What Do We Know About the Dividend Puzzle? – A Literature Survey*

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Abstract

This paper aims to shed light on the ongoing debate of dividend policy, which is considered one of the most controversial topics in corporate finance literature. We, first, outline the main theoretical arguments of dividend policy and then critically discuss the most important and influential previous empirical studies in the dividend literature. We detect that no general consensus has yet been reached after many decades of investigation, despite extensive debate and countless research. Consequently, the main motivation for paying dividends is still unsolved and thus remains as a puzzle. In addition, there is no doubt that carrying the dividend debate into the context of emerging markets attaches more pieces to this puzzle.

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1. Introduction

Dividend policy is one of the most controversial topics in corporate finance literature. The debate of dividend policy has attracted a great deal of attention from finance academics and has been the subject to intensive theoretical modelling and voluminous empirical research – for instance, some researchers have developed and empirically tested various models to explain why companies pay dividends (e.g., Lintner, 1956; Brennan, 1970; Elton and Gruber, 1970; Rozeff, 1982), whereas others have surveyed corporate managers to learn their thoughts in explaining dividend behaviour (e.g., Baker et al., 1985, 2002, 2008; Pruitt and Gitman, 1991; Brav et al., 2005). However, despite much research and extensive debate, the actual motivation for paying dividends still remains unsolved.

Black (1976, p.5) once described this lack of consensus as the "dividend puzzle" and stated that "The harder we look at the dividend picture, the more it seems like a puzzle, with pieces that just don't fit together". Although Black (1976) came to this conclusion four decades ago, his observation still seems valid as there is no definite theory on dividends. In the same vein, Brealey and Myers (2003) list dividends as one of the ten important unsolved problems in finance in their textbook. Additionally, the leading dividend policy theories are originally formulated based on developed markets and majority of earlier empirical research on dividend policy is focused mainly on the U.S., followed by the U.K. Therefore, less is known about dividend behaviour and the explanatory power of models for other countries, particularly developing (emerging) markets. Considering the growing importance of emerging markets in terms of global equity investments, these markets have recently started attracting considerable attention from international investors. Especially during the last two decades, a growing amount of empirical studies (such as, Glen et al., 1995; La Porta et al., 2000;

Aivazian et al., 2003) investigate dividend policy in developing countries, and hence emerging markets add more pieces to the dividend puzzle.

In this paper, we, therefore, offer a literature review by outlining the main theories and explanations of dividend policy, and presenting results from the most influential empirical studies in the dividend literature. This because, various opposing theoretical standing points and implications of dividend payments motivate us to shed light on the leading theoretical arguments and empirical findings and their contradictory conclusions in order to identify whether divided policy is still a puzzle after many decades of the ongoing research. Moreover, this paper differs from previous literature review studies (see, for among others, Lease et al., 2000; Frankfurter and Wood, 2003; Al-Malkawi et al., 2010) by incorporating empirical evidence related to dividend policy in the context of many different emerging markets. Accordingly, the study attempts to provide an updated and more comprehensive literature survey by examining the relationship between theory and practice from both developed and emerging economies, which is vital to detect new insights for paying dividends and to make suggestions for further research on this topic.

The remainder of this paper has the following structure. Section 2 outlines the main dividend theories, whereas Section 3 reviews the selective empirical research on dividend policy from both developed and developing markets. Section 4 presents what we learn about dividend policy from our detailed literature survey and Section 5 concludes the paper.

2. Dividend Policy Theories

Although dividend policy literature contains many explanations, some of them have been widely discussed and empirically tested in the hope of solving dividend puzzle. Thus, we will discuss major dividend policy theories in this section. Essentially, three main contradictory concepts can be observed in the literature. The first one is Miller and Modigliani (M&M)'s (1961) "dividend irrelevance theory", which posits that a managed dividend policy is irrelevant under the assumptions of a perfect capital market (that is, dividend payments have no effect on firm value and no dividend policy is superior to another in a frictionless world). This is because wealth of shareholders is determined by the income generated by the investment decisions that mangers make, not by how they distribute that income.[1]

The second approach suggests that dividend payments can increase firm value and shareholder wealth. For instance, the "bird-in-the-hand hypothesis" is a frequently heard argument that favours dividends. This hypothesis contends that since dividend payments are less risky than capital gains, dividend paying firms bring forward cash inflows to shareholders and reduce the uncertainty associated with future cash flows. Considering two identical firms, where one pays dividends while the other does not, the shares of the dividend paying firm will be safer than the shares of the non-dividend-paying firm, which in turn will increase the share price of the dividend paying firm. as compared to the non- dividend-paying firm. Accordingly, firms should offer higher dividend payouts in order to maximise their share prices and thus enhance their firm values (Gordon, 1959; 1963; Gordon and Shapiro, 1956).

"Signalling theory" is one of the most widely studied explanations, arguing that an information asymmetry exists in where a firm's management has a better understanding of the firm's true value as compared to outside investors, who only have access to public

[1] The proof of M&M's dividend irrelevance proposition is illustrated in Appendix A.

information. Therefore, managers use dividends to convey their superior information about the current situation and future prospects of their firms. According to Bhattacharya (1979), John and Williams (1985) and Miller and Rock (1985), if managers are confident about the future performance of their firms, they distribute more cash dividends to shareholders as a credible signal, whereas other firms, whose future prospects are not as good, cannot mimic the dividend payment levels of their firms. Hence, investors prefer to buy the shares of firms distributing larger dividends at higher share prices. Contrarily, firms with no or less favourable inside information (in other words, non-dividend paying firms) should experience negative price reactions. In his pioneering study, Lintner (1956) finds that managers are concerned about dividend signalling over time and suggests that managers are reluctant to cut dividends unless adverse circumstances are likely to persist, since they think dividend cuts are bad signals to the market. Lintner (1956) further detects that managers tend to make "partial adjustment" toward a target payout ratio to "smooth" dividend payment streams in the short run, and to avoid the volatility of dividends – because, managers perceive that the volatile (unstable) dividend payment streams reflect the volatility in earnings that are not good indicators about their firms' financial performance to the market.

Furthermore, Jensen and Meckling (1976), Rozeff (1982), Easterbrook (1984) and Jensen (1986) developed "agency cost theory", which derives from problems associated with the separation of management and ownership, and the differences in managerial and shareholder priorities. They argue that high dividend payments decrease the internal cash flow subject to management discretion and force companies to approach the capital market in order to meet the funding needs for new projects. Increase of costly outside capital subjects to companies to the scrutiny of the capital market for new funds and decreases the scope of overinvestment. The efficient monitoring of capital market (that is, outside professionals such as investment banks, regulators, lawyers, public accountants and potential investors) also assists to ensure that managers perform in the best interests of shareholders. Consequently, agency cost theory implies that firms with high cash flows should pay larger dividends, because a generous dividend payment reduces the amount of free cash flow under management's control and minimises the agency problems, and thus enhances firm value.

Alternatively, there is the third position that claims dividend payments can have negative consequences on firm value and shareholders wealth. For example, in the presence of the uneven tax treatment between dividends and capital gains, the "tax preference theory", developed by Brennan (1970), Elton and Gruber (1970) and Litzenberger and Ramaswamy (1979), asserts that investors who receive favourable tax treatment on capital gains may prefer shares with none or low dividend payouts. The reason is that if income tax is greater than the rate of capital gains tax, high dividend payments would increase shareholders' tax burden. Therefore, other things being equal, firms should avoid or make minimal dividend payments if they want to maximise their share prices. On the other hand, Black and Scholes (1974) and Miller and Scholes (1978) proposed the "tax clientele effect hypothesis", arguing that each investor has his/her own implied calculations of choosing between high or low cash dividends and selecting dividend policies according to their tax category circumstances. Since there are enough companies to provide these different dividend policies, investors will invest in only companies with policies that best fit their tax positions. In equilibrium, therefore, no firm can increase its value by reducing taxes through its dividend policy. In fact, this may cause a change in clientele and could be costly because of trading costs. Consequently, the tax clientele effect hypothesis supports the

dividend irrelevancy conclusion. Moreover, the "transaction cost theory" of dividends indicates that after using cheap and easily accessible internal funds to pay dividends instead of retaining for possible investment projects, firms may have to raise additional external funds to meet their investment requirements. This external financing might be costly, since there are costs associated with raising external funds, such as interest payments, underwriter fees, administration costs, management time and legal expenses. Hence, the transaction cost theory points out that, after paying dividends, firms may face heavy burden of transaction costs of external financing for possible investment projects (Bhattacharya, 1979; Rozeff, 1982; Miller and Rock, 1985).

Dividend debate is not limited to these three opposing arguments, since there are other theories that add more complexity to the dividend puzzle. Among those, the "pecking order theory", developed by Myers (1984) and Myers and Majluf (1984), which posits that firms should adjust their dividend policies to their investment opportunities. This theory argues that firms seeking to finance new investments prefer to use funds according to a hierarchy; first internal funds, then debt issuance and finally equity issuance as a last resort. Accordingly, better firms should have lower leverage[2] and lower short-term payout policies to control investment opportunities. Hence, in order to prevent external financing and make more use of internal funds for possible investments, one obvious way to accomplish this is by reducing the amounts of dividends distributed to shareholders. Furthermore, a relatively new explanation, namely the "catering theory of dividends" offered by Baker and Wurgler (2004a; 2004b), postulates that investor preferences for dividends may change over time. Therefore, managers should recognise and cater to shifts in investors preferences for dividends – that is, managers cater to investors by distributing dividends when investors put a premium on such stocks and they will omit dividends when investors highly rate firms that do not pay dividends. Consequently, the theory suggests that dividends are highly relevant to share value but in different directions at different times.

Grullon et al. (2002) purpose another explanation that attempts to link firm age with dividend policy, which is known as the "maturity hypothesis". This explanation suggests that higher dividend increases are a sign of change in a firm's life cycle. In particular, firms are likely to pay higher dividends as they transit from growth to a more mature phase. This change occurs because their investment opportunities and growth rates become slower or even decline, and they start generating larger amounts of free cash flows. Finally, the "residual dividend policy" recommends that firms should pay dividends only when their internally generated earnings are not fully exhausted for investment projects. Thus, dividend payments should ideally be the residuals of cash produced by the firms' operations after undertaking all positive net present value (NPV) investments. Following a residual dividend policy, the amount of residual dividend tends to be highly volatile and often zero (Lease et al., 2000).

After all, we observe that the major dividend policy theories are involved with the relaxation of Miller and Modigliani's (1961) perfect capital market assumptions and dealt with dividends in the presence of various market imperfections (e.g., differential tax rates, information asymmetries, agency problems and transaction costs). However, these theories provide inconclusive or even contradictory explanations with respect to dividends. Thus, it

[2] If firms, however, experience high growth opportunities, they may have high leverage (given that investment requires more than the internally generated funds) and therefore these firms should pay out none or very low dividends (Myers and Majluf, 1984).

can be concluded that none of these theories explain the dividend puzzle single-handedly, consistent with Frankfurter and Wood's (2003, p.167) statement that "No theory based on the economic paradigm developed thus far completely explains the persistence of corporate dividend policy". The major reason for this failure might be because financial economists have been trying hard to develop a universal or "one-size-fits-all" approach, despite the well- known reality that dividend policy may be sensitive to such aspects as firm characteristics, corporate governance and legal environment (Baker et al., 2008).

Since there is no single theory to explain the dividend puzzle alone, researchers have attempted to seek an integrated model that combines various theories in examining dividend behaviour for the best explanation of corporate dividend policy. At this point, it is worth reviewing how these main dividend theories are empirically tested, and what implications there are by applying them on different markets, during different period of times, using different methodologies by many researchers. Therefore, we will present a summary of selective empirical studies from both developed and developing markets in the following section.

3. Empirical Studies of Dividend Policy

Although empirical research involving dividend policy is voluminous and continuously grows, the main empirical studies generally focus on the three big imperfections (Lease et al., 2000) – namely, the signalling and agency cost theories, and tax-related explanations. Since it is not possible to provide a full review of all literature, we, therefore, select and discuss the most important and influential empirical studies in dividend policy around these three main theories.

3.1 Empirical studies of the signalling theory

We classify the following selective review of empirical research on the signalling explanation into two sub-sections: (i) studies of the partial adjustment model and (ii) studies of the information content of dividends hypothesis.

3.1.1 Studies of the partial adjustment model

In his classic study, Lintner (1956) presents survey evidence that U.S. managers adopt extremely deliberate dividend policies, contrary to the dividend irrelevance theory. Lintner finds that managers set cash dividend payments in accordance with earnings and lagged dividends – they make *partial adjustments* to a target payout ratio to smooth dividend payments streams in the short-run, rather than matching immediately with the changes in earnings, hence pursue stable dividend policies. Lintner further detects that U.S. managers only increase dividend payments when they believe that earnings can sustain higher dividend levels permanently. They are also reluctant to cut dividends, unless adverse circumstances are likely to persist, as dividend cuts are bad signals to the market.

Based on his survey research, Lintner develops a partial adjustment model to explain the dividend payment process. He suggests that firms have their target dividend levels, which they determine according to their earnings and target payout ratios in a particular year, as below:

$$D^*_{i,t} = r_i E_{i,t}, \quad (1)$$

where $D^*_{i,t}$ is the target dividend payment, r_i is the target payout ratio and $E_{i,t}$ is the net earnings for firm *i* at time *t*. Lintner argues that firms will only adjust dividends partially

toward the target dividend level; hence, the actual difference in dividend payments from year $t-1$ to year t can be expressed by:

$$D_{i,t} - D_{i,t-1} = \alpha_i + c_i(D^*_{i,t} - D_{i,t-1}) + \varepsilon_{i,t}\,, \tag{2}$$

where α_i is the intercept term, c_i is the speed of adjustment coefficient, $\varepsilon_{i,t}$ is the error term, $D_{i,t}$ is the actual dividend payment and $D_{i,t-1}$ is the previous year's ($t-1$) dividend payment. By substituting $r_i E_{i,t}$ for the target dividend payment $D^*_{i,t}$ in the model and rearranging Equation (2), the following equation can be equivalently obtained:

$$D_{i,t} = \alpha_i + \beta_1 E_{i,t} + \beta_2 D_{i,t-1} + \varepsilon_{i,t}\,, \tag{3}$$

where $\beta_1 = c_i r_i$ and $\beta_2 = (1-c_i)$. According to Lintner (1956), the constant (intercept) term (α_i) should be positive to show management's unwillingness to decrease dividends, and the speed of adjustment coefficient (c_i) reflects the stability in dividend changes and calculates the adjustment speed toward the target payout ratio (r_i) relative to earnings changes. Hence, the value c_i illustrates the dividend smoothing behaviour of firm i to the variations in the earnings levels – that is, a higher value of c_i implies less dividend smoothing, in other words unstable dividend policy, and vice-versa.

Many studies have used Lintner's (1956) partial adjustment model to examine the stability of dividends in different countries (both developed and developing markets) at different periods of time. For instance, Darling (1957) is among first scholars who extend the Lintner model. He runs a number of multiple regression tests on an annual dataset of manufacturing U.S. firms and reports consistent results with Lintner's findings. Fama and Babiak (1968) test several specifications of the partial adjustment model on the firm-level data for U.S. industrial firms, rather than aggregate data. Their results show that the Lintner model also works well on individual firm-level dataset. Dewenter and Warther (1998) compare dividend policies of U.S. and Japanese firms and present evidence that supports the notion of Lintner's speed of adjustment – they find that U.S. dividends are much smoother than before and Japanese firms cut dividends in response to poor performance more quickly than U.S. firms. McDonald et al.'s (1975) estimates from the basic and modified Lintner models show that dividend payments of French firms are well explained by earnings and past dividends in the dividend model of Lintner. Similarly, Chateau (1979) tests the partial adjustment model, using alternative economic procedures, and reports that Lintner's explanation of dividend behaviour works well in Canada.

Survey researchers have taken another path to study dividend policy. Instead of using secondary (published) data, they have provided direct evidence from corporate managers by asking their perception about dividends (Baker et al., 2002). For example, Baker et al. (1985) find that the major determinants of dividend policy decisions still appear markedly similar to Lintner's findings. Pruitt and Gitman's (1991) survey findings show that current year earnings and lagged dividends are the major factors affecting current year dividend payments. Likewise, Baker et al.'s (2002) results are strongly consistent with Lintner's proposition and stress the dividend continuity. In another study, Brav et al. (2005) also show support for Lintner's behaviour model – especially, they indicate that one of Lintner's key findings still holds; managers are reluctant to cut dividends and the current level of dividend payments is taken as given unless adverse circumstances are likely to persist. In addition to above surveys conducted in the U.S., a string of studies providing

survey evidence in different countries (from both developed and emerging markets), such as Baker et al. (2006) in Norway, Baker et al. (2008) in Canada, Baker and Powell (2012) in Indonesia, Baker and Kapoor (2015) in India and Baker et al. (2018) in Turkey, have all reported general support for Lintner's partial adjustment model.

Mookerjee's (1992) research is one of the earliest studies that quantitatively apply the Lintner model to different developing markets. Mookerjee finds that the basic Lintner model works successfully in explaining dividend payment behaviour in India. However, Adaoglu (2000) reports that Turkish-listed firms do not smooth dividend payments, inconsistent with Lintner's argument, and hence follow unstable dividend policies unlike their counterparts in developed markets. Contrarily, Pandey (2001) detects that Malaysian firms rely both on past dividends and current earnings in setting the current period's dividend payments, but they have low smoothing and less stable dividend policies, compared to listed-firms in developed markets. Aivazian et al. (2003) compare the dividend behaviour of firms operating in eight different developing countries with the dividend policies of a control sample of U.S. firms. They report that the Lintner model still works well for U.S. firms, whereas it does not work that well for the emerging market companies. Al-Najjar (2009) finds that Jordanian firms have their target payout ratios and partially adjust dividends toward their targets, although relatively faster compared to U.S. companies. Further, Chemmanur et al. (2010) compare dividend policies of firms in Hong Kong and the U.S., and reveal that, compared to U.S. firms, Hong Kong firms follow a more flexible dividend policy commensurate with current year earnings. Most recently, Al-Najjar and Kilincarslan (2017) investigate the firm-level cash dividend behaviour of publicly listed firms in Turkey after the implementation of major reforms and significant regulatory changes regarding mandatory dividend payout rules starting with the fiscal year 2003. Unlike Adaoglu's (2000) earlier findings, they find that Turkish-listed firms have long-term payout ratios and adjust their cash dividends by a moderate level of smoothing, as suggested by Lintner, and thus adopt stable dividend policies in the post-2003 period, although less stable policies compared to their
U.S. counterparts.

3.1.2 Studies of the information content of dividends hypothesis

The information content of dividends hypothesis asserts that managers have prior inside information about their firms' future performance. Hence, they use cash dividend announcements to convey changes in their expectations about future prospects of their firm to the public. Since dividend decisions are almost exclusively at managers' prudence and if they are confident about the future performance of their firms, they distribute larger cash dividends as a good signal to investors. Conversely, dividend decreases are seen as a bad signal that managers anticipate permanently lower cash flows (Bhattacharya, 1979; John and Williams, 1985; Miller and Rock, 1985).

Aharony and Swary (1980) examine quarterly dividend announcements that follow and that precede quarterly earnings announcements. They find that firms those announced dividend increases realise positive abnormal returns; especially, most of the significant abnormal returns occur during the dividend announcement and dividend declaration dates (two-day excess return) for both groups whether earnings announcements precede or follow dividend announcements (0.72% and 1.03%, respectively). A mirror argument applies to dividend decreases with two-day excess returns of −3.76% and −2.82%, respectively – noticeably, abnormal returns for the dividend decreases are much greater than those of dividend increases. Aharony and Swary conclude that changes in quarterly cash dividends

provide information beyond that provided by corresponding quarterly earning numbers. Healy and Palepu (1988) investigate the market reaction to dividend initiation and omission announcements. Their results exhibit that the mean two-day excess return of 3.9% for initiations and −9.5% for omissions. The results further show that there are significant earnings increases for as many as five years prior to, for the year of and two years following a dividend initiation, whereas dividend-omitting firms have earnings decreases for two years prior to and in the year of the dividend omission announcements. Healy and Palepu suggest that dividend initiation and omission announcements appear to convey incremental information about firms' future earnings performance.

Michaely et al. (1995) also study both the short-term and long-term effects of dividend initiation and omission announcements. Consistent with Healy and Palepu, they find that omission announcements lead to a mean price drop of about 7%, whereas initiations yield a mean price increase of over 3% in the short-run. They further report quite consistent long-term drift patterns, which show that omissions are associated with negative, while initiations are associated with positive excess returns. However, Benartzi et al. (1997) reveal that there is a strong past and concurrent link between earnings and dividend changes, and therefore reject the hypothesis that changes in dividends signal information about future earnings changes. Jensen and Johnson (1995) specifically concentrate on dividend drop announcements instead of dividend changes. Their analysis shows that the dividend cuts tend to signal the beginning of restructuring activities and turnaround in financial decline, leading to improvement in liquidity positions and reduction in the level of debt. Accordingly, they suggest that dividend reductions do not necessarily signal a decline in earnings.

Akhigbe and Madura (1996) present evidence in favour of the information content of dividends hypothesis; that is, firms have positive long-term share price performance after dividend initiations, whereas firms omitting dividends experience unfavourable price performance in the long-run. DeAngelo et al. (1996) investigate whether firms use dividends to signal their views of future earnings prospects by focusing on firms whose annual earnings suddenly declined after nine or more consecutive years of a stable growth. Their results offer no support for the argument that dividend increases in the year of downturn are useful devices of improved future earnings performance. Contrarily, Lipson et al. (1998) study the performance of newly public firms that initiated dividends and those that did not, and they find support for dividend signalling since only the initiating firms have favourable earnings surprises in the first and second year following the dividend initiations.

Furthermore, Altiok-Yilmaz and Akben-Selcuk (2010) analyse the market price reaction to dividend announcements in the Turkish stock market. They report that the market reacts positively to dividend increases and negatively to dividend decreases, whereas it does not react when dividends are not changed, consistent with the information content of dividends hypothesis. Dasilas and Leventis (2011) examine the market stock price and trading volume responses to cash dividend distribution announcements in the Athens Stock Exchange. They also show support for the information content of dividends hypothesis, revealing that there is a statistically significant market reaction on the dividend announcement day. Al-Yahyaee et al. (2011) provide more evidence in favour of the argument that cash dividend announcements convey information to the market from the Muscat Securities Market; that is, announcements of dividend increases (decreases) involve

with increased (decreased) stock prices, while firms that do not change their dividend payments experience insignificant negative stock returns.

Fairchild et al. (2014) analyse dividend changes in the Stock Exchange of Thailand and report no significant relation between dividend changes (either increases or decreases) and future profitability changes. Instead, they find that dividend changes are functions of a firm's past and current financial performance. Liu and Chen (2015) retest the dividend signalling, arguing that managers change dividends to convey their expectation of future equity-scaled earnings performance. However, their results show that dividend changes have no significant ability to predict equity-scaled earnings changes, which are subject to firm capital structure decisions, due to the noise induced by the motives other than the prospects of signalling. Liu and Chen (2015) conclude that if investors constantly cannot recognise the signalling purpose and do not consider dividend changes useful devices in predicting future earnings prospects, managers may at some point stop using dividend changes to signal their asymmetric information about firm earnings performances.

Table 1 summarises the empirical studies of the signalling theory of dividends that are reviewed here.

(Insert Table 1 about here)

3.2 Empirical studies of the agency cost theory

We classify the following selective review of empirical research on the agency cost theory into three sub-sections: (i) studies of the principal-agent conflict, (ii) studies of the principal-principal conflict, and (iii) studies of the shareholder-bondholder conflict.

3.2.1 Studies of the principal-agent conflict

Berle and Means (1932) draw attention to the prevalence of widely held corporations in which ownership structure of firms is dispersed among small shareholders but the control is concentrated in the hands of managers. The Berle and Means widely held corporation is extensively accepted in the finance literature as a common organisational form for large firms in the richest common law countries such as the U.S., the U.K., Canada, and Australia. Hence, one of the most studied explanations for why firms pay dividends is the agency cost motive, which derives from the problems associated with the separation of management (the agent) and ownership (the principal), and the differences in managerial and shareholder priorities, also known as the "principal-agent conflict" (Jensen and Meckling, 1976). This explanation argues that cash dividends can be used to mitigate agency problems in a company by reducing free cash flows and forcing management to enter the capital market for financing, hence leading to induce monitoring by the market (Rozeff, 1982; Easterbrook, 1984; Jensen, 1986).

The function of dividends as a monitoring mechanism of managerial activities is grounded by Easterbrook (1984), who argues that dividends play a role in controlling agency related problems by facilitating primary capital market monitoring on firms' activities and performance, since dividend payments force firms to raise capital more often in capital markets. However, the dividend-induced monitoring for shareholders may not be costless, such as tax burden or issuance costs. Therefore, Easterbrook also indicates alternative non-dividend monitoring devices for controlling agency cost (e.g., high growth opportunities or large shareholders). Crutchley and Hansen (1989) provide support for the monitoring rationale for dividends and the simultaneity of financial policies (e.g., dividends, leverage

policy and managerial ownership) in controlling the agency cost in a most efficient way. Born and Rimbey (1993) examine the shareholder responses to firms that initiated or resumed a cash dividend policy. Their findings present that firms that announce both capital financing and dividend increases enjoy higher abnormal returns than firms that announce dividend increases alone, which is consistent with Easterbrook's capital market monitoring rationale. Hansen et al. (1994) present evidence that U.S. regulated electric utilities use dividend- induced monitoring for controlling agency problems. Noronha et al. (1996) find that the monitoring role of dividends and the simultaneity between capital structure and dividend decisions are dependent on specific firm characteristics – particularly, the dividend decisions of firms with less alternative non-dividend devices (i.e., the incentive-based managerial compensation and the existence of a large shareholder) and low growth are made in line with Easterbrook's monitoring explanation, whereas firms with alternative mechanisms and high growth are not likely to use dividends to control agency problems, and no interaction between dividend and capital structure decisions is observed in such firms.

Moreover, Jensen's (1986) free cash flow hypothesis posits that managers with large amount of excess cash (free cash flow) may act in ways not in shareholders' best interests. Instead of undertaking positive NPV investment projects by this cash, they might overinvest by accepting marginal investment projects with negative NPVs. Hence, substantial cash dividend payments would lessen the amount of free cash flow that managers may misuse and therefore reduce the scope of overinvestment. Lang and Litzenberger (1989) follow Jensen's free cash flow argument and call the extended form "the overinvestment hypothesis". They argue that overinvesting firms experience positive abnormal stock returns, following a substantial increase in dividends. This is because the market anticipates this action as a reduction in the overinvestment problem (a good indicator), since increased dividends decrease the amount of cash than would have been otherwise invested in suboptimal projects. Contrarily, substantial dividend decreases suggest that the potential for the overinvestment problem may have increased (a bad indicator).[3] Furthermore, Agrawal and Jayaraman (1994) find that dividends, debt and managerial ownership are served as alternative mechanisms to reduce the possible corruption related to the agency cost of free cash flow. Similarly, Johnson's (1995) empirical results also show that debt and dividends are substitutes for reducing agency costs of free cash flows.

Rozeff (1982) supports the role of dividends in reducing agency costs but also indicates that a more generous dividend policy leads a firm to raise external finance that might be associated with increased transaction costs. Accordingly, Rozeff develops the cost minimisation model, which combines transaction costs and agency costs to an optimal dividend policy, as illustrated below:

$$PAY = \alpha - \beta_1 INS - \beta_2 GROW1 - \beta_3 GROW2 - \beta_4 BETA + \beta_5 STOCK + \varepsilon, \quad (4)$$

[3] Lang and Litzenberger use Tobin's Q (market-to-book ratio) as a proxy for investment opportunity to distinguish between overinvesting and value-maximising firms. They assume that a firm with a Q ratio which exceeds 1 is a value-maximizing firm, because the market value reflects the book value plus the positive NPV of the investment. Using the same rationale, a firm with a Q ratio is less than 1 indicates overinvestment, where managers of those firms are involved in substantial free cash flows invested in negative NPV projects.

where PAY is the dividend payout ratio, INS is the percentage of stock owned by insiders, GROW1 is the past growth rate of revenues, GROW2 is the forecasted growth rate of revenues, BETA is the beta coefficient of returns, and STOCK is the natural logarithm of the number of common shareholders.[4] Rozeff tests his cost minimisation model on a large sample of U.S. firms and reports that the model works well in explaining the cross-sectional variability in payout ratio across firms.

Lloyd et al.'s (1985) research is one of the first studies to replicate and expand the work of Rozeff. They present credibility to the cost minimisation model and reveal that firm size is also an important explanatory variable that has a positive impact on the payout ratio. Likewise, Schooley and Barney (1994) provide support to the Rozeff model but find that the relationship between the percentage of insider ownership and dividend policy is non-monotonic. Moh'd et al. (1995) apply a number of changes to both the method and proxy variables used in the original cost minimisation model. Their results show that firms appear to adjust dividend payout in response to the agency cost/transaction cost structure, consistent with Rozeff's original findings; more importantly, this relationship holds not only across firms but through time as well. Farinha (2003) reports that, consistent with Schooley and Barney, there is a strong U-shaped relationship between dividend payouts and insider ownership in the British market. The study, also, reports strong evidence for a significant and positive impact of common shareholder dispersion on dividend payouts, in line with the existing agency cost literature.

3.2.2 Studies of the principal-principal conflict

A number of well-known cross-country studies (e.g., Shleifer and Vishny, 1997; La Porta et al., 1999; Faccio et al., 2001) present that concentrated ownership structures by large controlling shareholders (typically, families or the state) are the dominant form in most developing countries. Accordingly, the agency cost problems may function differently in highly concentrated publicly listed firms and prior findings based on the principal-agency conflict from widely held corporations in developed markets cannot readily generalise into the context of developing markets (Daily et al., 2003).

It is argued that large shareholders have better incentives and ability to act as an effective monitoring mechanism on the management. Hence, the existence of such large shareholders can mitigate the free-rider problem of monitoring managers and consequently reduces agency problems associated with the principal-agent conflict (Grossman and Hart, 1980; Demsetz and Lehn, 1985). According to La Porta et al. (1999), family owners are almost always involved in the managements of their firms by occupying top managerial positions. Their direct involvement provides greater alignment between the interests of shareholders and managers. Family control is, therefore, one of the most efficient forms of organisational governance and may bring more effective supervision on management, which leads to zero or lower owner-manager agency problems, than other large shareholders or dispersed corporations.

Nevertheless, large blockholders, especially families, increase the moral risks arising from the abuse of control rights and, when they hold almost full control, they tend to generate private benefits of control that are not shared with minority shareholders. In fact, many researchers (e.g., Shleifer and Vishny,1997; La Porta et al., 1999; Morck and Yeung,

[4] Rozeff (1982) uses two proxies for agency costs in the model, which are INS and STOCK, and employs three variables to measure transaction costs; GROW1, GROW2 and BETA, respectively.

2003; Villalonga and Amit, 2006) argue that family owners might have increased access to the use of corporate funds and powerful incentives to expropriate wealth from minority investors, due to the absence of efficient monitoring and the lack of appropriate legal shareholder protection, transparency and disclosure practices. In these cases, the salient agency problem is, therefore, expropriation of the wealth of minority owners by the controlling shareholders, which is the conflict between large blockholders (the principal) and minority shareholders (the principal), in other words the "principal-principal conflict".

La Porta et al. (2000) suggest that corporate law can provide outside investors and existing shareholders specific powers to protect their wealth against expropriation. They further argue that cash dividends can be also used to reduce the principal-principal conflict by guarantying a pro-rata payout to entire shareholders and removing corporate wealth from controlling shareholders. Accordingly, La Porta et al. propose two alternative agency models based on the legal environment and dividends, namely the "outcome model" and "substitute model".[5] They collect a cross-country sample from 33 countries that allows to compare dividend policies of companies whose minority shareholders face different risks of expropriation by corporate insiders across different countries under different legal systems. Their empirical results show that firms operating in countries with better protection of minority shareholders pay higher dividends, consistent with the outcome agency model of dividends. Also, in these economies, fast growth firms distribute lower dividends than slow growth firms, in line with the argument that legally well-protected minority shareholders tend to wait for their dividends, when investment opportunities are good. However, in poorly protected countries, shareholders are more likely to take whatever dividends they can get, regardless of investment opportunities, suggesting that this apparent misallocation of investment is most probably part of the agency cost of poor legal protection.

Having examined companies from five West European and nine East Asian countries, Faccio et al. (2001) find that family control is the predominant form of ownership both in East Asia and Western Europe. They report that the presence of multiple large shareholders increases dividend payouts in Western Europe but decreases dividend payments in East Asia. This suggests that other large owners tend to help reducing the controlling shareholder's expropriation of minority owners in Europe, whereas they appear to exacerbate it in Asia. Furthermore, Manos (2002) shows that Indian firms set their dividend payout ratios so as to minimise the sum of agency costs and the costs associated with raising external finance, providing support for the Rozeff model and the agency rationale for paying dividends. Chen et al. (2005) find that, only for small firms, there is a significant negative correlation between dividend payout and family ownership of up to 10%, and a positive relation for family ownership between 10% and 35%, in Hong Kong. Hence, they interpret their findings as the fact that controlling families tend to extract resources in Hong Kong, but when their shareholdings increase, outside investors anticipate potential expropriation by families and demand higher dividends from firms with potentially the largest agency conflicts. Wei et al. (2011) report that family firms have lower dividend payouts and lower tendencies to pay dividends than non-family firms in China. In another study, Gonzalez et al. (2014) detect that family influence in relation to the level and likelihood of dividend payments differ considerably according to the type of family involvement in Colombia. More

[5] According to the outcome model, dividends are an "outcome" of an effective legal system, whereas the substitute model posits that dividends are "substitutes" for legal protection in the countries with poor shareholder protection (La Porta et al., 2000).

recently, Al-Najjar and Kilincarslan (2016) investigate the effects of family ownership, non-family blockholders (i.e., foreign and domestic investors, and the state) and minority shareholders on dividend policy of listed firms traded in the Turkish stock exchange. Their empirical results indicate that all types of large shareholders and even minority owners have a negative impact on dividend payments. Hence, they suggest that cash dividends are not used as a monitoring mechanism by investors in Turkey and the expropriation argument through dividends for Turkish families is inconclusive.

3.2.3 Studies of the shareholder-bondholder conflict

The conflict of interest between shareholders and bondholders is another type of agency problem related to dividends. This is because dividends can be potentially used to expropriate wealth from bondholders to shareholders (Jensen and Meckling, 1976; Lease et al., 2000). Woolridge (1983) argues that if a firm finances an unexpected dividend distribution with additional debt or reducing investment, a wealth transfer between shareholders and bondholders may exist. This action could also reflect that managers aim to convey about their firms' prospects to the market. Indeed, the wealth transfer and signalling effects of dividend policy are not necessarily mutually exclusive. It is more likely that both effects are reflected in security prices, but one effect dominates the other. Accordingly, Woolridge studies the effects of unexpected dividend changes on the values of common stock, preferred stock and straight bonds related to the wealth transfer and information content hypotheses. The empirical findings reveal consistent evidence with both the wealth transfer and signalling hypotheses. However, their further tests show that the information content is the predominant hypothesis regarding unexpected dividend changes on security prices, rather than the wealth transfer.

Jayaraman and Shastri (1988) investigate stock and bond price reactions to announcements of specially designated dividends (SDDs). They argue that unexpected or extra dividend payments, such as SDDs, may cause wealth transfer from bondholders to shareholders by reducing the asset base of the firm. Their results indicate that share price reactions to SDDs are positive and statistically significant, whereas bond prices remain unaffected by such announcements. Consequently, their empirical evidence presents consistency with the information content hypothesis but provides no support for the wealth transfer hypothesis. Similarly, Long et al. (1994) report no evidence that firms manipulate dividend policy to expropriate wealth from new bondholders to shareholders. However, Dhillon and Johnson (1994) examine stock and bond reactions to dividend changes and find evidence that supports the wealth redistribution hypothesis, but they cannot still rule out the information content hypothesis completely. Further, Mathur et al. (2013) find that bondholders consider dividend payments in small amounts as a favourable signal about the future prospect of the firm, whereas they regard large dividend payments as a tendency to redistribute wealth in favour of shareholders. Tsai and Wu (2015) report that both premium bond and abnormal stock returns on dividend announcement dates are positively related to unexpected dividend changes and therefore suggest that the information content/free cash flow effect dominates the wealth transfer effect in the U.S. bond market.

Table 2 summarises the empirical studies of the agency cost theory of dividends that are reviewed here.

(Insert Table 2 about here)

3.3 Empirical studies of the tax effect

We classify the following selective review of empirical research on the tax effect into two sub-sections: (i) studies of the relationship between dividend yields and risk-adjusted returns, and (ii) studies of the ex-dividend day share price behaviour.

3.3.1 Studies of the relationship between dividend yields and risk-adjusted returns

In order to determine the relationship between tax risk-adjusted returns and dividend yields, Brennan (1970) formulates an after-tax version of the capital asset pricing model (CAPM), which maintains that a security's pre-tax excess return is linearly and positively related to its systematic risk and to its dividend yield. Brennan argues that if dividends are taxed at higher rates than capital gains, then higher pre-tax returns are associated with higher dividend yield securities, to pay off investors for the tax disadvantages of dividends. In such cases, investors, therefore, require higher pre-tax risk-adjusted returns on stocks with higher dividend yields to compensate for the tax disadvantages of these returns.

However, Black and Scholes (1974) find that the expected returns on high-yield dividend stocks are not significantly different from the expected returns on low-yield dividend stocks either before or after taxes, indicating no relationship between these two. Consequently, Black and Scholes suggest that investors invest in companies with cash dividend policies suitable for their tax circumstances, consistent with the tax clientele hypothesis. Litzenberger and Ramaswamy (1979) challenge the results of Black and Scholes and they, in fact, find a strong positive correlation between pre-tax expected returns and dividend yields of common stocks. Hence, they interpret their results as support for Brennan's model, suggesting that the positive dividend yield coefficient is the evidence of a dividend-tax effect. Nevertheless, Miller and Scholes (1982) raise objections to Litzenberger and Ramaswamy's conclusion and re-perform their tests. Miller and Scholes detect a non-significant dividend yield coefficient and therefore deduce this evidence as inconsistent with the tax effect. They further attribute the Litzenber and Ramaswamy findings to information effect rather than the tax effect. To answer this criticism, Litzenberger and Ramaswamy (1982) re-examine their analysis by employing an alternative procedure, which is solely announcement effect-free, as they claim. Their results still support their previous findings – a significant and positive dividend yield coefficient, and hence provide strong support for the tax effect hypothesis.

Blume (1980) also studies the relationship between dividend yields and risk-adjusted returns and finds a considerably more complicated relationship than what has been suggested by prior research. Thus, Blume concludes that the relation across stocks is far too complicated to be entirely explained by the tax effects. Poterba and Summers (1984) investigate tax effect in the U.K., since there had been some radical changes in the British tax regime. They find strong evidence that taxes affect the equilibrium relationship between dividend yields and returns. Hence, they suggest that taxes explain part of the positive relationship between yields and stock market returns. Moreover, Keim (1985) reports a significant non-linear relationship between dividend yields and stock returns as well as a significant effect of the month of January on this yield-return relationship. Hence, Keim (p.
487) concludes that "[…] *the observed relation between long-run dividend yields and stock returns may not be solely attributable to differences in marginal tax rates for dividends and capital gains*."

Likewise, although Kalay and Michaely (2000) find a significant positive dividend yield coefficient, they state that the well-known tax models do not explain their evidence. Hence, they suggest that their empirical evidence is in some ways related to a more complex

tax effect theory, which is yet to be developed. Park and Kim (2010) present evidence that is inconsistent with the tax-effect hypothesis in Korea, and further suggest that non-tax reasons for the yield effect exist. More recently, Lemmon and Nguyen (2015) detect a significant positive relationship between dividend yield and risk-adjusted return in Hong Kong, where no taxes exist on either dividend income or capital gains. Hence, they suggest that this positive relationship cannot be explained by taxes alone, and also conclude that non-tax factors are associated with the relationship between dividend yields and returns.

3.3.2 Studies of the ex-dividend day share behaviour

Elton and Gruber (1970) provide another tax-based argument, claiming that the ex-dividend behaviour of a firm's share prices should reflect the tax rates of its marginal long-term investors. They argue that a shareholder who sells shares before a share goes ex-dividend loses the right to the previously declared dividend. If he sells the share on the ex-dividend day, he maintains the dividend but should expect to sell it at a lower price because of this dividend retention. Accordingly, in a perfect market, the share price should drop by the full amount of the dividend on the ex-dividend day. However, if the tax rate on dividends exceeds that on capital gains, the share price on the ex-day should fall less than the amount of dividend. Consequently, one can infer the tax brackets of the marginal long-term investors from observing the ex-dividend day drop in share prices relative to dividends.

Kalay (1982), however, criticises Elton and Gruber's argument, claiming that equilibrium prices around the ex-dividend day tend to be determined, not only by the long-term investors, but also by the short-term traders. He further proposes the "short-term trading hypothesis", arguing that if the ex-dividend price drop is less than the dividend per share, it provides arbitrage profits for the short-term traders, who are tax-exempt or subject to the same tax rate on dividends and capital gains. Michaely (1991) studies share price behaviour around ex-dividend day, using the implementation of the 1986 Tax Reform Act in the U.S., which significantly reduces the difference of taxation on capital gains and dividends in 1987, and utterly eliminates the differential in 1988. Michaely finds that the tax law change has no effect on the ex-dividend share price behaviour. This means that a change in the long-term investors' tax rates does not affect the ex-day prices, which is inconsistent with the tax clientele hypothesis but it implies that the activity of short-term traders determines the share price behaviour on the ex-day.

Koski and Scruggs (1998) also report findings supporting the argument that tax- neutral dealers engage in short-term trading for arbitrage profits, which eliminates the tax effect around ex-days. Contrarily, Kaplanis (1986) provides evidence in favour of the tax effect hypothesis but offers no support for the short-trading explanation. Furthermore, Lasfer (1995) investigates share price behaviour around the ex-dividend day before and after the implementation of the 1988 Income and Corporation Taxes Act in the U.K., which considerably decreases the tax differential between dividends and capital gains. He finds that ex-day returns are not affected by short-term trading but taxation affects significantly ex- dividend day share price behaviour in the U.K. In a similar study, Bell and Jenkinson (2002) examine the impact of major changes introduced in the U.K. system of dividend taxation in July 1997. They show that the reform has an immediate impact on the largest investor class, namely pension funds, and that the valuation of dividend income differs significantly after the reform, especially for high-yielding firms. Thus, Bell and Jenkinson conclude that taxation affects the valuation of dividend income and pension funds are the effective marginal investors for high-yielding firms in the U.K.

Milonas et al. (2006) analyse the ex-dividend day stock price behaviour in China and they report overall findings consistent with the tax effect hypothesis. Rantapuska (2008) investigates the trading behaviour of investors around the ex-dividend days in Finland. The results show that investors with a preference for dividend income buy shares cum-dividend and sell ex-dividend, and vice-a-versa, consistent with the dynamic dividend clientele hypothesis. Also, investors involve with overnight arbitrage opportunities if transaction costs are low and dividend yield is high enough. Similarly, Tseng and Hu (2013) study the relationship between taxes and investor behaviour around ex-dividend days before and after the 1998 tax reform in Taiwan. They find that only domestic investors engaged in arbitrage opportunities before the reform but, after the reform, all investors (both domestic and foreign) aggressively act as short-term arbitrageurs around ex-dividend days. This is inconsistent with the argument that only tax-neutral investors play the role of arbitrageurs on the ex-day, but strongly support the dynamic dividend clientele hypothesis.

Table 3 summarises the empirical studies of the tax effect on dividends that are reviewed here.

(Insert Table 3 about here)

4. So What Have We Learnt?

As previously mentioned, the main empirical research of the dividend puzzle focuses on the three major imperfections (the asymmetric information, agency problems and taxes). After reviewing various empirical studies, we observe a number of important points.

First, there is substantial empirical evidence supporting Lintner's (1956) partial adjustment model of divided signalling explanation. This approach has been central to the dividend debate and still remained valid, after all those years, since 1956 when the original findings were presented. Specifically, firms believe in the stability of dividends, concerning that the market reacts favourably to dividend increases and unfavourably to decreases. Hence, they tend to prevent making changes in dividend rates that may have to be reversed in the future, and they are reluctant to cut dividends, unless adverse circumstances are likely to persist. Accordingly, current earnings and lagged dividends are the most crucial determinants of the current dividend levels. However, there has been no consensus achieved on the argument that dividend change announcements do necessarily signal about the future earnings changes of the firms. There is no strong evidence that announcements of dividend increases/decreases and initiations/omissions characteristically trigger an impact on future share prices in the same direction.

Second, empirical studies related to agency problems in developed markets generally focus on the principal-agent conflict. In this respect, there is strong evidence in favour of the cost minimisation model, developed by Rozeff (1982). Similarly, there is evidence that dividends may play a role in controlling agency problems by facilitating primary capital market monitoring on firms' activities and performance, as proposed by Easterbrook (1984). There is also evidence that dividends can be used as substitutes with other non- dividend monitoring mechanisms, such as managerial ownership, leverage and growth. However, empirical evidence based on Jensen's (1986) free cash flow hypothesis is quite mixed. Since both agency cost of free cash flow and signalling hypothesis imply relatively similar effects on share prices, although many empirical studies showed support for the free cash flow hypothesis, they cannot completely rule out the cash flow signalling hypothesis.

Third, a number of cross-country studies show that concentrated ownership structures by large controlling shareholders are the dominant form of organisational form in most developing countries. Hence, agency cost theory of dividends needs to be uniquely investigated in developing markets, and, more importantly, the ownership structure of the firms in these markets should specifically be taken into account while identifying the proxies for agency cost variables. Indeed, the salient agency problem is the expropriation of the wealth of minority owners by the controlling shareholders (in other words, the principal- principal conflict) in these economies. Fourth, there is not enough evidence that dividends are used to expropriate wealth from bondholders to shareholders.

Finally, some researchers find that the existence of the clientele effect determines the ex-dividend day share prices, as the ex-dividend price drop should reflect the differential taxation between dividends and capital gains of the marginal investors. Alternatively, the short-term trading hypothesis challenges this point, arguing that in the presence of short- term traders, such as tax-neutral dealers and corporate traders, the marginal tax rates of the investors cannot be inferred by observing the ex-day price drop. It is because short-term traders, who are seeking for arbitrage profits, will dominate the price setting on the ex-days; hence, eliminating the tax effect. In fact, empirical evidence involving the tax-related theories is completely inconclusive.

5. Conclusions

Although Miller and Modigliani's (1961) dividend irrelevance theory is logical and consistent under perfect capital market assumptions, once this idealised world is left and we return to the real markets, various imperfections exist and this theory becomes highly debatable. Researchers, indeed, propose a range of leading dividend theories (e.g., the signalling, agency cost and tax preference theories) dealing with the presence of the various market frictions. However, none of these theories explain the dividend puzzle single-handedly.

Empirical research regarding dividend policy is extensive. Especially, studies conducted in developed markets, where the major theories are originally formulated, have provided voluminous evidence on the divided debate. Although some explanations (e.g., the Lintner or Rozeff models) have been strongly supported by many scholars, no general consensus has yet been reached despite countless research. Consequently, our paper shows that the actual motivation for paying dividends is still unsolved and remains as a puzzle. Additionally, empirical evidence related to developing (emerging) markets is relatively limited compared to the developed markets. With the growing importance in terms of global equity investments, developing countries have recently started attracting international investors at a considerable level. Along with the fact that emerging markets generally differ from developed markets in many aspects (such as, ownership structures, poorer laws and regulations, weaker corporate governance, and political, social and financial stability) and the debate on dividend policy is still inconclusive, there is no doubt that emerging markets add more to the dividend puzzle. In fact, a growing number of studies have started to examine the relationship between ownership structure (e.g., families, institutional investors and the state), corporate governance (e.g., board size, board independence and CEO duality) and dividend policy in the context of emerging markets. For example, various cross-country studies, such as Mitton (2004) – 19 developing countries from Latin America and Asia to Europe, Abor and Fiador (2013) – four emerging markets in Sub-Saharan Africa, and Mehdi et al. (2017) – 362 firms from East Asia and Gulf Cooperation Council countries, and single-country studies, such as Abdelsalam et al. (2008) in Egypt, Bokpin (2011) in Ghana, Setiawan and Phua (2013) in Indonesia, Benjamin and Zain

(2015) in Malaysia and Al-Najjar and Kilincarslan (2016) in Turkey, have all documented the effect of ownership structure and/or corporate governance on dividend payment decisions.

Thus, we argue that dividend policy remains a continuing puzzle and subject to much criticism based on the various factors, including tackled imperfection, market conditions or the methodology adopted. It is also worth noting that some recent explanations of the dividend policy relate to the considerations such as the catering theory, firm life-cycle (maturity) and behavioural finance (e.g., investor preferences) but whether such explanations help in solving the puzzle or adding more complexity to the debate is a topic worth to investigate.

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Table 1. Summary of Empirical Studies of Signalling Theory

Panel A: Studies of the Partial Adjustment Model						
Author(s)	Model Examined	Country	Sample	Sample Period	Method(s)	Empirical Results
Darling (1957)	Modifications of the Lintner Model	U.S.	Ranged from 88 to 265 industrial firms	1921–1955	Multiple-regression	There is substantial empirical evidence supporting Lintner's partial adjustment model of signalling theory and reporting consistency of Lintner's results across different period of time and methods in developed markets.
Fama and Babiak (1968)		U.S.	392 industrial firms	1946–1964	OLS regression and simulations	
McDonald et al. (1975)		France	75 firms	1962–1968	OLS and 2SLS regressions	
Chateau (1979)		Canada	40 manufacturing firms	1947–1970	OLS, OLS_{H-L}, IV, QGLS and ALS regressions	
Dewenter and Warther (1998)		U.S. and Japan	313 U.S. and 180 Japanese firms	1983–1992	OLS and logit regressions, and Wilcoxon test	
Baker et al. (1985)	Survey-based research	U.S.	318 usable responses	1983	Postal survey	
Pruitt and Gitman (1991)		U.S.	114 usable responses	1988	Postal survey	
Baker et al. (2002)		U.S.	188 usable responses	1999	Postal survey	
Brav et al. (2005)		U.S.	384 usable responses and 23 interviews	2002	Postal survey and in-depth interview	
			Ranged from 89 to 244 firms	1950–2002	Multiple-regression	
Baker et al. (2006)		Norway	33 usable responses	2004	Postal survey	
Baker et al. (2008)		Canada	103 usable responses	2005	Postal survey	
Baker and Powell (2012)		Indonesia	52 usable responses	2009	Postal survey	There is evidence supporting the Lintner model in explaining dividend behaviour in different emerging markets in where they generally have higher adjustment factors; hence, lower smoothing and less stable dividend policies compared to developed countries.
Baker and Kapoor (2015)		India	42 usable responses	2013	Postal survey	
Baker et al. (2018)		Turkey	57 usable responses	2015	E-mail survey	
Mookerjee (1992)	Modifications of the Lintner model	India	Private sector firms	1950–1981	OLS regression	
Pandey (2001)		Malaysia	248 industrial firms	1993–2000	Pooled OLS and panel (fixed and random effects, and logit) regressions	
Al-Najjar (2009)		Jordan	86 non-financial firms	1994–2003	Pool and panel OLS, logit and tobit, and fixed and random effects regressions	
Chemmanur et al. (2010)		U.S. and Hong	618 U.S. and 156	1984–2002	Time series regression	

		Kong	Hong Kong firms			
Al-Najjar and Kilincarslan (2017)		Turkey	264 industrial firms	2003–2012	Pooled OLS and system GMM	
Adaoglu (2000)		Turkey	76 non-financial firms	1985–1997	Pool and panel OLS, logit and tobit, and fixed and random effects regressions	The Lintner model does not work very well for emerging market firms since current dividends are much less sensitive to past dividends in these markets.
Aivazian et al. (2003)		Eight emerging markets and U.S.	The largest firms from eight emerging markets and 100 U.S. firms	1980–1990	Pooled OLS	
Panel B: Studies of the Information Content of Dividends Hypothesis						
Author(s)	Type of Announcements	Country	Sample	Sample Period	Event Study Time Period† and Method	Empirical Results
Aharony and Swary (1980)	Dividend changes	U.S.	2,612 events from 149 firms	1963–1976	Days (−10 to +10), SMM	There are studies report evidence from both developed and emerging markets that indicates managers have prior inside information about their firm's future financial performance and thus they use cash dividend announcements (increases/decreases and/or initiations/omissions) to convey changes in their expectations about the firm.
Healy and Palepu (1988)	Dividend initiations and omissions	U.S.	131 initiating and 172 omitting firms	1969–1980	Days (−60 to + 20) and Years (−5 to +4), MAR, regression analysis	
Michaely et al. (1995)	Dividend initiations and omissions	U.S.	561 initiating and 887 omitting events	1964–1988	Days (−254 to +758), MAR	
Akhigbe and Madura (1996)	Dividend initiations and omissions	U.S.	128 initiating and 299 omitting events	1972–1990	Months (+1 to +36), BSAR	
Lipson et al. (1998)	Dividend initiations	U.S.	99 initiating and 99 non-initiating newly-listed, and 99 size-matched dividend paying firms	1980–1990	Days (−1 to +10) and Years (−1 to +2), MAR, RW, IGA and SGA	
Altiok-Yilmaz and Akben-Selcuk (2010)	Dividend changes	Turkey	184 events from 46 firms	2005–2008	Days (−360 to +1), SMM	
Dasilas and Leventis (2011)	Dividend changes	Greece	231 events	2000–2004	Days (−220 to +120), SMM	
Al-Yahyaee (2011)	Dividend changes	Oman	501 events	1997–2005	Days (−250 to +5),	

					SMM and MAR	
Jensen and Johnson (1995)	Dividend decreases and omissions	U.S.	268 events from 242 firms	1974–1989	Years (−3 to +2), Wilcoxon test	However, there are other studies conducted in different markets (both developed and emerging) provide evidence inconsistent with the information hypothesis of dividends, claiming that dividend policy change announcements do not necessarily signal about the future earnings changes of firms.
DeAngelo et al. (1996)	Dividend changes	U.S.	145 firms	1980–1987	Years (−10 to +3), RW and IGA	
Benartzi et al. (1997)	Dividend changes	U.S.	7,186 events from 1,025 firms	1979–1991	Years (−5 to +3), Categorical analysis and MAR	
Fairchild et al. (2014)	Dividend changes	Thailand	618 events from 287 firms	1996–2009	Years (−1 to +2), Benchmark and regression analyses	
Liu and Chen (2015)	Dividend changes	U.S.	15,321 events	1979–2011	Years (−2 to +2), OLS and 2SLS	

Notes: OLS: Ordinary Least Squares; 2SLS: Two-stage Least Squares, $OLS_{H\text{-}L}$: Ordinary Least Squares corrected Hildreth-Lu; IV: Instrumental Variable; QGLS: Quasi-generalised Least Squares; ALS: Augmented Least Squares; SMM: Simple Market Model; MAR: Market Adjusted Returns; BSAR: Beta and Size Adjusted Returns; RW: Random-walk Model; IGA: Income-growth-adjusted Model; SGA: Sales-growth-adjusted Model; GMM: Generalised Method of Moments. †Event Study Time Period compounds pre-event, event date and post-event time periods.

Table 2. Summary of Empirical Studies of Agency Cost Theory

Panel A: Studies of the Principal-Agent Conflict						
Author(s)	Argument	Country	Sample	Sample Period	Method(s)	Empirical Results
Crutchley and Hansen (1989)	Monitoring role of dividends	U.S.	603 industrial firms	1981–1985	OLS cross-sectional regression	There is strong evidence that dividend policy may play a role in controlling the conflicts of interest between principals and agents by facilitating primary capital market monitoring on firms' activities and performance, as proposed by Easterbrook (1984). As well, there is evidence that dividends can be used as substitutes with other alternative control devices, such as insider ownership, leverage and growth.
Born and Rimbey (1993)		U.S.	490 firms	1962–1989	Event study and cross-sectional regression analyses	
Hansen et al. (1994)		U.S.	81 electric utilities in 1985 and 70 electric utilities in 1990	1981–1985 1986–1990	Comparison analysis and OLS cross-sectional regression	
Noronha et al. (1996)		U.S.	341 industrial firms	1986–1988	OLS and 3SLS regressions	
Lang and Litzenberger (1989)	Free cash flow hypothesis	U.S.	429 substantial dividend changes	1979–1984	Event study	There is evidence supporting Jensen's (1986) free cash hypothesis in order to explain dividend policy decisions. However, since both agency cost of free cash flow and signalling hypotheses imply relatively similar effects on share prices, studies cannot completely rule out the cash flow signalling hypothesis. Hence, empirical evidence on this area is quite mixed.
Agrawal and Jayaraman (1994)		U.S.	71 industry-sized matched pairs of all-equity and levered firms	1979–1983	Comparison analysis and OLS cross-sectional regression	
Johnson (1995)		U.S.	129 straight debt offerings	1977–1983	Event study, comparison analysis and WLS	
Lloyd et al. (1985)	Modifications of the cost minimisation model	U.S.	957 industrial firms	1984	OLS cross-sectional regression	There is strong evidence in favour of the cost minimisation model developed by Rozeff (1982), which combines transaction costs and agency costs to an optimal dividend
Schooley and Barney (1994)		U.S.	235 industrial firms	1980	OLS cross-sectional regression	

Moh'd et al. (1995)		U.S.	341 industrial firms	1972–1989	WLS	policy. Empirical research reports findings consistent with Rozeff's original findings and indicates a relationship between dividend policy and agency cost variables.
Farinha (2003)		U.K.	693 firms in 1991 and 609 firms in 1996.	1987–1991 1992–1996	OLS cross-sectional regression	
Panel B: Studies of the Principal-Principal conflict						
Author(s)	Argument	Country	Sample	Sample Period	Method(s)	Empirical Results
La Porta et al. (2000)	Outcome and substitute models	33 different countries	4,103 firms	1989–1994	Comparison analysis and cross-sectional regression with country random effects	There is increasing evidence that concentrated ownership by large controlling shareholders (typically, families) is the dominant form of ownership structure in emerging markets, which indicates that the salient agency problem may therefore be expropriation of the wealth of minority owners by the controlling shareholders in these markets. Indeed, empirical research reveals that agency cost theory of dividends needs to be uniquely investigated in emerging markets and, more importantly, the ownership structure of the firms in these markets should specifically be taken into account while identifying the proxies for agency cost problems.
Faccio et al. (2001)	Ownership structure effect	Five West European and nine Asian countries	5,897 firms	1992–1996	Comparison analysis and OLS cross-sectional regression	
Manos (2002)	A modification of the cost minimisation model	India	661 non-financial firms	2001	OLS, tobit, and Heckman's two step regressions	
Chen et al. (2005)	Family ownership effect	Hong Kong	412 firms	1995–1998	Pooled OLS, industry-fixed and firm-fixed effects regressions	
Wei et al. (2011)	Family control effect	China	1,486 firms	2004–2008	Logit and tobit regressions	
Gonzalez et al. (2014)	Family involvement influence	Colombia	458 firms	1996–2006	Random effects probit and cross-sectional tobit regressions	
Al-Najjar and Kilincarslan (2016)	Ownership structure effect	Turkey	264 industrial firms	2003–2012	Pooled and random effects (panel) logit and tobit regressions	
Panel C: Studies of the Shareholder-Bondholder Conflict						
Author(s)	Argument	Country	Sample	Sample Period	Method(s)	Empirical Results
Woolridge (1983)		U.S.	367 unexpected dividend changes	1971–1977	Event study and CPRA	No evidence that firms use dividends to transfer wealth from bondholders to shareholders.
Jayaraman and Shastri		U.S.		1962–1982	Event study and cross-	

(1988)	Wealth transfer or information content		2,023 specially designated dividends		sectional regression	Hence, the information content hypothesis dominates the wealth transfer hypothesis.
Long et al. (1994)		U.S.	141 straight and 78 convertible bonds	1964–1977	Comparison analysis	
Tsai and Wu (2015)		U.S.	5,571 dividend announcements	2005–2012	Event study, comparison and regression analyses	Although it cannot rule out the information content hypothesis completely, there is still evidence of a tendency to redistribute wealth in favour of shareholders.
Dhillon and Johnson (1994)		U.S.	131 dividend changes	1970–1987	Event study and comparison analysis	
Mathur et al. (2013)		U.S.	6,682 firm-year observations	1970–2005	Regression analysis	

Notes: OLS: Ordinary Least Squares; 3SLS: Three-stage Least Squares; WLS: Weighted Least Squares; CPRA: Comparison Period Return Approach.

Table 3. Summary of Empirical Studies of Tax Effect

Panel A: Studies of the Relationship between Dividend Yields and Risk-Adjusted Returns						
Author(s)	Model Examined	Country	Sample	Sample Period	Method(s)	Empirical Results
Litzenberger and Ramaswamy (1979; 1982)	The CAPM and its variations	U.S.	New York Stock Exchange (NYSE) stocks	1936–1977	Cross-sectional (using OLS, GLS and MLE) regressions	Investors require higher pre-tax risk adjusted returns on stocks with higher dividend yields to compensate the tax disadvantages of these returns when dividends are taxed at higher rates than capital gains, consistent with the tax effect hypothesis.
Poterba and Summers (1984)		U.K.	3,500 British firms	1955–1981	GLS	
Black and Scholes (1974)		U.S.	25 investment portfolios from NYSE stocks	1936–1966	Cross-sectional and time-series regressions	There is no relationship between dividend yields and stock returns. Because, not all investors are taxed at the same rate and those investors will invest in companies with cash dividend policies suitable for their tax situation. Since clienteles exist for low and high dividend policies, companies cannot increase their values by reducing taxes through their dividend policies. Hence, the evidence shows no support for a tax effect but is consistent with the tax clientele hypothesis.
Miller and Scholes (1982)		U.S.	NYSE stocks	1940–1978	Cross-sectional and time-series regressions	
Blume (1980)		U.S.	NYSE stocks	1936–1976	Cross-sectional regression	There is evidence of a yield-tax effect but this is not entirely consistent with the tax effect hypothesis since non-tax factors exist for the yield effect. Hence, although taxes explain part of the positive relationship between yields and stock returns, the relation across stocks is far too complicated to be fully explained by tax effect.
Keim (1985)		U.S.	Ranged from 429 to 1,289 NYSE firms	1931–1978	Cross-sectional and time-series regressions	
Kalay and Michaely (2000)		U.S.	NYSE stocks	1936–1988	Cross-sectional (using OLS, GLS and MLE) and time-series regressions	
Park and Kim (2010)		Korea	Ranged from 457 to	2000–2008	Cross-sectional and	

			534 firms		time-series regressions	
Lemmon and Nguyen (2015)		Hong Kong	1,092 firms	1981–2010	Cross-sectional and time-series regressions	
Panel B: Studies of the Ex-Dividend Day Share Behaviour						
Author(s)	Parameter Examined	Country	Sample	Sample Period	Method(s)	Empirical Results
Elton and Gruber (1970)	Ex-dividend price drop compared to dividend per share	U.S.	4,148 observations	1966–1967	Event study and Spearman's rank test	There is evidence that taxes are important determinants of the firms' payout decisions, suggesting that taxation affects significantly ex-dividend day share price behaviour and shareholders in a higher tax brackets have a tax-induced preference for capital gains over dividend income, compared to those in lower tax brackets.
Kaplanis (1986)		U.K.	360 options on 14 different shares	1979–1984	Event study, OLS, GLS and MLE	
Lasfer (1995)		U.K.	10,123 observations	1985–1994	Event study, comparison analysis and regressions	
Bell and Jenkinson (2002)		U.K.	9,673 observations	1995–1999	Event study and OLS regression	
Milonas et al. (2006)		China	317 observations	1996–1998	Event study and comparison analysis	
Kalay (1982)		U.S.	2,540 observations	1966–1967	Event study and Spearman rank test	In the presence of short-term traders, the marginal tax rates of the shareholders cannot be inferred by observing ex-dividend day share price drops. Because, short-term traders such as tax-neutral dealers and corporate traders, who are seeking for arbitrage profits, dominate the price setting on the ex-days.
Michaely (1991)		U.S.	18,389 observations	1986–1989	Event study, OLS, GLS and Fisher sign test	
Koski and Scruggs (1998)	Trading volume around ex-days	U.S.	70 observations	1990–1991	Event study, comparison analysis and OLS regression	
Rantapuska (2008)		Finland	885 observations	1995–2002	Event study, probit, logit and Heckman's two-step regressions	All types of investors may take advantage of the differences in tax rates and engage in arbitrage opportunities around ex-days, which supports dynamic clientele hypothesis.
Tseng and Hu (2013)		Thailand	559 observations	1996–2005	Event study, comparison analysis and OLS regression	

Notes: CAPM: Capital Asset Pricing Model; OLS: Ordinary Least Squares; GLS: Generalised Least Squares; MLE: Maximum Likelihood Estimator.

APPENDIX A: M&M's Proof of Dividend Irrelevancy

M&M (1961) illustrate their argument behind their theorem as below:

$$r = \frac{D_1 + (P_1 - P_0)}{P_0} \tag{1}$$

Where r is the rate of return; P_0 is the current market price of the share when the investor buys it and P_1 is the expected market price when the investor sells it; D_1 is the dividend per share paid over this period. Accordingly, the rate of return on the share equals the dividend income plus the capital gain of selling this share, all divided by the price of the share at the beginning of the period. Re-organising Equation (1), we can measure the current market price of the share as:

$$P_0 = \frac{D_1 + P}{(1 + r)} \tag{2}$$

Now, if we suppose that n is the number of shares outstanding at time zero, the current market value of the firm (MV_0) is:

$$MV_0 = nP_0 = \frac{nD_1 + nP_1}{(1 + r)} \tag{3}$$

In order to prove that dividends are irrelevant under the assumptions of perfect capital market, M&M employ the sources and uses of funds equation. The firm's sources of funds are the cash flows from operations (CF_1) and the new equity financing during any given period (mP_1), where m is the number of new shares issued at time one and sold at the ex-dividend closing price P_1. The uses of funds are the dividend payments (nD_1) and investment opportunities (I_1) taken in the same time interval. As the sources must equal the uses of the funds, therefore:

$$CF_1 + mP_1 = nD_1 + I_1 \tag{4}$$

Once Equation (4) is re-arranged:

$$nD_1 = CF_1 + mP_1 - I_1 \tag{5}$$

Re-placing Equation (5) into Equation (3) for nD_1 will give us:

$$MV_0 = \frac{CF_1 + mP_1 - I_1 + nP_1}{(1 + r)} = \frac{CF_1 - I_1 + (n+m)P_1}{(1 + r)} \tag{6}$$

Knowing that $(n+m)P_1 = MV_1$, thus;

$$MV_0 = \frac{CF_1 - I_1 + MV_1}{(1 + r)} \tag{7}$$

Since dividend payments do not appear in Equation (7) and given that operating cash flows (CF_1), investments (I_1) and rate of return (r) are not functions of dividend policy, the market value of the firm is not dependent of its current dividend policy. Therefore, the analysis suggests that the firm's investment policy is the key determinant of its value and dividend policy is residual. Furthermore, the analysis can be carried over to more periods and the results will remain the same; that is the value of the firm is not affected by dividend policy. Also, the analysis above completely based on 100% equity financing. It can be extended to contain debt financing. However, the inclusion of debt financing does not affect the results. Similar to the equity-financed dividends, no additional value is created by debt-financed dividends under the assumptions of perfect capital market (Miller and Modigliani, 1961).