-3.014 * **	-2.969 * **
	(0.783)	(0.793)	(0.787)	(0.899)	(0.910)	(0.909)
NEG_EARNINGS	-1.984 * **	-1.956 * **	-1.972 * **	-2.292 * **	-2.264 * **	-2.294 * **
	(0.171)	(0.154)	(0.165)	(0.239)	(0.214)	(0.229)
TOBIN_Q	-0.126 *	-0.115	-0.117 *	-0.150 * *	-0.143 * *	-0.142 * *
	(0.076)	(0.072)	(0.071)	(0.072)	(0.065)	(0.062)
ADR_DUMMY	-0.04	-0.052	-0.045	-0.166	-0.182	-0.178

(*continued on next page*)

Table 5 (*continued*)

Panel B: Firms concerned with high agency costs						
	(0.132)	(0.137)	(0.142)	(0.182)	(0.188)	(0.188)
COTAX_CHANGE	0.019	-0.128	-0.082	0.09	-0.056	0.014
	(0.211)	(0.217)	(0.201)	(0.368)	(0.353)	(0.341)
GAAPACC_DIFF	-0.038 * *	-0.037 * *	-0.046 * **	-0.120 * **	-0.115 * **	-0.113 * **
	(0.017)	(0.016)	(0.016)	(0.034)	(0.032)	(0.031)
TREATED				1.034 * *	1.108 * **	1.367 * **
				(0.497)	(0.422)	(0.415)
IFRS_D. (TREATED*IFRS_D.)	-0.566 * *	-0.526 * **	-0.425 * *	-0.432	-0.486 *	-0.378
	(0.249)	(0.201)	(0.206)	(0.352)	(0.286)	(0.294)
CRISIS_DUMMY		-0.098	0.267 *		-0.102	0.571 *
		(0.176)	(0.150)		(0.294)	(0.325)
IFRS*CRISIS(*TREATED)			-0.677 * **			-1.071 * **
			(0.213)			(0.385)
CONSTANT	-3.348 * **	-3.460 * **	-3.507 * **	-7.136 * **	-7.358 * **	-7.506 * **
	(1.004)	(0.945)	(0.959)	(1.311)	(1.321)	(1.328)
pseudo R^2	0.602	0.601	0.602	0.587	0.586	0.589
N	22,144	22,144	22,144	8501	8501	8501
COUNTRY FE	Yes	Yes	Yes	Yes	Yes	Yes
INDUSTRY FE	Yes	Yes	Yes	Yes	Yes	Yes
YEAR FE	Yes	No	No	Yes	No	No

Notes: This table reports the results from logistic regressions to determine the propensity of firms to pay dividends (based on firm-level characteristics) for the period 2003–2010. We use the annual sample medians of the book value of total assets (in USD) and Tobin's Q to identify firms concerned with high information asymmetry (Panel A), and the annual sample median of retained earnings to the total equity ratio and the cash to total assets ratio to identify firms concerned with high agency costs (Panel B). Standard errors reported in parentheses are clustered at the country level. All models include country-, industry-, and year-fixed effects. * **, * *, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. The definitions of all variables are given in Table 1.

is higher during crisis years than noncrisis years in the post-IFRS adoption period. This evidence is also consistent with the agency cost explanation.

The second section of Panel B of Table 5 reports the results for the matched sample of firms concerned about high information asymmetry. In Columns (1) and (2), the positive and significant coefficients of *TREATED* suggest that the treated mature and high-cash firms, on average, have a higher propensity to pay dividends than similar firms in non-IFRS-adopting countries. More interestingly, the coefficients of *TREATED* × *IFRS_DUMMY* are not significant in Column (1) and are only significant at the 10% level when we include the effect of the GFC in the model. They became insignificant again in Column (3). This finding implies that the propensity to pay dividends by firms concerned with high agency costs in IFRS-adopting countries is similar to that of firms in non-IFRS-adopting countries in the post-IFRS adoption period. Moreover, the positive and significant coefficient of *CRISIS_DUMMY* suggests that the propensity to pay dividends is higher at treated and control firms in the crisis years than in the pre-IFRS adoption period. In contrast, in the post-IFRS adoption period, *TREATED* × *IFRS_DUMMY* × *CRISIS_DUMMY* has a negative and significant coefficient, indicating a major decline in the propensity to pay dividends by firms during the crisis than in non-crisis years. This empirical evidence provides additional support for the agency cost explanation of dividend payout policy.

4.5. Firms that are not concerned about information asymmetry or agency costs

In this section, we test the changes in the propensity to pay dividends during the GFC, which occurs subsequent to the mandatory IFRS adoption, and then the combination of the two external shocks. The sample consists only of firms that are not included in the samples of firms concerned about information asymmetry or agency costs. The results are in Table 6.

The results for both the full sample and the matched sample reveal some differences from those in Table 5 for both types of firms. The IFRS effect alone is small for the full sample and disappears in the matched sample. The effect of GFC alone disappears in the full sample and is smaller in the matched sample. More important, we find no effects from any of these variables in Column 3 in the two samples. Moreover, in both samples, *IFRS_DUMMY* × *CRISIS_DUMMY* and *TREATED* × *IFRS_DUMMY x CRISIS_DUMMY* have a negative and significant coefficient, which suggests that the propensity to pay dividends is lower during the crisis years than in the noncrisis years in the post-IFRS adoption period. However, these combined effects are smaller than the joint effects reported in previous studies. Therefore, we conclude that information asymmetry and agency cost explanations become more important when firms' life cycles are considered.

Table 6
Firms that are not concerned about information asymmetry or agency costs.

	Full sample			Matched sample		
	1	2	3	1	2	3
DIV_PAYMENT_LAG1	4.287 * **	4.281 * **	4.288 * **	4.221 * **	4.205 * **	4.206 * **
	(0.197)	(0.197)	(0.200)	(0.199)	(0.195)	(0.196)
SALES GROWTH	0.135 * **	0.123 * **	0.124 * **	0.133 * *	0.120 * *	0.120 * *
	(0.035)	(0.034)	(0.034)	(0.060)	(0.056)	(0.057)
PROFITABILITY	4.317 * **	4.131 * **	4.123 * **	5.374 * **	5.329 * **	5.300 * **
	(1.144)	(1.135)	(1.126)	(0.824)	(0.800)	(0.805)
REPURCHASES	4.355 * *	3.590 *	3.516 *	-1.846	-2.168	-2.203
	(2.165)	(2.139)	(2.136)	(2.796)	(2.798)	(2.786)
EQUITY_RATIO	0.960 * *	1.002 * *	0.982 * *	1.009 * *	1.010 * *	1.004 * *
	(0.467)	(0.441)	(0.435)	(0.490)	(0.468)	(0.465)
CF_VOLATILITY	-4.125 * **	-4.144 * **	-4.148 * **	-4.735 * **	-4.649 * **	-4.636 * **
	(1.020)	(1.019)	(1.007)	(0.994)	(1.012)	(1.005)
NEG_EARNINGS	-2.046 * **	-2.051 * **	-2.058 * **	-1.963 * **	-1.962 * **	-1.967 * **
	(0.087)	(0.084)	(0.090)	(0.098)	(0.098)	(0.101)
ADR_DUMMY	0.437 * **	0.418 * **	0.423 * **	0.572 * **	0.576 * **	0.583 * **
	(0.097)	(0.103)	(0.100)	(0.147)	(0.148)	(0.147)
COTAX_CHANGE	0.011	-0.035	-0.067	0.065	-0.056	-0.071
	(0.097)	(0.116)	(0.106)	(0.127)	(0.137)	(0.131)
GAAPACC_DIFF	-0.123 * **	-0.117 * **	-0.121 * **	-0.097 * **	-0.098 * **	-0.098 * **
	(0.013)	(0.015)	(0.015)	(0.008)	(0.008)	(0.008)
TREATED				0.124	0.16	0.188
				(0.137)	(0.125)	(0.120)
IFRS_D. (TREATED*IFRS_D.)	-0.284 * **	-0.210 * *	-0.098	-0.068	-0.112	-0.059
	(0.098)	(0.104)	(0.102)	(0.133)	(0.119)	(0.107)
CRISIS_DUMMY		-0.212	0.056		-0.294 * *	-0.13
		(0.160)	(0.137)		(0.145)	(0.159)
IFRS*CRISIS(*TREATED)			-0.573 * **			-0.320 *
			(0.181)			(0.192)
CONSTANT	-0.827 * *	-0.869 * **	-0.835 * **	-1.277 * **	-1.288 * **	-1.305 * **
	(0.326)	(0.321)	(0.321)	(0.288)	(0.289)	(0.281)
pseudo R^2	0.631	0.631	0.631	0.617	0.616	0.616
N	42,074	42,074	42,074	15,300	15,300	15,300
COUNTRY FE	Yes	Yes	Yes	Yes	Yes	Yes
INDUSTRY FE	Yes	Yes	Yes	Yes	Yes	Yes
YEAR FE	Yes	No	No	Yes	No	No

Notes: This table reports the results from logistic regressions to determine the propensity of firms to pay dividends (based on firm-level characteristics) for the period 2003–2010. Firms concerned about high information asymmetry and high agency costs are excluded. Standard errors reported in parentheses are clustered at the country level. All models include country-, industry-, and year-fixed effects. * ** , * *, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. The definitions of all variables are given in Table 1.

4.6. Robustness check

We estimate the propensity to pay dividends as the dependent variable in our main analysis. The effects of a reduction in information asymmetry and agency costs should be observed not only at firms that pay dividends but also at firms that increase or decrease dividends. Therefore, we estimate the probability of an annual increase in dividend payments to provide robust results. We define a dummy variable for the increase in dividend per share in a particular year compared to the dividend per share in the previous year.

We report the results using matched samples for the two periods in Table 7. The estimated coefficients of TREATED are positive and significant, indicating that our treated firms, on average, increased their dividend payments more frequently than the control firms, especially during shorter sample periods around the IFRS adoption. However, we do not observe a significant effect from a reduction in information asymmetry, as the coefficients of *TREATED* × *IFRS_D* are insignificant. In contrast, the treated firms have a significantly lower propensity to increase dividends than the control firms during the GFC (2008 and 2009) than in other years. These findings support the notion that the agency cost explanation is better than the information asymmetry explanation. Finally, the coefficient of *TREATED* × *IFRS_DUMMY* × *CRISIS_DUMMY* is negative and significant, suggesting that, in the post-IFRS period, the difference between the treated and control firms with respect to the change in the propensity to increase dividends is greater during the GFC than in noncrisis years. This evidence provides additional support for the dominant role played by a decrease in the agency costs of FCF in explaining dividend payout policy.

Table 7
The effects of information asymmetry and agency cost on dividends increase.

	2000–2010			2003–2010		
	1	2	3	1	2	3
DIV_PAYMENT_LAG1	0.768 * **	0.758 * **	0.763 * **	0.833 * **	0.833 * **	0.838 * **
	(0.240)	(0.236)	(0.236)	(0.234)	(0.231)	(0.230)
SALES GROWTH	0.264 * **	0.266 * **	0.264 * **	0.288 * **	0.298 * **	0.297 * **
	(0.027)	(0.040)	(0.038)	(0.030)	(0.042)	(0.041)
PROFITABILITY	7.291 * **	7.222 * **	7.203 * **	6.546 * **	6.542 * **	6.522 * **
	(1.228)	(1.331)	(1.325)	(1.211)	(1.314)	(1.310)
SIZE (LN_ASSESTS)	0.178 * **	0.177 * **	0.177 * **	0.189 * **	0.182 * **	0.182 * **
	(0.014)	(0.020)	(0.020)	(0.012)	(0.018)	(0.018)
RET_EARNINGS	0.179 * **	0.178 * **	0.174 * **	0.137 * *	0.126 * *	0.122 * *
	(0.057)	(0.061)	(0.061)	(0.055)	(0.055)	(0.055)
REPURCHASES	0.202	0.295	0.166	0.332	0.385	0.276
	(1.138)	(1.096)	(1.066)	(0.908)	(0.867)	(0.844)
CASH_HOLDINGS	-0.142	-0.201	-0.194	-0.119	-0.158	-0.156
	(0.175)	(0.211)	(0.208)	(0.147)	(0.170)	(0.168)
EQUITY_RATIO	0.146	0.169	0.16	0.133	0.123	0.116
	(0.108)	(0.110)	(0.109)	(0.112)	(0.118)	(0.117)
CF_VOLATILITY	-2.533 * **	-2.538 * **	-2.545 * **	-2.121 * **	-2.198 * **	-2.205 * **
	(0.372)	(0.332)	(0.330)	(0.339)	(0.348)	(0.346)
NEG_EARNINGS	-0.935 * **	-0.962 * **	-0.964 * **	-0.872 * **	-0.880 * **	-0.883 * **
	(0.065)	(0.061)	(0.061)	(0.072)	(0.068)	(0.067)
TOBIN_Q	0.053 *	0.077 * **	0.077 * **	0.054	0.069 * *	0.070 * *
	(0.027)	(0.028)	(0.028)	(0.034)	(0.032)	(0.032)
ADR_DUMMY	-0.108	-0.122	-0.118	-0.108	-0.104	-0.1
	(0.103)	(0.107)	(0.107)	(0.097)	(0.104)	(0.103)
COTAX_CHANGE	0.166	0.142	0.155 *	0.149	0.105	0.117
	(0.106)	(0.109)	(0.082)	(0.109)	(0.101)	(0.085)
GAAPACC_DIFF	-0.073 * **	-0.070 * **	-0.070 * **	-0.046 * **	-0.045 * **	-0.045 * **
	(0.011)	(0.012)	(0.012)	(0.009)	(0.009)	(0.010)
TREATED	0.191 * **	0.038	0.089	0.351 * **	0.286 * **	0.336 * **
	(0.071)	(0.068)	(0.085)	(0.076)	(0.071)	(0.074)
TREATED*IFRS_D.	-0.273 * **	0.003	0.078	-0.208 * *	-0.097	-0.041
	(0.078)	(0.056)	(0.057)	(0.092)	(0.075)	(0.078)
CRISIS_DUMMY		-0.450 * **	-0.215 * **		-0.513 * **	-0.324 * **
		(0.119)	(0.039)		(0.094)	(0.049)
TREATED*IFRS*CRISIS			-0.510 * **			-0.402 * **
			(0.087)			(0.095)
CONSTANT	-3.377 * **	-3.127 * **	-3.177 * **	-3.737 * **	-3.496 * **	-3.547 * **
	(0.572)	(0.602)	(0.623)	(0.589)	(0.652)	(0.671)
pseudo R^2	0.203	0.2	0.201	0.193	0.191	0.192
N	35,905	35,905	35,905	27,292	27,292	27,292
COUNTRY FE	Yes	Yes	Yes	Yes	Yes	Yes
INDUSTRY FE	Yes	Yes	Yes	Yes	Yes	Yes
YEAR FE	Yes	No	No	Yes	No	No

Notes: This table reports the results from logistic regressions to determine the propensity of firms to increase dividends by matched sample. Standard errors reported in parentheses are clustered at the country-level. All models include country-, industry-, and year-fixed effects. * ** , * *, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. The definitions of all variables are given in Table 1.

5. Conclusion

Firms' payout policies are highly important for managers and investors alike. When firms pay dividends, the decrease in FCF reduces investors' concerns about agency problems. However, at the same time, it reduces managers' financial flexibility in using these FCF for investment opportunities. When information asymmetry between managers and investors is high, it is difficult to find an optimal tradeoff between these two situations. As the mandatory adoption of IFRS was intended to improve the information environment, it could reduce the agency costs of FCFs while also reducing the need for managers to hold on to FCF. Nevertheless, empirically disentangling information asymmetry from agency cost effects is challenging, as both are partially endogenous and might also depend on the life-cycle stage of a firm. Our goal in this study is to shed more light on which of these theories is better at explaining firms' payout policies. In our analysis, we introduce the GFC in 2008–2009 as an exogenous shock that negatively affected and reduced firms' FCFs, ultimately reducing agency costs.

Using the full and matched samples, we first found that the propensity of firms to pay dividends declined after our two external shocks, which should have reduced information asymmetry (mandatory adoption of IFRS) and agency costs (the GFC). This empirical evidence indicates that the propensity to pay dividends is explained by the lower information asymmetry and agency cost theories. However, these results alone do not clearly differentiate the role of agency cost from the primary effect of information asymmetry.

Therefore, to disentangle the role of agency cost from the role of information asymmetry, we incorporate the combined effects of these two external shocks by introducing interaction effects. Our empirical evidence suggests that, in the post-IFRS adoption period, the decrease in the propensity to pay dividends is greater during the crisis years than in noncrisis years. This finding is not consistent with the expectation from a direct information asymmetry effect, which should lead to an increase or a smaller decrease in the propensity to pay dividends. Therefore, the results clearly suggest that agency costs play a more dominant role than information asymmetry in explaining dividend payout policies.

Next, we examine these relationships at firms that have either high information asymmetry, high agency costs, or neither of them. This analysis focuses on the different stages in a firm's life cycle (Kalay, 2014) to identify the role of information asymmetry and agency costs. The results for firms with high information asymmetry are similar to those from the analysis using the full sample. However, the results for firms concerned about high agency costs are noteworthy. First, the propensity to pay dividends is higher in crisis years than in the pre-IFRS adoption period. This outcome was expected for firms with high agency costs. Second, and most important, an additional substantial decline in the propensity to pay dividends is found during the crisis years than in noncrisis years during the post-IFRS adoption period. This empirical evidence provides further support for the notion that agency costs are more likely to explain dividend payout policy.

This study contributes to the literature by designing an empirical framework that addresses the question of which of the two FCF-centric theories, information asymmetry or agency cost, is better suited to explaining adjustments in payout policies. Our analysis uses a major shock and economic downturn, the GFC in 2008–2009. However, this event limits our analysis to the period 2000–2010, because by 2005 most countries had already adopted IFRS.

Overall, a firm's payout policy remains a key issue in corporate finance and corporate governance, even as new trends need to be taken into consideration and shareholders' preferences may change in the future. Specifically, the dramatic growth in institutional investors, passive investment vehicles (exchange-traded funds (ETFs) and index funds) and proxy advisers (Institutional Shareholder Services group of companies (ISS) and Glass Lewis) after the financial crisis as well as the Covid-19 pandemic might affect payout policies due to risk preferences, tax implications, government restrictions, and so forth. Moreover, shareholder activists typically demand substantial increases in payouts for different reasons, whereas improvements in stakeholder governance and environmental, social, and governance (ESG) demands may have the opposite effect. The results in this study can serve as a starting point for the development of new research that examines these factors as well as the current trends and new developments that might have an impact on dividend payout policies in the future.

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Appendix. : PSM Statistics

Comparison of the mean values of the variables used in PSM.

	Treated group in IFRS countries (N = 2086)	Control group in non-IFRS countries (N = 2086)	Differences
Variables	Mean	Mean	Mean
SIZE (LN_ASSESTS)	12.240	12.209	0.031
RET_EARNINGS	0.317	0.312	0.005
CASH_HOLDINGS	0.147	0.155	-0.007
TOBIN_Q	1.563	1.580	-0.017

Summary of the distribution of the abs (bias).

Before matching				
	Percentiles	Smallest		
1%	3.9408	3.9408		
5%	3.9408	8.6679		
10%	3.9408	13.0809		
25%	6.3044	28.8989		
50%	10.8744		Mean	13.6471
		Largest	Std. dev.	10.8312
75%	20.9899	3.9408		
90%	28.8989	8.6679	Variance	117.3138
95%	28.8989	13.0809	Skewness	0.7602
99%	28.8989	28.8989	Kurtosis	2.0539

After matching

	Percentiles	Smallest			
1%	0.8704	0.8704			
5%	0.8704	1.5145			
10%	0.8704	1.8245			
25%	1.1924	4.8048			
50%	1.6695		Mean		2.2535
		Largest	Std. dev.		1.7466
75%	3.3146	0.8704			
90%	4.8048	1.5145	Variance		3.0507
95%	4.8048	1.8245	Skewness		0.9735
99%	4.8048	4.8048	Kurtosis		2.2137

Sample	Pseudo R2	LR chi2	p > chi2	MeanBias	MedBias
Raw	0.018	246.8	0	13.6	10.9
Matched	0	2.45	0.653	2.3	1.7

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