Corporate dividend decisions and dividend smoothing: New evidence from an empirical study of Turkish firms

Abstract

Purpose – This paper investigates the impact of regulations, reforms and legal environment on dividend policy in a different institutional setting. Particularly, it examines the firm-level cash dividend behaviour of publicly-listed firms in Turkey in the post-2003 period, since there were major economic and structural reforms as well as significant regulatory changes of dividend payout rules imposed by the supervisory bodies.

Design/methodology/approach – The paper focuses on a recent large panel dataset of 264 Istanbul Stock Exchange (ISE)-listed firms over a ten-year period 2003-2012. First, it employs a modified specification of Lintner's (1956) partial adjustment model for analysis regarding target payout ratio and dividend smoothing. Second, it performs a logit model for analysis in identifying the link between financial characteristics and the likelihood of paying dividends.

Findings – The results show that ISE firms now follow the same determinants as suggested by Lintner. They, indeed, have long-term payout ratios and adjust their cash dividends by a moderate level of smoothing, and therefore adopt stable dividend policies (although less stable policies compared to their counterparts in the developed US market) as a signalling mechanism over the period 2003-2012. Moreover, the results also report that ownership structure concentration affects the target payout ratio and dividend smoothing in the Turkish market. In addition, the results further show that more profitable, more mature and larger sized ISE firms are more likely to pay cash dividends, whereas ISE firms with higher investment opportunities and more debt are less likely to distribute cash dividends in the post-2003 period.

Originality/value – To the best of author's knowledge, this paper is the first major research that examines the implications of reforms and regulations on cash dividend payments and dividend smoothing over time in Turkey during its market integration process in the post-2003 period.

Key words Dividend policy, dividend smoothing, Turkey

Paper type Research paper

1. Introduction

Dividend policy has attracted a signifcant amount of attention in corporate finance literature. Miller and Modigliani (M&M) (1961) assert that, under the conditions of a perfect capital market, a managed dividend policy does not affect the firm value and therefore it is irrelevant. However, many scholars argue that real world capital markets are subject to various market imperfections (e.g. information asymmetries, differential taxes, transaction costs and agency problems) and suggest that dividends may be used as a very important mechanism to minimise such imperfections. Indeed, Lintner (1956) observes that US managers follow extremely deliberate (managed) dividend policies, contrary to M&M's prediction. In his pioneering study, Lintner detects that US managers tend to smooth dividends relative to earnings; they only increase their dividend payments when they believe that earnings can sustain higher dividend levels permanently, and are reluctant to cut dividends unless adverse circumstances are likely to persist, since dividend cuts are bad signals to the market.

Nevertheless, dividend policy decisions are not always solely dependent on managers' judgement. This is because factors such as regulations and legal environments, institutional settings, financial crises, and trends in macro-economy may also have implications on a firm's dividend policy (Glen et al, 1995; La Porta et al., 2000; Aivazian et al., 2003a; 2003b). For example, Aivazian et al. (2003a) and Dewenter and Warther (1998) argue that dividend payments may be a more useful pre-commitment device to reduce agency problems and to signal insider information in the "Anglo-Saxon" capital markets. For instance, in the US and the UK, where the ownership structure is generally dispersed among small shareholders and the control remains concentrated in the hands of managers, corporations rely on arm's length contracting by "uninformed" and dispersed outside investors. In contrast, the "Continental-German-Japanese" banking model develops close ties between managers and investors, because bank debt is a contract with an informed investor (lender) who has access to confidential corporate information (due to direct communication, such as obtaining quarterly financial information in a standardised form or regular site visits) which is not available in the capital market. Consequently, they suggest that there are relatively lower levels of information asymmetry and agency conflicts in bank centric markets, and hence managed dividend policies might not be vital in these kinds of economies.

Furthermore, there is an evidence that in some countries with poor legal environment and weak minority shareholders' protection, typically emerging market (e.g., Brazil, Chile, Colombia, Greece, Philippines, Venezuela and Turkey), governments and regulators have

chosen to force publicly-listed firms to pay dividends in order to protect minority shareholders and creditors. Therefore, by dictating a minimum level of dividends (a mandatory dividend policy) that firms must adhere to, regulators have attempted to convince minority investors that they will not be expropriated (at least not entirely) and instead encourage them to invest in equity markets (Glen et al., 1995; La Porta et al., 2000; Aivazian, 2003a). This highlights how important the institutional setting is to dividend policy and implies that different institutional and financial environments may have different effects on a firm's dividend payment decisions.

Accordingly, our purpose is to investigate the implications of regulations, reforms and legal environment on dividend policy in a different institutional setting. We consider firm-level cash dividend behaviour of publicly-listed firms in Turkey over the period 2003-2012. It is because Turkey provides an interesting set up to study the dividend policy behaviour of an emerging market (a civil law originated) which implemented major economic and structural reforms (common laws) starting with the fiscal year 2003. There were also significant changes in regulatory framework of cash dividend policy rules imposed by the supervisory bodies in the post-2003 period.

The paper proceeds as follows: Section 2 provides an overview of the institutional background and dividend regulations in Turkey. Section 3 reviews the previous studies and develops the research hypotheses. Section 4 describes the methodology. Section 5 illustrates the empirical results and Section 7 concludes.

2. Institutional setting and dividend regulations in the Turkish market

Turkey had a very late start in the liberalisation of its economy and the establishment of its stock market, namely the Istanbul Stock Exchange (ISE), whose history only dates back to 1986, compared to the developed stock exchanges with hundreds of years of historical development (Adaoglu, 2000; Aksu and Kosedag, 2006). Public corporations listed on the ISE were subject to the first mandatory dividend policy, which was put into effect by the Capital Markets Board (CMB) of Turkey[1], when it first started to operate in 1986. According to the first regulation on dividend payments, the ISE-listed firms were obliged to distribute at least 50% of their distributable income as a cash dividend - this was known as the *first dividend* and other types of payouts or maintaining profits as retained earnings were not legally possible without paying the *first dividend.*

[1] The Capital Markets Board (CMB) of Turkey is the sole regulatory and supervisory authority in charge of the securities markets in Turkey. The CMB was established in 1982 as a statutory public legal entity with administrative and financial autonomy, empowered by the Capital Markets Law (CML) that was enacted in 1981, in order to maintain secure, transparent, efficient, fair and competitive capital markets, and to protect rights and interests of investors (CMB, 2003).

Adaoglu (1999; 2000) states that the reason behind the first mandatory dividend policy imposed by the CMB of Turkey was, probably, to protect minority shareholders' right by providing them satisfactory levels of dividends. This is because Turkey experienced a poor culture of corporate governance coupled with the lack of appropriate transparency and disclosure practices, with very poor minority shareholders' protection until the early 2000s (La Porta et al, 1997; Aksu and Kosedag, 2006). Besides, corporate ownership in Turkey is highly concentrated by families who generally owned business groups, which were affiliated with industrial and financial companies and subsidiaries that organised under the legal form of a *holding company.* The controlling families often attempted to use pyramidal corporate structures or even more complicated web of inter-corporate equity linkages and dual class shares to further enhance the control on their companies at the expense of other shareholders (Glen et al, 1995; Yurtoglu, 2003; Sevil et al, 2012).

Furthermore, prior research (Aivazian et al, 2003a; 2003b; Ararat and Ugur, 2003; Erturk, 2003) indicates that Turkey had a bank-based financial system where private sector banks dominated the market and were mainly part of bigger family-owned *holding companies*. The popularity of *holding company* structures led the Turkish financial system to operate around large family-controlled business groups with a group-owned bank. Hence, families had control over many banks that belonged to their business groups, and also had control over their banks' lending decisions. This resulted in business groups obtaining much of their finance from their own banks - in other words allowing non-arm's length party transactions (Yurtoglu, 2003; Aksu and Kosedag, 2006).

As previously mentioned, Aivaizan et al. (2003a) and Dewenter and Warther (1998) argue that dividend payments may be a more useful pre-commitment device to reduce agency problems and to convey information in markets that are greatly dependent on arm's length transactions. Considering the nature of the ISE-listed firms' corporate structures, which were highly concentrated by large controlling families and characterised by bank-centred finance as well as close owner-bank-firm relations, one can easily deduce that cash dividends were not used to signal favourable insider information nor were they used as a disciplinary device, and managers did not much care about setting stable dividend policies in the early stages of the Turkish market. Applying Lintner's (1956) model, the studies of Adaoglu (2000) and Aivazian et al (2003a), which were conducted in early periods in Turkey (the periods 1985-1997 and 1983-1990, respectively) demonstrated that ISE firms did not smooth their cash dividends and thus had unstable cash dividend polices; cash dividends were solely determined by current year earnings, as forced by the *first dividend* rule, and any volatility in earnings of the firms was directly reflected in the levels of current cash dividends.

However, Turkey had undergone major economic and structural reforms in the early 2000s. The CMB of Turkey attributed great importance to improve communications with investors, issuers and other institutions to ensure that markets were functioning in a safer, more transparent and more efficient manner in accordance with regulations that were adopted in harmony with international norms and developments (CMB, 2003) - some of the important improvements were the adoption of the International Financial Reporting Standards (IFRS), the publication of the CMB's Corporate Governance Principles, the introduction of the Banking Sector Restructuring Program and the Regulation on Establishment and Operations of Banks (to minimise credit risk concentration within a business group and avoid insider trading), and the accelerated privatization of the State Economic Enterprises.

More importantly, the ISE-listed firms have been subject to a significantly different set of dividend policy regulations after the implementation of major reform in 2003. The CMB introduced the second mandatory dividend policy in 2003, which was much more flexible compared to the first one and only forced the ISE firms to pay at least 20% of their distributable income as a *first dividend* but the listed firms did not have to pay the *first dividend* entirely in cash. Instead, they had the option to distribute it in cash or stock dividends or a mixture of both, which was then subject to the board of directors' ultimate decision. Further, for the fiscal year 2004, the CMB increased the minimum percentage of mandatory dividend payments for the ISE-listed firms from 20% to 30%, which also stayed at this level for the fiscal year 2005. Then, the minimum percentage of mandatory dividend payment level was again reduced to 20% in the fiscal year 2006 and remained at this level for the fiscal years 2007 and 2008. Nonetheless, from the fiscal year 2009 and onwards (2010, 2011 and 2012), the CMB decided to not determine a minimum dividend payout ratio and abolished mandatory minimum dividend payment distribution requirement for the ISE firms, which provided total freedom for the ISE-listed firms to make their own dividend policy decisions to pay or not to pay, with the requirement that any decisions made regarding dividends should be publicly disclosed.

3. Prior studies and research hypotheses

In a pioneering study, Lintner (1956) develops a mathematical model based on his extensive in-depth interviews with US managers to test for the stability of cash dividend payments. His model reveals that firms set current dividend payments in line with their current earnings and previous year dividend payments, and they make partial adjustments to a target payout ratio and do not match immediately with the earnings changes. In fact, various researchers from developed and developing countries have been strongly supportive

of Lintner's findings and reported consistency of results across many markets and different periods of time. For example, early studies such as Darling (1957), Brittain (1964) and Fama and Babiak (1968) re-evaluate and extend the Lintner model, by adding supplementary variables or undertaking more comprehensive approaches, and they all confirm the original findings of Lintner that US companies follow stable dividend policies.

McDonald et al. (1975) examine the dividend, investment and financing decisions of French firms, and report that dividends of French firms are well-explained by current profit and lagged dividends in the dividend model of Lintner, whereas investment and financing variables appear to be insignificant in the dividend equation. Chateau (1979) tests the partial adjustment model on large Canadian manufacturing firms, and finds that Canadian corporations follow stable dividend policies – especially, they are more conservative compared to American firms when it comes to short-term dividend strategies although they have a higher average payout ratio. Dewenter and Warther (1998) compare dividend polices of US and Japanese firms, and report that, using the Lintner model, US dividends are smoother than Japanese dividends and Japanese firms reduce dividends in response to poor performance more quickly than US firms.

A number of studies have investigated dividend policy behaviour in different developing countries by applying Lintner's (1956) explanation. For instance, Mookerjee (1992) shows that Lintner model explains dividend behaviour in India. Pandey's (2001) research reveals that although Malaysian firms have low smoothing and less stable dividends (higher adjustment factors), they rely both on current earnings and past dividends. In another study, Al-Najjar (2009) also reports that the Lintner model successfully explains Jordanian markets' dividend behaviour, and further suggests that Jordanian firms have target payout ratios and they partially adjust dividends to their target but relatively faster than those in US (developed) market. Chemmanur et al. (2010) compare dividend policies of Hong Kong firms and US firms. Their study indicates that dividend payments in Hong Kong are more closely related to current year earnings and thus the extent of dividend smoothing by Hong Kong firms is considerably less than those in the US. Furthermore, Al-Ajmi and Abo Hussain (2011) show that current dividends are determined by lagged dividends and current earnings as proposed by Lintner in Saudi Arabia; however, Saudi firms have more flexible dividend policies since they act quickly to increase dividend payments and are willing to cut or skip dividends when earnings decline. Al-Malkawi et al. (2014) examine dividend smoothing in Oman, and find that Omani firms adjust their dividends toward their target payout ratio gradually, more interestingly with a relatively low speed of adjustment, as compared to other firms in developed and emerging economies.

However, Adaoglu (2000) reports that publicly-listed firms in Turkey do not smooth their dividends. Aivazian et al (2003a) find that the Lintner model does not work very well for the eight emerging market (Turkey, Thailand, India, Pakistan, Jordan, Malaysia, South Korea, Zimbabwe) firms, whereas it still works well for their US counterparts. Despite these early studies conducted in Turkey report inconsistent results with the Lintner argument, possibly due to the mandatory payout requirement of at least 50% of earnings as a cash dividend, we, however, argue that there are reasons suggesting that the ISE firms may adopt traditional Lintner style managed dividend policies in the post-2003 period.

First, as already stated, Turkey has shown a serious effort by implementing various financial and structural reforms to improve its market economy and converge with the global world-markets. Accordingly, this period (2003-2012) has experienced a rapid growth in market capitalisation and trading volume, and especially has attracted a significant amount of foreign investment (CMB, 2003; 2012). Considering the significant flexibility provided in setting their dividend policies (compared to the first mandatory dividend payout rule) during the period 2003-2008 and even the total freedom granted by the CMB (since not determining any compulsory dividend payment requirement starting with 2009), the ISE-listed firms have begun making their own dividend policy decisions. This has also allowed investors to interpret dividend policies of ISE firms efficiently in reflecting their judgements in the share prices (Kirkulak and Kurt, 2010). Hence, one can argue that these recent developments may have important effects on ISE firms' corporate financial policies, especially their dividend policy decisions. Because, ISE managers may then use cash dividends as a credible sign to convey their insider information to both foreign and national investors, and are likely to smooth their dividend payment stream to strengthen the credibility of dividends reflecting their firms' good financial performance.

Moreover, Turkey had serious issues with insider lending (in other words non-arm's length transactions) within business groups owned by families in early stages. This, indeed, reduced the need for dividend signalling and stability, and the role of dividends as a disciplinary mechanism in the Turkish market. Additionally, heavily regulated mandatory dividend policy requirement at the same time did not give the ISE firms many options to effectively use dividend policy. Nevertheless, considering the CMB's severe amendments in preventing insider trading as a source of financing and considerably relaxed divided policy regulations in early 2000s, the ISE have turned to the equity market with greater intensive for more transparent financing with more flexibility in making their own dividend policies. Hence, these are other reasons suggesting that Lintner style dividend policies might be adopted by the ISE managers. Besides, there is substantial evidence (Mookerjee, 1992; Pandey, 2001;

Al-Najjar, 2009; Chemmanur et al., 2010; Al-Ajmi and Abo Hussain, 2011; Al-Malkawi et al., 2014) that shows support for the Lintner model in explaining dividend behaviour in various emerging economies – yet they generally report higher adjustment factors, hence lower smoothing and less stable dividend policies compared to developed countries. Therefore, we hypothesise:

H1: Firms have their target payout ratios and adjust their dividends by dividend smoothing (consistent with the Lintner model) in the post-2003 period in Turkey.

Although the implementation of various major economic and structural reforms has improved in many areas in Turkish corporate governance, transparency and disclosure practices in the post-2003 period, the concentrated ownership structure is still prevailing form in Turkey, where families dominate its capital market with the existence of other large shareholders – especially, foreign investors followed by financial institutions and the state (Caliskan and Icke, 2011; Sevil et al., 2012; Al-Najjar and Kilincarslan, 2016). Therefore, ownership structure becomes critical since the related dividend literature suggests that large shareholders affect firms' dividend policies.

Prior research shows mixed results on the impact of large shareholders on dividend policy. For instance, Gugler and Yurtoglu (2003) find a negative correlation between the largest shareholder's ownership and dividend policy, and Khan (2006) also reports that ownership concentration negatively associates with dividend payouts, whereas Kouki and Guizani (2009) present evidence that firms with concentrated ownership distribute higher dividends. Faccio et al. (2001) detect that the existence of multiple large shareholders increases dividend payments in Western Europe but decreases in East Asia, thus implying that other large shareholders attempt to minimise the expropriation activity of the controlling shareholders in Europe, while they tend to exacerbate it in Asia. In a very recent study, Al-Najjar and Kilincarslan (2016) find that family owners do not seem to expropriate through dividends and cash dividends are not used as a monitoring mechanism by investors in Turkey. Differently from the mentioned studies, our aim, however, is to identify how ownership structure affects the target payout ratio and dividend smoothing in Turkey. This is because, we conjecture that firms' concerns about the dividend stability significantly differ based on the type and the existence of large shareholders.

La Porta et al. (2000) posit that dividends are the substitutes for legal protection in emerging countries with poor institutional settings and weak minority shareholders' protection (*the substitute model of dividends)* - a reputation for good treatment of shareholders is worth the most in these economies, and by paying dividends, controlling

shareholders return profits to investors, which reduce the possibility of expropriation of wealth from others, therefore establishing a good reputation. In this case, steady dividend payments might also be employed by the family-controlled ISE firms as a reputation mechanism as well as an indication of good financial performance to attract capital during the post-2003 market integration period. Hence, we hypothesise:

H2a: Family-controlled firms are likely to have relatively higher target payouts and pay smoothed dividends in the post-2003 period in Turkey.

There are other types of blockholders (rather than family owners) that may take several distinct forms such as foreign shareholders, the state and financial institutions ownership. According to Grossman and Hart (1980), Demsetz and Lehn (1985) and Shleifer and Vishny (1986), large shareholders have better incentives and ability to act as an effective monitoring mechanism on the management when the legal protection does not provide enough control rights to minority investors. The existence of such large shareholders can mitigate the free-rider problem of monitoring managers and the shareholders conflict, which minimises the agency problems and consequently reducing, in general, the need for paying cash dividends. Thus:

H2b: Firms with high prevalence of non-family blockholders are likely to have low target payouts and pay unsmoothed dividends in the post-2003 period in Turkey.

The downside of ownership concentration is that the interests of large shareholders and minority owners might not be the same. If this is the case, large shareholders may attempt to generate private benefits of control that are not shared with outside shareholders and hence exacerbating agency cost problems by expropriating the wealth from minority owners (Johnson et al., 2000; Mork and Yeung, 2003; Villalonga and Amit, 2006). Aforementioned, dividends payments can play an important role in controlling the conflict of interest between large and minority shareholders, since dividends guaranty a pro-rata cash distribution to all shareholders and limit corporate funds from large shareholders' control. Accordingly, we predict that although the existence of other non-family blockholders may reduce the importance of dividends as a disciplining mechanism and the need for dividend stability, family-controlled firms will still attempt to use dividends as a reputation device for fair treatment for minority owners when their firms are highly concentrated. Therefore:

H2c: Family-controlled firms with other non-family blockholders are likely to have high target payouts and pay moderately smoothed dividends in the post-2003 period in Turkey.

Furthermore, in widely held firms, where ownership structure is dispersed among small shareholders, corporate managers are in the controlling positions. Since they are the insiders who control corporate assets, managers may misuse these resources at the expense of outside shareholders due the absence of effective monitoring, which is known as the principal-agent conflict. Nevertheless, dividend payments can be used to lessen these kinds of agency problems by reducing free cash flows and forcing firms to enter the external capital markets for additional funding, thus increase monitoring by the market (Easterbrook, 1984; Jensen, 1986). Indeed, previous studies (e.g., Rozeff, 1982; Moh'd et al., 1995; La Porta et al., 2000; Farinha, 2003) generally show that minority shareholders desire higher dividend payments to increase dividend-induced capital market monitoring and reduce what is left for expropriation. Hence, we hypothesise:

H2d: Firms with dispersed ownership structures are likely to have higher target payouts and pay unsmoothed dividends in the post-2003 period in Turkey.

Corporate dividend policy literature suggests that there is a direct link between financial characteristics of a firm and its dividend policy decisions. In this respect, not surprisingly, we conjecture that the market integration process of Turkey, especially these major regulatory developments as explained, might lead the financial characteristics of ISE firms to significantly affect their dividend policies. While the Lintner model is expected to be valid in explaining dividend policy behaviour in Turkey, it does not indicate how financial characteristics affect dividend payments of the ISE firms. Therefore, we will investigate the effects of various fundamental financial factors on dividend policy decisions, in line with the prior research.

First, it is argued that profitability is one of the most important determinants of dividend policy and empirical studies generally report a positive relationship between firm's profitability and dividend payments (Fama and French, 2001; Aivazian et al., 2003b; Ferris et al., 2006). Considering the much more flexible dividend payment regulations in the post-2003 period, we posit that highly profitable ISE firms are more likely to pay cash dividends to convey their better financial position. Thus:

H3a: There is a positive association between profitability and dividend policy in the post-2003 period in Turkey.

Contrarily, a firm's funds requirements for growth (investment) opportunities appear to have a negative impact on dividend payouts (Rozeff, 1982; Baker and Wurgler, 2004; Aivazian et al., 2006). Similarly, a firm's debt policy is associated with dividend payments in

a negative way, since dividends and debt are considered as alternative mechanisms to control agency costs (Jensen, 1986; Crutchley and Hansen, 1989; Al-Najjar, 2009). Given that the CMB of Turkey has shown a serious effort to prevent credit risk concentration and insider lending within the same business group companies, the ISE firms find external financing a way more costly, rather than obtaining much of their funds required from their own business group banks, in the post-2003 period. Hence, we propose that ISE firms are more likely to use their internally generated earnings to fund their investments, instead of distributing them as a cash dividend. By emphasising the transaction costs involved with external financing and the substitution role of debt for dividends in controlling agency problems, we also predict that ISE firms with more debt are less likely to pay dividends. Therefore, we formulate the following hypotheses:

H3b: There is a negative association between investment opportunities and dividend policy in the post-2003 period in Turkey.

H3c: There is a negative association between debt policy and dividend policy in the post-2003 period in Turkey.

Moreover, firm age and firm size are other two important factors that appear to be positively influencing dividend policy in the literature. Since firms get older in terms of age, in other words mature firms, they tend to have steady earnings and hence are able to preserve a good level of funds. This allows them to pay higher dividends (Grullon et al., 2002). Likewise, it is documented that large firms are generally mature organisations and have easier access to capital markets at lower costs but they usually face higher potential agency problems as they expand, compared to smaller firms. Accordingly, this results in a positive relationship between firm size and dividends (Moh'd et al., 1995; Fama and French, 2001; Ferris et al., 2006). Based on the above discussion and given the new regulatory reforms in preventing insider lending, we dispute that more mature and larger sized ISE firms are more likely to sustain stable funds and have easier access to capital markets (to raise costly external finance if needed), and so they are less dependent on retained earnings and hence they can manage to pay higher dividends. Therefore:

H3d: There is a positive association between firm age and dividend policy in the post-2003 period in Turkey.

H3e: There is a positive association between firs size and dividend policy in the post-2003 period in Turkey.

4. Data and Methodology

4.1 Data

We obtain the data for this study from several different sources. Information on accounting and financial variables is derived from DATASTREAM, whereas the data on firms' ownership and incorporation dates are compiled from the annual reports published in the Public Disclosure Platform (KAP) of the ISE and firms' official websites. The validity of the data is also cross checked with OSIRIS database. We, then, construct our sample as follows. First, we consider all publicly listed firms on the ISE over the period 2003-2012. Second, we narrow the sample down to firms whose data are available on DATASTREAM. Third, we exclude financial (Industry Classification Benchmark (ICB) code 8000) and utility (ICB code 7000) sector companies. These criteria provide us an unbalanced panel of 2,112 firm-year observations representing 264 unique ISE firms from 14 different industries (based on ICB codes) over the period 2003-2012.

4.2 Research design, models and variable construction

In order to test our hypotheses related to the target payout ratio and dividend smoothing (i.e., *H1, H2a, H2b, H2c, and H2d)*, we first employ a modified specification of Lintner's (1956) partial adjustment model. In particular, (i) following Fama and Babiak (1968) – as many other researchers, such as Adaoglu (2000), Aivazian et al. (2003a), Al-Najjar (2009), Al-Ajmi and Abo Hussain (2011), and Al-Malkawi et al. (2014), we use firm-level data (in other words, per share data) instead of aggregate data used by Lintner. This is because dividend policy decisions are made by each individual firm and hence firm-level data are more appropriate for examining firm-specific choices, which might not be properly captured by using aggregate data that may simply reflect the common growth trends. (ii) We include a dummy variable in the model to identify whether there is a significant impact of different payout regulations on dividends, since the ISE firms were subject to two significantly different dividend payment regulations between the sub-periods 2003-2008 and 2009-2012 over the entire research period. (iii) We also introduce the interaction terms between the period dummy and the explanatory variables. (iv) Finally, we attempt to control for the industry-effect by adding industry dummies into the model. Accordingly, we construct the following equation:

$$DPS_{i,t} = \alpha_i + \beta_1 EPS_{i,t} + \beta_2 DPS_{i,t-1} + \beta_3 PERIOD_{i,t} + \beta_4 (PERIOD_{i,t} \times EPS_{i,t}) + \beta_5 (PERIOD_{i,t} \times DPS_{i,t-1}) + \sum_{j=1}^{n} \beta_j INDUSTRY_{j,i,t} + u_{i,t}, \quad (1)$$

where $DPS_{i,t}$ is the current dividends per share and $EPS_{i,t}$ is the current year earnings per share for firm *i* at year *t;* $DPS_{i,t-1}$ is the lagged dividends per share for firm *i* that distributed in year *t*-1 (previous year); $PERIOD_{i,t}$ is a dummy taking a value of 0 for the sub-period 2003-2008 and 1 for the sub-period 2009-2012; $(PERIOD_{i,t} \times EPS_{i,t})$ and $(PERIOD_{i,t} \times DPS_{i,t-1})$ are the interaction terms between period dummy and earnings per share, and period dummy and lagged dividends per share, respectively; $INDUSTRY_{j,i,t}$ is a vector of dummy variables representing 14 different industries (based on ICB codes).

Furthermore, in testing our hypotheses based on the link between five fundamental financial characteristics and dividend policy (i.e., *H3a, H3b, H3c, H3d* and *H3e*), we attempt to formulate a model, which helps determine the effects of these financial factors on the probability of paying a cash dividend. More specifically, (i) we estimate a logit model – because when firms make their dividend policy decisions, they face two options; to pay or not to pay dividends, and hence a logit regression model is an appropriate econometric technique for estimating the binary dependent variable (0/1). (ii) Again, we add a period dummy proxing for the two sub-periods of different dividend payment regulations, and the interactions terms between the period dummy and the five financial characteristics variables, into the model. (iii) As well, we include industry dummies for controlling the industry-effect. (iv) Finally, we also consider the issue of endogeneity and use one-year lagged values for all independent variables in the model, ensuring that the five financial characteristics are predetermined with respect to the dividend payment decision, to alleviate endogeneity concerns. Accordingly, we estimate a logit model by the following equation:

$$DPAY_{i,t} = \beta_0 + \beta_1 ROA_{i,t-1} + \beta_2 INVEST_{i,t-1} + \beta_3 DEBT_{i,t-1} + \beta_4 AGE_{i,t-1} + \beta_5 SIZE_{i,t-1} + \beta_6 PERIOD_{i,t} + \beta_7(PERIOD_{i,t} \times ROA_{i,t-1}) + \beta_8(PERIOD_{i,t} \times INVEST_{i,t-1}) + \beta_9(PERIOD_{i,t} \times DEBT_{i,t-1}) + \beta_{10}(PERIOD_{i,t} \times AGE_{i,t-1}) + \beta_{11}(PERIOD_{i,t} \times SIZE_{i,t-1}) + \sum_{j=1}^{n} \beta_j INDUSTRY_{j,i,t} + u_{i,t-1}, \quad (2)$$

$$DPAY_{i,t} = \begin{cases} 0 \text{ if } DPay_{i,t} = 0, \\ 1 \text{ if } DPay_{i.t} > 0, \end{cases}$$

where $DPAY_{i,t}$ is the probability of paying dividends (dependent variable), which is a binary code (0/1) that equals to 1 if the firm pays a dividend and 0 otherwise in a given year over the period 2003-2012; *ROA* is the return on assets ratio (profitability) measured as net earnings to total assets; *INVEST* is the market-to-book ratio (investment opportunities);

DEBT is the debt ratio measured as total debt divided by total assets; *AGE* is the firm age calculated as the natural logarithm of the total number of years since the firm's incorporation date; *SIZE* is the firms size measured as the natural logarithm of the market capitalisation; *PERIOD* is a dummy taking a value of 0 for the sub-period 2003-2008 and 1 for the sub-period 2009-2012; *(PERIOD x ROA), (PERIOD x INVEST), (PERIOD x DEBT), (PERIOD x AGE) and (PERIOD x SIZE)* are the individual interaction terms between period dummy and each of the five explanatory variables, respectively; *INDUSTRY* is a vector of industry dummy variables.[2]

5. Empirical results and discussion

5.1 Univariate analysis

Due to the significant regulatory changes on dividend policy during our research period, we provide univariate analysis by comparing various financial factors, ownership structures and cash dividend characteristics of the sampled firms for two sub-periods, 2003-2008 and 2009-2012. We use a number of Levene's tests for equality of variance, standard t-tests for equality of mean (without assuming equality of variance) and the non-parametric Wilcoxon rank-sum tests, to find whether the two sub-periods are similar or considerably different on each factor.

(Insert Table 1 here)

Panel A in Table 1 displays the results of univariate tests of ten financial characteristics for the two sample sub-periods. We find that total sales, total assets, market capitalisation, net earnings and total debt are, on average, 670 million TL (Turkish Lira), 619 million TL, 485 million TL, 39 million TL and 130 million TL, respectively for the sub-period 2003-2008, and 986 million TL, 1,026 million TL, 866 million TL, 56 million TL and 278 million TL respectively for the sub-period 2009-2012. All these differences are statistically significant and indicate a considerable amount of increase on each of the five characteristics from 2003-2008 to 2009-2012. The results for return on assets, market-to-book ratio, debt ratio, firm age and firm size are also found to be statistically significant. More specifically, market-to-book and debt ratios and firm age and size (in natural logarithm) show higher levels, whereas return on assets dramatically decreases over the sub-period 2009-2012, compared to the sub-period 2003-2008. Hence, univariate tests reveal that there are significant differences in financial characteristics of ISE firms between the two time-periods.

[2] Although not separately reported here, using Pearson's correlation and Variance Inflation Factors (VIF), we detect that there is no multicollinearity problem exist between our independent variables. The results are available from authors upon request.

Panel B of Table 1 presents the analyses of differences for ownership structures between two sub-periods. We categorise shareholdings into six types; ownerships of family, foreign, domestic institutions, the state and minority investors (ownership dispersion) and miscellaneous. We also look at firms' board size and the number of controlling family members on the board. The results show that ISE firms have highly concentrated and centralised ownership structures. Families, on average, own around 39% of total equity in the sub-period 2003-2008, and about 40% during the sub-period 2009-2012. Foreign investors are the second largest blockholders, holding approximately 12-13% of total shares in both sub-periods. Minority investors have, on average, about 35% of total equity in the first sub-period, whereas their fraction is just a bit over 36% in the second one. However, none of these differences between the two sub-periods are statistically significant. Other blockholders show relatively lower shareholdings on average; domestic financial institutions' ownership is around 4% in both sub-periods, and the state owns just about 2% of total shares during 2003-2008 and 1% during 2009-2012, which is the only statistically significant difference between two sub-periods. Moreover, the board size and controlling family members on the board in the last two rows of the Panel B illustrate that at least one family member takes a place on the board, which are generally sized on 6-7 executives, similarly in both time periods.

Panel C in Table 1 reports the results of univariate analyses performed for the sample's cash dividend payment characteristics between the sub-period 2003-2008, when the CMB imposed mandatory dividend payout ratios, and the period 2009-2012, when the CMB abolished mandatory minimum dividend payment requirement. We find that among those ISE-listed firms in our sample, almost 34% of them paid cash dividends in both sub-periods, indicating no significant difference in the percentage numbers of cash dividend payers over time. Likewise, the average dividends paid per share (0.169 TL during 2003-2008 and 0.172 TL during 2009-2012) and dividend payout ratio (25.5% during 2003-2008 and 23% during 2009-2012) show very similar levels in both time periods. Contrarily, we observe that there is evidence of significant differences in the magnitude of cash dividends distributed and in the percentage of dividend yield. Particularly, in the second sub-period after the abolishment of the mandatory dividend policy starting with the fiscal year 2009, ISE firms, on average, significantly increased their cash dividend payments from 16 million TL to 26 million TL; however, their average dividend yield ratio significantly dropped from 2.1% to 1.6% during this sub-period.

5.2 Analysis of a modified specification of Lintner model

We apply our modified specification of Lintner's (1956) partial adjustment model on the Turkish panel dataset, using the pooled Ordinary Least Squares (OLS) regressions. We compute two estimates for this model (Model 1); the first one consists of estimates based on all firms in the sample (1,846 observations) and the second one contains estimates from only dividend-paying firms (1,121 observations). Also, we use White's corrected heteroscedasticity robust regressions. Panel A in Table 2 shows the results of estimates from the pooled OLS regressions.

(Insert Table 2 here)

The results indicate that the overall pooled OLS models estimating the modified Lintner equation (Model 1) are statistically significant at the 1% level for both samples of all firms and dividend-payers (that is where we exclude all zero dividend-paying firms), as reported by F-statistics. The R-squared values of 46.13 for all firms and 45.91 for dividend-payers show a decent level of goodness of fit, suggesting that about 46% of the variation in the firm-level cash dividend payments, in both samples, are explained by the model.

With regard to our main explanatory variables of interest, the coefficients on current EPS ($t = 3.22$, $p < 0.01$ for all firms and $t = 4.30$, $p < 0.01$ for dividend-payers) and lagged DPS ($t = 6.74$, $p < 0.01$ for all firms and $t = 9.78$, $p < 0.01$ for dividend-payers) are both highly significant and positive. This shows that the two variables of the basic Lintner model works well in explaining cash dividends of the ISE firms over the period 2003-2012, after Turkey implemented major economic and structural reforms in 2003 as well as adopting more flexible mandatory dividend policy regulations and attempting to prevent insider lending. Consistent with many previous studies conducted in various emerging markets (e.g., Mookerjee, 1992; Pandey, 2001; Al-Najjar, 2009; Al-Ajmi and Abo Hussain, 2011; Al-Malkawi et al., 2014), this evidence suggests that current year's dividends per share is the function of the level of current earnings per share and the pattern of dividend per share in the previous year in the post-2003 period in Turkey. This is, however, inconsistent with the findings of earlier studies of Adaoglu (2000) and Aivazian et al. (2003a), which report no support to the validity of the Lintner model in the Turkish market, possibly due to the presence of rigid mandatory dividend payout rules imposed to the ISE firms during the earlier periods.

Moreover, we add a dummy variable (PERIOD) that takes a value of 0 for the second mandatory dividend policy time interval (2003-2008) and 1 for the period when there was no compulsory dividend payout requirement (2009-2012). Because, we attempt to identify whether there is an impact of considerably different policy regulations on dividends over our entire research period. We also create two interaction term variables to provide further insights on the interaction effects of sub-periods and earnings per share (PERIOD x EPS), and that of sub-periods and lagged dividends per share (PERIOD x DPS_{t-1}) on current dividends per share. As Panel A in Table 2 illustrates, PERIOD coefficients are negative and significant ($t = -1.77$, $p < 0.10$ for all firms and $t = -1.69$, $p < 0.10$ for dividend-payers). The estimated coefficients on PERIOD x EPS are negative and significant ($t = -1.90$, $p < 0.10$ for all firms and $t = -1.86$, $p < 0.10$ for dividend-payers), whereas PERIOD x DPS_{t-1} show a positive and highly significant interaction effect ($t = 6.08$, $p < 0.01$ for all firms and $t = 5.52$, $p < 0.01$ for dividend-payers).

At first glance, the negative impact of sub-periods dummy suggests that there is a tendency to decrease dividends in the second sub-period 2009-2012, when firms are not subject to imposed policy regulations, compared to the first sub-period 2003-208. In addition to the positive relationship between past and current year's dividends per share, the interaction of sub-period dummy and lagged dividends per share also has a positive effect on current dividends per share. This implies that ISE firms tend to make stabilized dividends although mandatory dividend regulations are abolished. However, current year's earnings per share through the interaction with period dummy has an inverse impact on current dividends. This may indicate either that ISE firms are more likely to avoid immediate response to earnings increases or losses; instead they attempt to balance stable dividends and prevent spectacular changes in the short-run, or that ISE firms are less willing to pay cash dividends in the second sub-period. Therefore, we need to rearrange our research model of the modified Lintner specification (Equation (1)) to understand how to interpret these coefficients and to identify their effects on dividend policy and stability.

So we recall Equation (1):

$$DPS_{i,t} = \alpha_i + \beta_1 EPS_{i,t} + \beta_2 DPS_{i,t-1} + \beta_3 PERIOD_{i,t} + \beta_4 (PERIOD_{i,t} \times EPS_{i,t}) + \beta_5 (PERIOD_{i,t} \times DPS_{i,t-1}) + \sum_{j=1}^{n} \beta_j INDUSTRY_{j,i,t} + u_{i,t} \quad (1)$$

Let *PERIOD* = 0, which reflects the sub-period 2003-2008:

$$DPS_{i,t} = \alpha_i + \beta_1 EPS_{i,t} + \beta_2 DPS_{i,t-1} + \beta_3 \times 0 + \beta_4 (PERIOD_{i,t} \times 0) + \beta_5 (PERIOD_{i,t} \times 0) + \sum_{j=1}^{n} \beta_j INDUSTRY_{j,i,t} + u_{i,t} \quad (1a)$$

$$DPS_{i,t} = \alpha_i + \beta_1 EPS_{i,t} + \beta_2 DPS_{i,t-1} + \sum_{j=1}^{n} \beta_j INDUSTRY_{j,i,t} + u_{i,t}, \quad (1b)$$

where $\beta_1 = c_i.r_i$ and $\beta_2 = 1 - c_i$. The parameter c_i represents the speed of adjustment coefficient (hereafter SOA), whereas r_i stands for the target payout ratio (hereafter TPR). The SOA $(c_i = 1 - \beta_2)$ illustrates the stability in dividend changes by calculating the adjustment speed to the TPR $(r_i = \beta_1 / 1 - \beta_2)$ in response to changes in earnings. Thus, it reveals firm *i*'s behaviour of dividend smoothing to variations in the earnings levels over the sub-period 2003-2008.

Now, if we let *PERIOD* = 1, which reflects the sub-period 2009-2012, in Equation (1):

$$DPS_{i,t} = \alpha_i + \beta_1 EPS_{i,t} + \beta_2 DPS_{i,t-1} + \beta_3 \times 1 + \beta_4 (1 \times EPS_{i,t}) + \beta_5 (1 \times DPS_{i,t-1}) + \sum_{j=1}^{n} \beta_j INDUSTRY_{j,i,t} + u_{i,t} \quad (1c)$$

$$DPS_{i,t} = (\alpha_i + \beta_3) + (\beta_1 + \beta_4) EPS_{i,t} + (\beta_2 + \beta_5) DPS_{i,t-1} + \sum_{j=1}^{n} \beta_j INDUSTRY_{j,i,t} + u_{i,t} \quad (1d)$$

Accordingly, the calculation of Lintner's parameters changes when *PERIOD* = 1, as we must consider the interaction terms coefficients to capture the effects of earnings per share and lagged dividends per share through the interaction with the period dummy on dividends per share and dividend stability. Then, the SOA can be calculated by $[c_i = 1 - (\beta_2 + \beta_5)]$ and the TPR can be obtained by $[r_i = (\beta_1 + \beta_4) / 1 - (\beta_2 + \beta_5)]$ from Equation (1d) for the sub-period 2009-2012.

As suggested by Lintner (1956), the SOA parameter shows how reactive dividends are to earnings changes, and lies between 0 and 1 ($0 < c \leq 1$). A high SOA indicates a speedy adjustment towards the target; for instance, the SOA of 1 (at its maximum level) implies that the firm does not adjust or smooth cash dividends, instead it relies on the long-run TPR. A reverse argument is valid for low SOAs that indicate slower adjustments; for example, a value of SOA closed to zero means that the firm smooths dividend payments and slowly adjusts to the TPR. In this respect, Panel A in Table 2 reports our SOA and TPR estimates based on the pooled OLS regressions. Using the formulas explained above, we find that the SOA is 0.580 ($c_1 = 1 - 0.420$) and TPR is 23.3% ($r_1 = 0.135 / 1 - 0.420$) for all firms, whereas these parameters are 0.593 ($c_1 = 1 - 0.407$) and 25.5% ($r_1 = 0.151 / 1 - 0.407$), respectively, for dividend-payers over the sub-period 2003-2008. We further detect

that the SOA is 0.521 [$c_2 = 1 - (0.420 + 0.059)$] and TPR is 21.3% [$r_2 = {(0.135 - 0.024)}/{1 - (0.420 + 0.059)}$] for all firms, whereas they are 0.529 [$c_2 = 1 - (0.407 + 0.064)$] and 22.5% [$r_2 = {(0.151 - 0.032)}/{1 - (0.407 + 0.064)}$] for dividend-payers during the sub-period 2009-2012.

(Insert Table 3 here)

Table 3 displays a summary of estimates on the SOA and TPR parameters from our study and various empirical research conducted in different time periods and markets. For instance, Adaoglu (2000) finds a SOA factor of 1 and Aivazian et al. (2003a), similarly, report a very high SOA of 0.92 (0.88 if zero dividend-paying observations were excluded) for their Turkish samples. They conclude that ISE firms did not smooth their dividends and followed unstable dividend policies that were determined by the level of current earnings in earlier periods when the CMB imposed the minimum 50% of profit distribution as a cash dividend. In fact, Adaoglu and Aivazian et al. detect that the TPRs of listed firms were around 52% and 49% (52% based on only dividend-paying observations), respectively, which were closely commensurate with the mandatory dividend payment requirement. Our results, however, show much lower SOAs (around 0.58 for all firms and 0.59 for dividend-payers) between 2003 and 2008, compared to these studies, indicating a moderate level of dividend smoothing adopted by ISE firms in the sub-period when the CMB introduced the second mandatory dividend policy, which was more flexible than the first one but still required a minimum payout that ranged between 20% to 30%. Besides, our estimates of TPRs for this sub-period (about 23.3% for all firms and 25.5% for dividend-payers) are consistent with the second mandatory payout requirement, and suggest that ISE-listed firms do have their target payout ratios and adjust their cash dividends by moving gradually to their target at a moderate level of speed of adjustment. Furthermore, our SOA and TPR estimates for the sub-period 2009-2012 (approximately 0.52 and 21.3% for all firms, and 0.53 and 22.5% for dividend-payers, respectively) point out that after the abolishment of mandatory dividend payment requirement starting with the fiscal year 2009, ISE firms very slightly reduce their target payouts but still moderately smooth their dividends (even a little smoother).

Compared to the other emerging markets, our SOAs are lower than that found by Mookerjee (1992) for India (c = 0.73), Chemmanur et al. (2010) for Hong Kong (c = 0.68), and Al-Ajmi and Abo Hussain (2011) for Saudi Arabia (c = 0.71) but slightly higher than that documented by Al-Najjar from Jordan (c = 0.43). However, our results generally report higher SOA estimates in comparison to the SOA values obtained by previous studies in the developed US market – that is, 0.30 reported by Lintner (1956), 0.45 obtained by Fama and Babiak (1968), and 0.28 detected by Chemmanur et al. (2010). Overall, we conclude that

dividend policy now plays an important role in signalling in Turkey; particularly, the ISE firms adjust their cash dividend payments towards their target payout ratios by a moderate level of dividend smoothing and tend to follow reasonably stable dividend policies in the post-2003 period. Therefore, this provides support for *H1.*

We further perform additional tests to check how robust our main results are. Although it is suggested that the partial adjustment model can be consistently estimated by the OLS[3] (Gujarati, 2003), Blundell and Bond (1998) develop a more advanced model, called the system Generalised Method of Moments (GMM), to deal with the potential endogeneity problem of a dynamic panel model where a lagged dependent variable is included into the equation as an explanatory variable. Hence, we use the system GMM regressions to estimate our research model (Model 1) to identify whether our results are sensitive to the usage of chosen econometric specification. Panel B in Table 2 illustrates the system GMM estimate results, which are very similar to the results of the pooled OLS estimates that are reported in Panel A in the same table. Thus, this confirms more robust and reliable results from both specifications.

Additionally, we extend our research specification by adding further explanatory variables that are observed in the literature. Particularly, we first modify the equation by including the lagged earnings per share (following Fama and Babiak (1968)) in Model 2, and by including the current and lagged debt ratio (following Mookerjee (1992)) in Model 3. Table 4 shows the estimates of the pooled OLS in Panel A and the system GMM estimates in Panel B for both extended specifications. The results indicate that ISE firms have their target payout ratios and adjust their dividends towards their target by a moderate level of smoothing in the post-2003 period, consistent with what we previously report and also confirming robustness of our main findings.

(Insert Table 4 here)

5.3 Analysis of ownership structure effect on Lintner model specification

In order to ascertain how ownership structure affects the target payout ratio and dividend smoothing of ISE-listed firms, we apply our modified Lintner specification (Model 1) on several subsamples that are constructed according to the type and existence of large shareholders. Therefore, we stratify our sample into four categories; Subsample A is

[3] Indeed, we also employ two types of panel models, namely fixed effects and random effects least squares. However, preliminary tests show that the pooled OLS models are more appropriate than the panel models in the context of our analyses. Therefore, we only report the results from the pooled OLS models.

comprised of firms under family control with large family ownership concentration. Subsample B consists of firms that are characterised by high prevalence of non-family blockholders (e.g., foreign and domestic institutional investors and the state) only. Firms in Subsample C are dominated by large controlling families and other non-family blockholders. Subsample D contains widely-held firms that have dispersed ownership structure with single ownership below %5. Accordingly, Table 5 shows the results of pooled OLS estimates for our four stratified subsamples based on observations both from all firms and dividend-paying firms.

(Insert Table 5 here)

The results reveal that F-statistics of each of the eight pooled OLS regressions (four subsamples based on two estimates) are statistically significant at the 1% level, indicating overall significance of all models. The R-squared values of estimated equations vary between 44% to 63% and thus suggest an acceptable level of goodness of fit. Furthermore, we observe that our main variables, current EPS and lagged DPS, and the dummy variable for sub-periods (PERIOD) with the interaction terms (PERIOD x EPS and PERIOD x DPS_{t-1}) are statistically significant, although at different conventional significance levels, and have the same directional impacts as explained in the previous sub-section, in all regressions. However, the coefficients of these variables comparatively differ among four subsamples and hence indicate that the target payout ratios and dividend smoothing behaviour of firms in four categories are significantly different from each other. As hypothesised, this reflects the impact of ownership structure on dividend stability explanation proposed by Lintner (1956).

In this respect, our first important finding is that Subsample A has the highest target payout ratios (the TPRs of 29.7% and 27.4% for all firms, and 32.3% and 29.6% for dividend-payers in the first and second sub-period, respectively) and, more interestingly, the lowest adjustment factors (the SOAs of 0.249 and 0.218 for all firms, and 0.251 and 0.223 for dividend-payers in the first and second sub-period, respectively). Al-Najjar and Kilincarslan (2016) suggest that although family ownership is negatively associated with dividend payout, families do not seem to expropriate through cash dividends in Turkey since all other types of shareholders (even minority investors) also have significantly negative effects on the amount of dividend payouts. Our finding, however, reveals that the ISE firms with family ownership concentration and control aim high cash dividend distribution and display the stickiest dividend behaviour (in other words, the most stable dividend policies). This is also inconsistent with the expropriation argument and instead shows that when Turkish families pay cash dividends, they tend to use dividends as a reputation for good treatment of shareholders and to reflect their firms' good financial performance. Contrarily, Subsample B has comparatively lower payouts (the TPRs of 16.4% and 13.6% for all firms,

and 17.8% and 14.5% for dividend-payers in the first and second sub-period, respectively) and the highest speed of adjustment factors (the SOAs of 0.953 and 0.936 for all firms, and 0.949 and 0.926 for dividend-payers in the first and second sub-period, respectively). Since Subsample B includes the ISE firms that are characterised by only non-family blockholders, this indicates that when foreign and/or domestic institutional investors and/or state hold large shareholdings alone, they appear to significantly decrease the target payout ratios and abolish dividend smoothing. Hence, our evidence reveals that non-family blockholders do not use cash dividends neither as a monitoring mechanism. Consistent with Al-Najjar and Kilincarslan (2016), nor as a signalling device, perhaps due to their efficient monitoring and information gathering abilities.

Moreover, Subsample C has the second highest target payout ratios (the TPRs of 25% and 22.9% for all firms, and 27.7% and 23.5% for dividend-payers in the first and second sub-period, respectively) and it has relatively moderate levels of speed of adjustments (the SOAs of 0.464 and 0.402 for all firms, and 0.470 and 0.404 for dividend-payers in the first and second sub-period, respectively). This finding shows that the ISE firms that are dominated my families and other types of large shareholders also aim to pay high cash dividends but, differently from the firms under family control only, the existence of non-family blockholders decreases the degree of dividend smoothing. As predicted, families still attempt to use dividends as a reputation device for fair treatment of minority investors when their firms are highly concentrated with the presence of non-family blockholders, although less stable compared to firms in Subsample A. Finally, the ISE firms with dispersed ownership structures in Subsample D follow stable dividend policies by a serious degree of smoothing (the SOAs of 0.362 and 0.311 for all firms, and 0.360 and 0.302 for dividend-payers in the first and second sub-period, respectively). However, they have the lowest payout ratios (the TPRs of 9.9% and 9% for all firms, and 11.1% and 10.3% for dividend-payers in the first and second sub-period, respectively). This evidence is contrary to our prediction that minority shareholders have a taste for higher dividends to increase dividend-induced capital market monitoring and reduce what is left for expropriation, as well as inconsistent with a number of studies, such as Rozeff (1982), Moh'd et al. (1995), La Porta et al. (2000) and Farinha (2003). Instead, this may imply that small shareholders in Turkey have a preference for capital gains over cash dividends. Consequently, above discussion provides support for *H2a, H2b* and *H2c,* but leads us to reject *H2d.*

Again, we conduct further tests by employing the system GMM regressions for each of the eight model specifications of our subsamples, in order to check whether our findings are robust or sensitive to the usage of a different econometric technique. As illustrated in

Table 6, our system GMM estimates are consistent with our pooled OLS estimates and provide very similar TPRs and SOAs that reported in Table 5.

(Insert Table 6 here)

5.4 Analysis of financial characteristics effect on dividend payment decisions

In this sub-section, we compute our logit model (Equation (2)) to identify how financial characteristics of ISE firms influence their dividend payment decisions, by applying pooled logit and random effects (panel) logit regression estimates. We also calculate the marginal effects (economic significance) of the independent variables to provide further interpretations in addition to the coefficient estimates (statistical significance). Table 7 reports the results of the pooled and random effects logit estimations on the probability of firms to pay dividends in the Turkish market.

(Insert Table 7 here)

The results show that when our logit model is estimated by the pooled logit regression, it is overall statistically significant at the 1% level, as evidenced by the Wald X^2 test. The Pseudo R^2 value of 35.48% suggests a good indication as to the prediction power of the model. Similarly, the random effects (panel) regression also estimates that the model is overall statistically significant at the 1% level, as reported by the Wald X^2 test. In this case, the likelihood-ratio test is highly significant at the 1% level, which indicates that the proportion of the total variance, contributed by the panel-level variance component (*rho* value) is significantly different from zero (0.6123). This suggests that random effects logit regression is more suitable than pooled logit regression in estimating the relationship between financial variables and dividend payment decisions in the ISE. This is also consistent with Gujarati (2003) which states that a random effect logit model, which uses both within and between (group) possible variations, is more favourable than a pooled logit model (ignoring the firm effects) in its estimating power, since it allows the derivation of more efficient estimators. Hence, we report our findings based on the random effects logit estimates, although both types of regressions provide similar results.

The random effects logit estimates in Table 7 reveal that there is a strong positive correlation between profitability (ROA) and the probability of an ISE firm to distribute a cash dividend. The coefficient on ROA ($z = 5.99$, $p < 0.01$) is positive and highly significant, and the marginal effect of this variable shows, other things being equal, that a 10 percentage point increase in ROA will increase the probability of paying dividends by approximately 11.37%. This suggests that more profitable ISE firms are more likely to pay cash dividends to signal their better financial performance, in line with previous research (e.g., Fama and

French, 2001; Aivazian et al., 2003b; Ferris et al., 2006). However, there is evidence that investment opportunities have a negative effect on dividend payment decisions of the ISE firms, since the coefficient on INVEST is negative and statistically significant ($z = -3.02$, $p < 0.01$). The marginal effect of INVEST indicates that a 10 percentage point increase in investment opportunities will decrease the likelihood of paying a cash dividend by about 1.5% for an average firm. This means that ISE firms with more investment opportunities need more funds, therefore they are more likely to preserve earnings for investments rather than paying dividends, consistent with studies such as Rozeff (1982), Baker and Wurgler (2004) and Aivazian et al. (2006).

The results reveal another negative association, which is between firm debt level and dividend payment decisions. The coefficient on DEBT is negative and statistically significant ($z = -2.63$. $p < 0.01$) and the marginal effect of this variable shows that the probability of paying a cash dividend drops by around 2.78%, corresponding to a 10 percentage increase in debt level. This finding is in line with the notion that debt and dividends are alternative mechanisms in controlling agency problems and supports the argument that higher debt levels lead to higher risk and transaction cost involved with external financing (Jensen, 1986; Crutchley and Hansen, 1989; Al-Najjar, 2009). Thus, ISE firms attempt to maintain their earnings to lower costly external financing, which results in distributing non or lower dividends. Moreover, the results report that corporate dividend payment decisions of ISE firms are positively affected by firm age (AGE) and size (SIZE). The coefficients on AGE ($z = 2.24$, $p < 0.05$) and SIZE ($z = 7.31$, $p < 0.01$) are both positive and statistically significant. The marginal effects of AGE and SIZE confirm these positive associations and indicate that a 10 percentage point increase in AGE and SIZE will approximately result in a 0.65% and 1.02% increase in the probability of paying a cash dividend, respectively. This evidence implies that more mature and larger sized ISE firms are more likely to pay cash dividends, consistent with Grullon et al. (2002), Moh'd et al. (1995), Fama and French (2001) and Ferris et al. (2006). This is possibly because they can sustain stable funds and have easier access to capital markets, thereby less dependent on retained earnings, which enable them to pay higher dividends.

We further detect that the random effects estimates show no significant impact of the sub-period dummies (PERIOD) on the likelihood of paying dividends. Similarly, none of the interaction terms between period dummy and each of the five financial factors (PERIOD x ROA, PERIOD x INVEST, PERIOD x DEBT, PERIOD x AGE and PERIOD x SIZE) is statistically significant. This suggests that although the research period has witnessed significantly different dividend policy regulations imposed by the CMB (i.e., the sub-periods 2003-2008 and 2009-2012), these fundamental financial characteristics have the same

influence on dividend policy over the entire period. Accordingly, we conclude that more profitable, more mature and larger sized ISE firms are more likely to pay dividends, whereas ISE firms with higher investment opportunities and more debt are less likely to pay dividends in the post-2003 period in Turkey. Hence, this provides supports for *H3a, H3b, H3c, H3d* and *H3e.*[4]

6. Conclusion

Using a sample of ISE-listed firms over the period 2003-2012, we examine the impact of regulations, reforms and legal environment on firm-level dividend policy, since this period witnessed various major economic and structural reforms implemented by the Turkish government and experienced significant changes in regulatory framework of cash dividend policy rules imposed by the CMB. Early studies conducted in Turkey showed that cash dividends were not used to signal favourable insider information nor were they used as a disciplinary device. The ISE firms concentrated on the first mandatory dividend payment requirement of distributing at least 50% of earnings as a cash dividend and thus did not much care about setting stable dividend policies. After the implementation of major reforms and the significant regulatory changes regarding dividend policy, our study, however, reveals that a number of important implications on cash dividend behaviour of the ISE firms in the post-2003 period.

We, first, find that current earnings per share and lagged dividends per share are positive and significant factors in determining current dividends per share of the ISE-listed firms. This provides empirical support for the validity of Lintner's (1956) partial adjustment model in the Turkish market over the period 2003-2012. In this respect, we further detect that the ISE firms have their target payout ratios and adjust their cash dividends, unlike earlier periods. More precisely, when the CMB of Turkey introduced the second mandatory policy, which was more flexible compared to the first one but still required a minimum payout that ranged between 20% to 30%, the ISE firms had their target payouts that were closely commensurate with this requirement and adjusted their dividends by moving gradually to their target at a moderate level of speed of adjustment between 2003 and 2008. After the abolishment of compulsory payout requirement starting with the fiscal year 2009, the ISE firms had the freedom to make their own dividend policy decisions and they tended to slightly reduce their target payouts but still moderately smooth their dividends (even a little

[4] We also perform tobit models instead of logit models, since we substitute the binary dependent variable (the probability of paying dividends – 0/1) for dividend payout ratio, whereas all the independent variables have the same previous definitions. Although not reported here, the tobit estimates provide very similar results, confirming the robustness of the logit estimates.

smoother) between 2009 and 2012. Accordingly, we conclude that the ISE firms follow reasonably stable dividend policies in the post-2003 period.

Moreover, our findings reveal that listed firms in the ISE have highly concentrated ownership structures, where the control is generally in the hands of families with the existence of other large shareholders, such as foreign and domestic financial investors and the state. In this setting, we find that ownership structure affects the target payout ratio and dividend smoothing in Turkey, probably because the concerns about cash dividends differ among the type and the existence of large shareholders. Indeed, it is observed that the ISE firms with family ownership concentration and control aim the highest target payout ratios and also display the stickiest cash dividend. This suggests that signalling is an important concern for Turkish families and they attempt to show their solid financial performance by stable cash dividend payments. Based on the "substitution model of dividends" proposed by La porta et al. (2000), this may also imply that Turkish families use cash dividends to establish a reputation of good treatment for minority shareholders of the firms under their control.

Furthermore, we find that the ISE firms with non-family blockholders (e.g., foreign and domestic financial investors and the state) significantly decrease the target payout ratios and abolish dividend smoothing. Similarly, the presence of non-family large shareholders reduces the degree of dividend smoothing of the ISE firms that are dominated by families and also have other types of blockholders. This evidence may imply that, consistent with the notion, argued by Grossman and Hart (1980), Demsetz and Lehn (1985) and Shleifer and Vishny (1986), large shareholders have better incentives and ability to act as an effective monitoring mechanism on the managements, which minimises the agency problems and consequently reducing, in general, the need for paying cash dividends. In addition, our findings show that although the ISE firms with dispersed ownership structures attempt to adjust their cash dividends by a serious degree of smoothing, they seem to have comparatively very low target payouts. This is contrary to the common belief that minority investors prefer higher dividends to increase dividend-induced capital market monitoring and reduce what is left for expropriation.

Finally, we also detect that financial characteristics of firms have significant effects on their dividend policy – in particular, more profitable, more mature and larger sized ISE firms are more likely to pay cash dividends, whereas the ISE firms with higher investment opportunities and more debt are less likely to involve with cash dividend distributions. These financial characteristics have the same influence on dividend decisions over the entire

period, although this period has witnessed significantly different dividend policy regulations imposed by the CMB in the two sub-periods of 2003-2008 and 2009-2012.

Overall, our results present strong evidence that regulations, reforms and legal environment have significant implications on the ISE-listed firms' dividend policy behaviour in the post-2003 period. Particularly, the ISE firms now follow stable dividends policies, although relatively less stable policies than developed markets, and the financial characteristics of these firms influence their dividend policy in a similar manner of a more developed countries. Hence, our study provides useful information for potential investors, policy makers and fellow researchers, about these changes in the Turkish market. The study also raises the need to assess how the market reacts to the changing dividend policy behaviour of the ISE firms. However, this is a promising question left for future research.

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Table 1. Univariate Results

	Sub-period 2003-2008 ***(n= 1,160)***	**Sub-period 2009-2012** ***(n= 952)***	**Mean difference**	**Levene's test**	**t-test**	**Wilcoxon test**
	Mean	Mean		*F-statistic*	*t-statistic*	*Z-statistic*
PANEL A: FINANCIAL CHARACTERISTICS						
Total sales *(million TL)*	669.62	985.72	−316.10	0.439***	−2.986***	−2.663***
Total assets *(million TL)*	618.70	1,025.99	−407.29	0.365***	−4.779***	−5.460***
Market capitalisation *(million TL)*	484.90	865.99	−381.09	0.413***	−4.313***	−6.913***
Net earnings *(million TL)*	39.47	56.14	−16.67	0.444***	−2.069**	−0.239
Total debt *(million TL)*	130.01	278.46	148.45	0.274***	−5.673***	−5.316***
Return on assets *(%)*	2.85	1.41	1.44	0.488***	1.768*	2.686***
Market-to-book ratio	1.381	1.662	−0.281	0.394***	−4.873***	−4.838***
Debt ratio	0.220	0.285	−0.065	0.221***	−2.719***	−3.569***
Firm age *(natural logarithm)*	3.421	3.475	−0.054	0.934	−2.469**	−3.639***
Firm size *(natural logarithm)*	4.625	5.153	−0.528	0.904	−7.130***	−6.913***

Notes: Total sales represent annual gross sales and other operating revenue. Total assets refer to the sum of total current assets, long term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment and other assets. Market capitalisation equals the share price (year-end) multiplied by the common shares outstanding. Net earnings represent annual income after all operating and non-operating income and expenses, reserves, income taxes, minority interest and extraordinary items. Total debt is the sum of long and short term debt. Return on assets is measured by net earnings to total assets. Market-to-book ratio is calculated as a firm's market value divided by its book value. Debt ratio is calculated as total debt divided by total assets. Firm age is the natural logarithm of firm's age in years. Firm size is the natural logarithm of market capitalisation of the firm. ***, ** and * stand for significance at the 1%, 5% and 10% levels, respectively.

PANEL B: OWNERSHIP STRUCTURE						
Family ownership *(%)*	38.59	40.31	−1.72	0.914	−1.320	−1.588
Foreign ownership *(%)*	13.04	12.39	0.65	1.018	0.556	0.913
Domestic institutional holdings*(%)*	4.28	3.81	0.47	1.013	0.666	1.609
State ownership *(%)*	1.97	1.06	0.91	2.076***	2.161**	1.730*
Miscellaneous *(%)*	2.66	1.98	0.68	1.450***	1.629	1.125
Ownership dispersion *(%)*	35.44	36.24	−0.80	0.837	−0.907	−0.252
Board size	6.59	6.66	−0.07	0.952	−0.754	−0.563
Family directors	1.50	1.62	−0.12	0.943	−1.624	−1.639

Notes: Family ownership represents the total percentage of outstanding shares held by family members, family managers and family-controlled holding companies. Foreign ownership is the sum of total shares owned by foreign corporations, foreign financial institutions and foreign nationals. Domestic institutional holdings refer to the total percentage of shares held by Turkish financial institutions. State ownership includes the central government and its wholly owned enterprises' shareholdings. Miscellaneous represents the share-ownership of organisations such as cooperatives, voting trusts and a company or a group with no single controlling investor. Ownership dispersion is measured as the total percentage of shares owned by a large number of small (minority) shareholders who held less than 5% of the outstanding shares of the firm. ***, ** and * stand for significance at the 1%, 5% and 10% levels, respectively.

PANEL C: CASH DIVIDEND CHARACTERISTICS						
Cash dividend-payers *(%)*	33.88	33.82	0.06	1.000	0.026	0.027
Cash dividends *(million TL)*	15.85	25.72	−9.87	0.477***	−1.980**	−0.339
Dividends per share *(TL)*	0.169	0.172	−0.003	2.761***	−0.094	−0.396
Dividend payout ratio† *(%)*	25.50	22.85	2.65	2.384***	0.659	0.643
Dividend yield *(%)*	2.09	1.57	0.68	1.982***	2.971***	0.971

Notes: Cash dividend-payers refer to the percentage number that is measured as cash dividend paying firms divided by total firms in the sample. Cash dividends equal to the total annual common and preferred dividends paid in cash to shareholders. Dividends per share represent the total dividends per share declared annually. Dividend payout ratio is calculated as the dividends per share divided by the earnings per share. Dividend yield is measured as the ratio of dividends per share to price per share. †Dividend payout ratio has 1,144 firm-year observations for the 2003-2008 period and 922 firm-year observations for the 2009-2012 period, due to the exclusion of negative payout ratio observations when firms make losses. ***, ** and * stand for significance at the 1%, 5% and 10% levels, respectively.

Table 2. Lintner Model Specification Results

Dependent variable: $DPS_{i,t}$

Model 1	**PANEL A:** Pooled OLS		**PANEL B:** System GMM	
Independent variables:	All firms	Dividend payers	All firms	Dividend payers
$EPS_{i,t}$	0.135*** (3.22)	0.151*** (4.30)	0.120*** (5.24)	0.133*** (3.57)
$DPS_{i,t-1}$	0.420*** (6.74)	0.407*** (9.78)	0.478*** (18.32)	0.453*** (16.53)
$PERIOD_{i,t}$	−0.021* (−1.77)	−0.019* (−1.69)	−0.034* (−1.93)	−0.028* (−1.73)
$PERIOD_{i,t}$ x $EPS_{i,t}$	−0.024* (−1.90)	−0.032* (−1.86)	−0.017*** (−2.96)	−0.021*** (−3.30)
$PERIOD_{i,t}$ x $DPS_{i,t-1}$	0.059*** (6.08)	0.064*** (5.52)	0.031*** (7.03)	0.042*** (6.48)
Constant	0.043 (0.89)	0.052 (1.03)	0.057 (1.36)	0.063 (1.58)
INDUSTRY	Yes	Yes	Yes	Yes
PERIOD = 0 (Between 2003 and 2008)				
Target payout ratio (r_1)	0.233	0.255	0.230	0.243
Speed of adjustment (c_1)	0.580	0.593	0.522	0.547

PERIOD = 1 (Between 2009 and 2012)				
Target payout ratio *(r_2)*	0.213	0.225	0.210	0.222
Speed of adjustment *(c_2)*	0.521	0.529	0.491	0.505
Number of observations	1,846	1,121	1,846	1,121
F-statistic	86.93***	56.36***	55.14***	39.62***
R-squared	46.13%	45.91%		
Arellano-Bond test for (AR1)			Pr > z = 0.00	Pr > z = 0.00
Arellano-Bond test for (AR2)			Pr > z = 0.92	Pr > z = 0.97
Hansen overidentifying test			Pr > chi^2 = 0.53	Pr > chi^2 = 0.65
Number of instruments			60	60

Notes: This table reports coefficients and t-statistics in the parenthesis. The pooled OLS models are tested using White's corrected heteroscedasticity robust regressions. The two-step, robust (Windmeijer's standard error correction), small (corrections that results in *t* instead of *z* statistic for the coefficients and *F* instead of *Wald* X^2 test for overall fit) and orthogonal (maximising sample size in panels with gaps) commands are used to make the system GMM estimates even more robust. ***, ** and * stand for significance at the 1%, 5% and 10% levels, respectively.

Table 3. Summary of Empirical Studies on Lintner's (1956) Parameters

Study	Market	Period	SOA	TPR
Lintner (1956)	USA	1918-1953	0.30	50%
Fama & Babiak (1968)	USA	1946-1964	0.45	33%
Mookerjee (1992)	India	1950-1981	0.73	85%
Dewenter & Warther (1998)	USA	1983-1992	0.06	–
	Japan	1983-1992	0.09	–
Adaoglu (2000)	Turkey	1985-1997	1.00	52%
Pandey (2001)†	Malaysia	1993-2000	0.20 to 0.63	12% to 76%
Aivazian et al. (2003a)††	Turkey	1983-1990		
	All firms		0.92	49%
	Dividend-payers		0.88	52%
Brav et al. (2005)	USA	1950-1964	0.66	35%
		1965-1983	0.35	24%
		1984-2002	0.22	11%
Al-Najjar (2009)	Jordan	1994-2003	0.43	48%
Chemmanur et al. (2010)	USA	1984-2002	0.28	–
	Hong Kong	1984-2002	0.68	–
Al-Ajmi & Abo Hussain (2011)	Saudi Arabia	1990-2006	0.71	43%

Al-Malkawi et al. (2014)	Oman	2001-2010	0.26	79%
Present Study	Turkey	2003-2008		
	All firms		0.58	23.3%
	Divided-payers		0.59	25.5%
	Turkey	2009-2012		
	All firms		0.52	21.3%
	Divided-payers		0.53	22.5%

Notes: SOA= Speed of adjustment, TPR = Target payout ratio. †The study uses the Lintner model to test the dividend stability of Malaysian firms in six different industrial sectors and reports the SOA and TPR values that vary considerably across the industrial sectors. ††The study investigates dividend polices of firms from eight different emerging markets and a control sample of US firms; however, we only report the results provided from the Turkish market.

Table 4. Results of Pooled OLS and System GMM Estimates for Variant Specifications of Lintner Model

Dependent variable: $DPS_{i,t}$

Model 2 & 3	**PANEL A:** Pooled OLS				**PANEL B:** System GMM			
	Model 2		Model 3		Model 2		Model 3	
Independent variables:	All firms	Dividend payers	All firms	Dividend payers	All firms	Dividend payers	All firms	Dividend payers
$EPS_{i,t}$	0.088*** (2.80)	0.079*** (2.62)	0.105** (2.16)	0.132** (2.55)	0.072*** (2.99)	0.065*** (2.74)	0.098*** (4.55)	0.121*** (5.34)
$EPS_{i,t-1}$	0.105*** (3.99)	0.120*** (4.67)			0.107*** (4.33)	0.139*** (5.44)		
$DPS_{i,t-1}$	0.371*** (4.82)	0.330*** (4.47)	0.512*** (3.82)	0.477*** (3.66)	0.365*** (7.15)	0.343*** (6.49)	0.537*** (6.55)	0.492*** (6.24)
$DEBT_{i,t}$			−0.156* (−1.74)	−0.243* (−1.86)			−0.196** (−2.19)	−0.280** (−2.31)
$DEBT_{i,t-1}$			−0.443** (−2.12)	−0.551** (−2.23)			−0.523*** (−3.03)	−0.612*** (−3.19)
$PERIOD_{i,t}$	−0.046* (−1.73)	−0.057* (−1.79)	−0.078* (−1.90)	−0.052* (−1.69)	−0.035** (−2.20)	−0.060** (−2.39)	−0.061** (−2.17)	−0.055** (−2.06)
$PERIOD_{i,t}$ x $EPS_{i,t}$	−0.017** (−2.40)	−0.013** (−2.38)	−0.020*** (−2.89)	−0.037*** (−3.77)	−0.011** (−2.45)	−0.009** (−2.30)	−0.018*** (−2.70)	−0.031*** (−3.28)
$PERIOD_{i,t}$ x $EPS_{i,t-1}$	−0.043*** (−2.62)	−0.059*** (−3.31)			−0.038*** (−3.02)	−0.041*** (−3.16)		
$PERIOD_{i,t}$ x $DPS_{i,t-1}$	0.087*** (3.86)	0.096*** (3.93)	0.055*** (6.43)	0.062*** (8.31)	0.069*** (5.30)	0.082*** (5.71)	0.042*** (6.82)	0.054*** (8.73)
$PERIOD_{i,t}$ x $DEBT_{i,t}$			−0.046* (−1.77)	−0.051* (−1.91)			−0.049** (−2.31)	−0.058** (−2.49)
$PERIOD_{i,t}$ x $DEBT_{i,t-1}$			−0.244** (−2.20)	−0.380** (−2.48)			−0.365*** (−2.63)	−0.495*** (−2.85)
Constant	0.028 (1.14)	0.042 (1.36)	0.037 (1.30)	0.051 (1.41)	0.030 (1.34)	0.049 (1.59)	0.044 (1.27)	0.057 (1.40)
INDUSTRY	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

PERIOD = 0 (Between 2003 and 2008)								
Target payout ratio (r_1)†	–	–	0.215	0.252	–	–	0.209	0.238
Speed of adjustment (c_1)	0.629	0.670	0.488	0.523	0.635	0.657	0.463	0.508
PERIOD = 1 (Between 2009 and 2012)								
Target payout ratio (r_2)†	–	–	0.196	0.206	–	–	0.190	0.198
Speed of adjustment (c_2)	0.542	0.574	0.433	0.461	0.566	0.575	0.421	0.454
Number of observations	1,846	1,121	1.846	1,121	1,846	1,121	1,846	1,121
F-statistic	78.89***	50.69***	66.62***	46.36***	54.94***	37.56***	46.60***	23.38***
R-squared	46.37%	45.96%	46.66%	46.16%				
Arellano-Bond test for (AR1)					Pr > z = 0.00	Pr > z = 0.00	Pr > z = 0.00	Pr > z = 0.00
Arellano-Bond test for (AR2)					Pr > z = 0.58	Pr > z = 0.61	Pr > z = 0.87	Pz > z = 0.93
Hansen overidentifying test					Pr > chi^2 = 0.73	Pz > chi^2 = 0.82	Pr > chi^2 = 0.96	Pr > chi^2 = 0.99
Number of instruments					61	61	121	121

Notes: This table reports coefficients and t-statistics in the parenthesis. The pooled OLS models are tested using White's corrected heteroscedasticity robust regressions. The two-step, robust (Windmeijer's standard error correction), small (corrections that results in *t* instead of *z* statistic for the coefficients and *F* instead of *Wald* X^2 test for overall fit) and orthogonal (maximising sample size in panels with gaps) commands are used to make the system GMM estimates even more robust. † Since the lagged earnings per share variable is added into the equation, the target payout ratios cannot be calculated for Model 2, as proposed by Lintner (1956). ***, ** and * stand for significance at the 1%, 5% and 10% levels, respectively.

Model 2: $$DPS_{i,t} = \alpha_i + \beta_1 EPS_{i,t} + \beta_2 EPS_{i,t-1} + \beta_3 DPS_{i,t-1} + \beta_4 PERIOD_{i,t} + \beta_5 (PERIOD_{i,t} \times EPS_{i,t}) + \beta_6 (PERIOD_{i,t} \times EPS_{i,t-1}) + \beta_7 (PERIOD_{i,t} \times DPS_{i,t-1}) + \sum_{j=1}^{n} \beta_j INDUSTRY_{j,i,t} + u_{i,t},$$

Model 3: $$DPS_{i,t} = \alpha_i + \beta_1 EPS_{i,t} + \beta_2 DPS_{i,t-1} + \beta_3 DEBT_{i,t} + \beta_4 DEBT_{i,t-1} + \beta_5 PERIOD_{i,t} + \beta_6 (PERIOD_{i,t} \times EPS_{i,t}) + \beta_7 (PERIOD_{i,t} \times DPS_{i,t-1}) + \beta_8 (PERIOD_{i,t} \times DEBT_{i,t}) + \beta_9 (PERIOD_{i,t} \times DEBT_{i,t-1}) + \sum_{j=1}^{n} \beta_j INDUSTRY_{j,i,t} + u_{i,t},$$

where $DPS_{i,t}$ is the current dividends per share, $EPS_{i,t}$ is the current earnings per share, and $DEBT_{i,t}$ is the current debt ratio (measured as total debt divided by total assets) for firm *i* at year *t*; $EPS_{i,t-1}$ is the lagged earnings per share, $DPS_{i,t-1}$ is the lagged dividends per share, and $DEBT_{i,t-1}$ is the lagged debt ratio for firm *i* that distributed in year *t*-1 (previous year); $PERIOD_{i,t}$ is a dummy taking a value of 0 for the sub-period 2003-2008 and 1 for the sub-period 2009-2012; $(PERIOD_{i,t} \times EPS_{i,t})$, $(PERIOD_{i,t} \times EPS_{i,t-1})$, $(PERIOD_{i,t} \times DPS_{i,t-1})$, $(PERIOD_{i,t} \times DEBT_{i,t})$ and $(PERIOD_{i,t} \times DEBT_{i,t-1})$ are the interaction terms between period dummy and current earnings per share, lagged earnings per share, lagged dividends per share, current debt ratio and lagged debt ratio, respectively; $INDUSTRY_{j,i,t}$ is a vector of dummy variables representing 14 different industries (based on ICB codes).

Table 5. Results of Pooled OLS Estimates for Ownership Structure Effect on Lintner Model Specification

Dependent variable: $DPS_{i,t}$

Model 1	**Subsample A**		**Subsample B**		**Subsample C**		**Subsample D**	
Independent variables:	All firms	Dividend payers	All firms	Dividend payers	All firms	Dividend payers	All firms	Dividend payers
$EPS_{i,t}$	0.074**	0.081**	0.156***	0.169***	0.116***	0.130***	0.036**	0.040**
	(2.08)	(2.13)	(6.83)	(7.11)	(4.96)	(5.89)	(2.26)	(2.33)
$DPS_{i,t-1}$	0.751***	0.749***	0.047***	0.051***	0.536***	0.530***	0.638***	0.640***
	(5.10)	(4.89)	(3.86)	(3.89)	(4.47)	(3.95)	(3.07)	(3.15)
$PERIOD_{i,t}$	−0.022*	−0.046*	−0.106***	−0.107***	−0.019*	−0.035*	−0.055**	−0.069**
	(−1.17)	(−1.86)	(−4.36)	(−4.42)	(−1.88)	(−1.91)	(−2.12)	(−2.38)
$PERIOD_{i,t}$ x $EPS_{i,t}$	−0.014**	−0.015**	−0.029***	−0.034***	−0.024**	−0.035**	−0.008**	−0.009**
	(−2.40)	(−2.55)	(−6.71)	(−7.30)	(−2.04)	(−2.16)	(−2.21)	(−2.39)
$PERIOD_{i,t}$ x $DPS_{i,t-1}$	0.031***	0.028***	0.017***	0.023***	0.062***	0.066***	0.052***	0.058***
	(10.48)	(9.14)	(6.97)	(8.59)	(5.79)	(6.49)	(3.47)	(3.54)
Constant	0.035	0.052	0.062	0.055	0.027*	0.041*	0.058	0.071
	(0.61)	(1.17)	(1.10)	(1.02)	(1.69)	(1.81)	(1.40)	(1.54)
INDUSTRY	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PERIOD = 0 (Between 2003 and 2008)								
Target payout ratio (r_1)	0.297	0.323	0.164	0.178	0.250	0.277	0.099	0.111
Speed of adjustment (c_1)	0.249	0.251	0.953	0.949	0.464	0.470	0.362	0.360
PERIOD = 1 (Between 2009 and 2012)								
Target payout ratio (r_2)	0.274	0.296	0.136	0.145	0.229	0.235	0.090	0.103
Speed of adjustment (c_2)	0.218	0.223	0.936	0.926	0.402	0.404	0.311	0.302
Number of observations	1,056	497	412	322	195	162	183	140
F-statistic	52.45***	35.83***	21.63***	20.92***	65.69***	55.56***	41.48***	36.79***
R-squared	46.21%	44.42%	63.37%	62.80%	56.54%	55.03%	47.95%	45.55%

Notes: This table reports coefficients and t-statistics in the parenthesis. The pooled OLS models are tested using White's corrected heteroscedasticity robust regressions. ***, ** and * stand for significance at the 1%, 5% and 10% levels, respectively.

Subsample A: Firms with family ownership concentration and control.
Subsample B: Firms with only non-family blockholders (such as foreign and domestic financial institutions and the state).
Subsample C: Firms with both family and non-family blockholders.
Subsample D: Firm with no blockholders (dispersed ownership structures with single ownership below 5%).

Table 6. Results of System GMM Estimates for Ownership Structure Effect on Lintner Model Specification

Dependent variable: $DPS_{i,t}$

Model 1	**Subsample A**		**Subsample B**		**Subsample C**		**Subsample D**	
Independent variables:	All firms	Dividend payers	All firms	Dividend payers	All firms	Dividend payers	All firms	Dividend payers
$EPS_{i,t}$	0.078*** (2.96)	0.092*** (3.03)	0.160*** (15.80)	0.172*** (16.43)	0.117*** (5.38)	0.136*** (6.87)	0.039** (2.34)	0.043** (2.48)
$DPS_{i,t-1}$	0.734*** (6.21)	0.727*** (5.77)	0.038*** (10.09)	0.043*** (11.47)	0.514*** (6.51)	0.506*** (6.40)	0.620*** (5.94)	0.625*** (6.26)
$PERIOD_{i,t}$	−0.041** (−2.30)	−0.066** (−2.42)	−0.091*** (−2.98)	−0.099*** (−3.12)	−0.029** (−1.74)	−0.034** (−1.89)	−0.060** (−2.46)	−0.073** (−2.53)
$PERIOD_{i,t}$ x $EPS_{i,t}$	−0.020*** (−6.13)	−0.018*** (−5.98)	−0.038*** (−5.34)	−0.042*** (−5.59)	−0.026*** (−4.73)	−0.030*** (−4.91)	−0.011*** (−2.65)	−0.013*** (−2.92)
$PERIOD_{i,t}$ x $DPS_{i,t-1}$	0.046*** (8.63)	0.032*** (7.11)	0.021*** (3.57)	0.028*** (3.66)	0.067*** (10.04)	0.078*** (10.83)	0.059*** (3.71)	0.061*** (3.95)
Constant	0.053 (0.40)	0.074 (0.52)	0.076 (1.54)	0.070 (1.48)	0.038** (2.14)	0.052** (2.31)	0.062 (0.75)	0.084 (0.96)
INDUSTRY	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PERIOD = 0 (Between 2003 and 2008)								
Target payout ratio (r_1)	0.293	0.337	0.166	0.180	0.241	0.275	0.103	0.115
Speed of adjustment (c_1)	0.266	0.273	0.962	0.957	0.486	0.494	0.380	0.375
PERIOD = 1 (Between 2009 and 2012)								
Target payout ratio (r_2)	0.264	0.307	0.130	0.140	0.217	0.255	0.087	0.096
Speed of adjustment (c_2)	0.220	0.241	0.941	0.929	0.419	0.416	0.321	0.314
Number of observations	1,056	497	412	322	195	162	183	140
F-statistic	36.52***	24.76***	20.37***	18.63***	41.05***	47.22***	81.11***	77.02***
Arellano-Bond test for (AR1)	Pr > z = 0.00	Pr > z = 0.00	Pr > z = 0.00	Pr > z = 0.00	Pr > z = 0.00	Pr > z = 0.00	Pr > z = 0.00	Pr > z = 0.00
Arellano-Bond test for (AR2)	Pr > z = 0.49	Pr > z = 0.51	Pr > z = 0.28	Pr > z = 0.27	Pr > z = 0.46	Pr > z = 0.45	Pr > z = 0.70	Pr > z = 0.72
Hansen overidentifying test	Pr > chi^2 = 0.41	Pr > chi^2 = 0.46	Pr > chi^2 = 0.90	Pr > chi^2 = 0.84	Pr > chi^2 = 0.77	Pr > chi^2 = 0.74	Pr > chi^2 = 0.89	Pr > chi^2 = 0.91
Number of instruments	60	60	60	60	60	60	60	60

Notes: This table reports coefficients and t-statistics in the parenthesis. The two-step, robust (Windmeijer's standard error correction), small (corrections that results in *t* instead of *z* statistic for the coefficients and *F* instead of *Wald* X^2 test for overall fit) and orthogonal (maximising sample size in panels with gaps) commands are used to make the system GMM estimates even more robust. ***, ** and * stand for significance at the 1%, 5% and 10% levels, respectively.

Subsample A: Firms with family ownership concentration and control.
Subsample B: Firms with only non-family blockholders (such as foreign and domestic financial institutions and the state).
Subsample C: Firms with both family and non-family blockholders.
Subsample D: Firm with no blockholders (dispersed ownership structures with single ownership below 5%).

Table 7. Results of Logit Model Estimates for Dividend Payment Decisions

Dependent variable: $DPAY_{i,t}$ *(0/1)*

Logit Model	**PANEL A:** Pooled Logit		**PANEL B:** Random Effects Logit	
Independent variables:	Coefficient estimates	Marginal effects	Coefficient estimates	Marginal effects
$ROA_{i,t-1}$	10.755*** (8.48)	1.896*** (8.35)	11.035*** (5.99)	1.137*** (6.29)
$INVEST_{i,t-1}$	−0.779** (−2.45)	−0.135** (−2.57)	−1.490*** (−3.02)	−0.150*** (−3.16)
$DEBT_{i,t-1}$	−2.174*** (−4.87)	−0.377*** (−5.01)	−2.701*** (−2.63)	−0.278*** (−2.84)
$AGE_{i,t-1}$	0.294* (1.69)	0.051* (1.71)	0.637** (2.24)	0.065** (2.55)
$SIZE_{i,t-1}$	0.665*** (9.67)	0.115*** (7.55)	0.992*** (7.31)	0.102*** (8.51)
$PERIOD_{i,t}$	−1.169 (−1.18)	−0.203 (−1.17)	−1.392 (−1.00)	−0.143 (−1.03)
$PERIOD_{i,t}$ x $ROA_{i,t-1}$	1.170 (0.56)	0.205 (0.56)	0.350 (0.16)	0.036 (0.16)
$PERIOD_{i,t}$ x $INVEST_{i,t-1}$	−0.988 (−1.00)	−0.173 (−1.01)	−0.392 (−0.29)	−0.040 (−0.29)
$PERIOD_{i,t}$ x $DEBT_{i,t-1}$	−0.578 (−0.90)	−0.100 (−0.91)	−1.621 (−1.43)	−0.167 (−1.43)
$PERIOD_{i,t}$ x $AGE_{i,t-1}$	0.401 (1.52)	0.070 (1.52)	0.655 (1.63)	0.067 (1.63)
$PERIOD_{i,t}$ x $SIZE_{i,t-1}$	0.340 (0.40)	0.059 (0.39)	0.122 (0.97)	0.025 (0.97)
Constant	−4.077*** (−5.97)		−5.129*** (−6.60)	
INDUSTRY	Yes	Yes	Yes	Yes
Number of observations	1,846	1,846	1,846	1,846
Wald X^2	403.69***		183.31***	
Pseudo R^2	35.48%			
Rho value			0.6123	
Likelihood ratio test			277.75***	

Notes: This table reports the logit estimates and z-statistics in the parenthesis. Independent variables are one-year lagged. The pooled models are tested using White's corrected heteroscedasticity robust regressions. ***, ** and * stand for significance at the 1%, 5% and 10% levels, respectively.