DIVIDEND POLICY: A LONG-TERM INVESTIGATION

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en die voor passie gaat.
In het donker kan ik jou niet zien,
maar ik weet dat jij daar staat.
(The scene, Iedereen is van de wereld)

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Failure is simply the opportunity to begin again,
this time more intelligently.
(Henry Ford)

Leentje Moortgat

Antwerpen, 20 mei 2019

CONTENT

Introduction

The field of corporate finance is rather broad and concerns all financial decisions that are made in companies. Basically, there are three important corporate finance decisions: the investment decision (i.e. *What assets should the corporation invest in?*), the financing decision (i.e. *How will we fund these assets? What is the optimal capital structure?*) and the payout decision (i.e. *Should we pay dividends or repurchase shares? How much should we pay?*) (Berk and DeMarzo, 2011). In this dissertation, I focus on the dividend decision[1] of firms listed on the Brussels Stock Exchange (BSE) between 1824 and 2012.

Dividend payments can be defined as *"Payments made at the discretion of the corporation to its equity holders"* (Berk and DeMarzo, 2011, p. G-6). As such, for shareholders of the company, dividends form the income of the invested capital. In contrast to interest payments on bonds, which are specified in a contract between the bondholder and the corporation, and which are as such paid mandatory, paying dividends is not an obligation (Berk and DeMarzo, 2011).

When setting the dividend policy of the firm, the first question that needs to be answered is: "*Will we pay a dividend?"*. If the answer to this question is yes, a second question pops up, namely: *"How much dividends will we pay?"*. In present-day Belgium, firms generally pay a dividend once a year, and as such, these decisions are taken on an annual basis. However, this dividend policy is not set each year de novo and the lagged dividend decision is thus generally the starting point to make a new decision. The finding that managers are reluctant to abruptly change their dividend is documented for the first time by Linter (1956) and today's managers still confirm their aversion against abrupt dividend changes (Brav et al., 2005). More specifically, managers will only increase their dividends if they expect that this higher dividend is sustainable in the future, and mangers will, by all means[2], avoid dividend cuts. In the remaining of this section, we will compare the dividend policy of Belgian firms to dividend policy in other countries. We focus on the propensity to pay, the dividend initiation rate and the dividend omission rate.

From the perspective of investors, dividends are important, as they form a large part of the total stock return, especially in the long-run. For Belgian firms listed on the Brussels Stock Exchange (BSE), Annaert et al. (2015) show that in the long-run, dividends generate a positive return, whereas the return from capital gain is insufficient to compensate for inflation. During their entire sample period (1838−2010), the mean stock

[1] As share repurchases are rare in Belgium, I will only discuss share repurchases to a limited extent.
[2] Recent survey evidence indicates that managers would rather forgo positive NPV projects than cutting their dividend (Brav et al., 2005).

return was equal to 3.16. The mean capital gain was negative (-0.70), whereas the mean dividend yield was largely positive (3.89). Clearly, dividends form the largest part of the income from investing in stocks. Therefore, studying dividends is of utmost importance.

In the remaining of this chapter, I first discuss the importance of economic history research (Section 1). Section 2 offers a comparative perspective of dividend policy in different countries in different periods of time. Section 3 gives an overview of the different reasons why firms pay dividends and highlight open questions in the dividend literature. Next, in Section 4, I discuss the three empirical studies of this PhD dissertation. Section 5 describes the major limitations of my studies.

1. Why is economic history important?

In this PhD dissertation, I focus on dividend policy of Belgian listed firms using data of almost two centuries. Going back in time to investigate dividends is important for at least two reasons. First, studying economic history in general is important as knowing where we came from is necessary to understand where we currently are (Blum and Colvin, 2018). Second, a long-run analysis of dividend policy is useful as it allows us to better understand the link between dividends and the environment in which firms operate.

A first question to tackle is thus: Where do dividends come from? The history of dividends goes back to the early 17th century, the era during which the first joint stock companies appeared. The Dutch East Indian Company and the English East Indian Company, two companies which played an important role in fostering international trade, are definitely among the most famous joint stock companies that operated in that time. Back then, corporate finance was totally different from nowadays. Originally, these joint stock companies were short-term oriented. Capital was raised separately for each voyage. On the voyage completion, proceeds of the voyage were distributed towards shareholders and the voyage was liquidated (e.g. Baskin and Miranti, 1997; Gelderblom et al., 2013). These "*divisions*" towards shareholders were actually the very first dividends that were ever distributed. At that time, no distinction was made between income of capital (i.e. dividends) or the return of capital (i.e. capital gain) as they were both the result of the liquidation of the voyage (Baskin and Miranti, 1997). The payment was usually not made in cash, but in spices (e.g. clove) (Van Dillen, 1970). Over time, the self-liquidating voyages were replaced by a more permanent capital structure. The Dutch East Indian Company made this transformation in 1612, whereas the English East Indian Company replaced its self-liquidating voyages by a permanent capital structure only in 1659 (Neal, 1990). From then on, the *divisions* were only paid from the net earned income (Baskin and Miranti, 1997). However, as companies today still have a long-term orientation, an important question is why firms in the 21st century still pay dividends. This is today one of the biggest enigma's in the corporate finance literature.

Our long-run analysis offers a unique perspective to investigate dividends. The institutional environment in which firms operate is generally believed to affect the dividend policy of firms (e.g. La Porta et al., 2000). Over our sample period, the Belgian institutional settings changed drastically. In the beginning of our sample period, investor protection was weak. The Commercial Code as introduced by Napoleon in 1807 was still in force at the moment of Belgium's independence. In order to incorporate a limited liability company, government approval was necessary. Once the company was incorporated, legislation of these companies was limited. For instance, it was not required to publish financial statements, only large shareholders had access to the annual general meeting and there was no requirement to have a board of directors (Demeur, 1859; Théate, 1905). On top of this complete absence of legally enforced investor protection, dividends were not taxed. In these institutional settings, dividends provide important information to outside investors (Baskin and Miranti, 1997). Over time, the institutional environment changed drastically. For instance, the requirements to incorporate new companies changes (1873) (Théate, 1905), legislation on the access to the general meeting and voting rules are adapted (1873, 1934) (Willems, 2000), publication requirements changed several times (1873, 1913, 1975) ('t Kint, 1985; Théate, 1905; Wauwermans, 1914), an external audit of the financial statements was introduced (1953) (Centre d'étude des Sociétés, 1956), laws on insider trading and corporate takeovers were developed (1989) (Geens, 1990; Hendrickx and Van gulck, 1991) and a corporate governance code was established (2004) (Commissie Corporate Governance, 2004). Apart from these changes in investor protection legislation, dividend tax laws also changed several times with major changes to the Belgian taxation system in 1920 (Gilson, 1921) and 1962 (Henry, 1967). Given the general believe that dividend policy is affected by the environment in which firms operate, a long run analysis enhances our understanding of dividends.

Not only are we able to investigate how dividend policy is affected by changes in the level of investor protection or taxation, the economic environment in which firms operate also changes over time. Over our long sample period, the Belgian economy was hit by several large crises (e.g. the Great Depression (1929), the oil crises (1970s), and more recently, the Great Recession (2007)). Additionally, Belgium was also involved in two World Wars. As such, we are also able to explore how the dividend behavior of firms is related to the economic environment in which firms operate. Moreover, over time, the industry composition of firms listed on the BSE changes, which offers a unique perspective to investigate the link between industry development and the decision to pay dividends.

Belgium provides a unique laboratory to investigate dividend policy from a long-term perspective. First of all, to the best of my knowledge, Belgium is the only country in the world for which such detailed high-quality dividend data exists for this period of time. These data are highly reliable as they are hand-collected

and cross-checked using different sources (Annaert et al., 2012). Second, in the pre-World War I era, Belgium was a country with a flourishing economy. It was the first country on the European continent to industrialize, and Belgium had a very active stock market in that era. At the end of the 19th century, the BSE was one of the largest stock exchanges in the world (Dimson et al., 2015). Moreover, the BSE was very diversified already in the period before World War I. Third, given the huge changes in the environment in which firms operate (e.g. changes in the level of investor protection, changes in the taxation system, several periods of economic crisis and economic expansion, changing industry composition over time), our research enables us to better understand how the dividend behavior of firms is related to the environment in which firms operate.

2. Dividend policy: a comparative perspective

This PhD dissertation focusses on dividend policy of firms listed at the BSE. At the start of this dissertation, it is interesting to compare dividend policy in our sample to dividend policy in other countries.

Fama and French (2001) document the evolution of the propensity to pay in the US between 1926 and 1999. In their sample period, the propensity to pay declines tremendously. In the period 1926−1962, the propensity to pay is as high as 75%, whereas in the period between 1963 and 1999, the propensity to pay is barely equal to 48%. In Belgium, however, the evolution of the propensity to pay is overall rather stable. Over our entire sample period (1838−2012), the propensity to pay is approximately equal to 60%. In the first half of the Fama−French period (1926 – 1962), the average propensity to pay in our sample is equal to 57%, whereas in the period 1963−1999, the propensity to pay is on average equal to 66%. As such, although the propensity to pay in US firms has decreased over the course of the 20th century, this is not the case in Belgium. Von Eije and Megginson (2008) document the evolution of the propensity to pay among European countries (Belgium included) between 1989 and 2005. In their sample period, the overall propensity to pay is equal to 65%. This is very comparable to Belgium, as the average propensity to pay of Belgian listed firms in this period is equal to 69%. As such, while the propensity to pay in Belgium is far higher than in the US in the last decades of the 20th century, it is very comparable to other European counterparts in the most recent decades.

Turner et al. (2013) investigate changes in dividend policy in the UK in the period 1825–1870. In their sample period, on average 4.62% of all firms start paying a dividend and on average 1.24% of all firms omit the dividend payment. In Belgium, for the period 1838−1870, we find that in our sample on average 15.34% of the non-paying firms start paying a dividend, whereas on average 6.04% of the dividend paying companies omit the dividend payment. This indicates that, in the earliest decades of our sample period,

dividends are less sticky in Belgium than in the UK. Ferris et al. (2006) show that in the UK in the period 1988−2002, on average 13.30% of the non-payers starts paying a dividend in a given year, while among all payers, 86.30% of all firms continue with their dividend payment. In Belgium, in the same period, we find an initiation rate of on average 26.06% and a continuation rate of 91.90%. This indicates that Belgian firms are more likely to initiate a dividend payment, and once they pay, they are also more likely to continue their dividend payment. The high continuation rate (or alternatively, the low omission rate) in Belgium both in historical capital markets as today, is an indication that the dividend payment is rather sticky.

As dividend policy differs across countries and over time, an important question is why firms pay dividends. In the next section, the major dividend theories are introduced.

3. Dividend theories

3.1 What do we know about dividends?

In a perfect Miller−Modigliani (1961) world, the value of the company is unaffected by its dividend policy. However, once dividends are taxed more heavily than capital gains, the optimal strategy is to pay no dividends (Brennan, 1970; Farrar and Selwyn, 1967). But still, dividends do exist. As such, an important and interesting question is: Why?

Information asymmetry is a first reason why firms pay dividends. Managers (insiders) typically have more information about the firm's future prospects than shareholders (outsiders). The signaling theory of dividends argues that insiders use dividends to give a signal about these future prospects (Bhattacharya, 1979; John and Williams, 1985; Miller and Rock, 1985). The value of the signal will be higher for more opaque firms compared to transparent firms. Therefore, firms with more information asymmetry are more likely to pay dividends. Several studies support the predictions of the signaling theory. For instance, some studies investigate the market reaction to dividend announcement and find the markets reacts positively to a dividend initiation/increase, whereas the market reaction is negative after an announcement of a dividend cut or dividend omission (Charest, 1978; Healy and Palepu, 1988; Michaely et al., 1995; Pettit, 1972). Additionally, dividend increases are found to be positively related to future earnings (Nissim and Ziv, 2001). Evidence on dividend policy in historical capital markets also supports the signaling theory of dividends (Braggion and Moore, 2011; Turner et al., 2013). However, other studies find that firms with more information asymmetry are less likely to pay dividends (e.g. Khang and King, 2006; Li and Zhao, 2008), which is opposite to the predictions of the signaling theory.

Agency conflicts (Easterbrook, 1984; Jensen, 1986) provide a second explanation of why firms pay dividends. Conflicts of interest originate in the divergence of interest between corporate insiders and outside shareholders. Having control over corporate assets, insiders can use these assets to extract private benefits of control at the expense of outside shareholders. Paying out dividends reduces the amount of free cash-flow under control of the corporate insiders, and should therefore decrease agency conflicts. Additionally, the degree of agency conflicts is likely to increase when a firm goes through its lifecycle. In large, cash-rich, profitable companies with few investment opportunities, the amount of free cash-flow available to the management is likely to be larger than in young firms with many growth opportunities. As such, according to the life-cycle considerations of dividends, more mature firms should be more likely to distribute dividends towards their shareholders (e.g. DeAngelo et al., 2006; Grullon et al., 2002). This is empirically supported by e.g. Fama and French (2001) and Denis and Osobov (2008) who show that large, profitable firms with few growth opportunities, which are typically mature firms, are found to be more likely to pay, whereas small firms with many growth opportunities are less inclined to pay dividends.

Off course, the level of agency conflicts and information asymmetry is not only driven by firm characteristics. This is also dependent on the environment in which firms operate. If investors are well-protected, problems of asymmetric information and agency conflicts are expected to be weaker compared to when investors are ill-protected. Over our sample period, the legal level of investor protection increases strongly. For instance, in historical capital markets, dividends are generally the only piece of reliable information (e.g. Baskin and Miranti, 1997). In Belgium, companies are only obliged to publish their financial statements as of 1873 (Théate, 1905) and only in 1913, the law provides limited guidance on the content of the balance sheet (Wauwermans, 1914). As such, in these historical settings, the signaling role of dividends is likely to be very important. Similarly, the monitoring role of dividends is likely to be more prevalent in the earliest part of our sample period. In Belgium, small shareholders have no access to the general meeting before 1873 and are thus easily expropriated. As such, these examples demonstrate that the environment in which firms operate is also likely to determine the dividend policy of a company.

While often not taken into account in research on the reasons why firms pay dividends, the liquidity of a company's stock is also likely to affect the dividend decision of the company. In their irrelevance theorem, Miller and Modigliani (1961) argue that if investors belief they received too few dividends, they can always create a home-made dividend by selling off a part of their shares. However, if liquidity is poor, creating a home-made dividend is expensive. Therefore, a low liquidity of a company's stock should increase the firm's likelihood to pay dividends. While Banerjee et al. (2007) find evidence in line with this proposition, Jiang et al. (2017) document a positive relationship between the stock's liquidity and the likelihood to pay.

Taxation affects dividend policy in multiple ways. Firms change dividend policy in response to changing taxation regulation (e.g. Alstadsaeter et al., 2013; Hanlon and Hoopes, 2014), and they substitute share repurchases for dividend payments when the tax treatment of share repurchases is more beneficial (e.g. Allen and Michaely, 2003; Fama and French, 2001). Additionally, there is also an interplay between dividend taxation and other reasons to pay dividends (like information asymmetry and agency conflicts). Alzahrani and Lasfer (2012) investigate the joint effect of investor protection and taxation and show that taxation affects dividend policy differently depending on a country's level of investor protection. Jacob and Michaely (2017) find that the impact of taxation is stronger in case agency conflicts are less severe. Finally, differences in taxation across different groups of investors give rise to dividend clienteles (e.g. Allen et al., 2000; Dahlquist et al., 2014).

As a last set of theories, dividend policy might also be driven by behavioral motives. In their prospect theory, Kahneman and Tversky (1979) argue that investors underweight random outcomes, while they overweight certain outcomes. Applied to the return investors have from investing in stocks, investors prefer dividends because these are certain while capital gains can easily vaporize (Shefrin and Statman, 1984). Fuller and Goldstein (2011) show that the excess return of dividend payers over non-payers (i.e. the dividend premium) is higher in times of economic downturn than in times of economic expansion. This is consistent with prospect theory as in times of economic downturn the uncertainty surrounding capital gains increases. However, Turner et al. (2013) do not find evidence that the dividend premium depends on the economic outlook. Another behavioral theory of dividends is the catering theory (Baker and Wurgler, 2004a). According to this theory, managers set their dividend policy in response to investor's demand for dividends. When investor's appetite for dividends is large, managers are more inclined to pay dividends compared to in times when investors demand for dividends is low. Also for this theory, empirical evidence is mixed (e.g. Baker and Wurgler, 2004b; Ferris et al., 2009; Hoberg and Prabhala, 2009; Li and Lie, 2006).

3.2 What do we not know about dividends?

Although there is already plenty of evidence on the dividend policy of firms, some issues are still unresolved. In this section, I will briefly touch upon the gaps in the literature that are addressed in this dissertation.

First, although cross-country evidence indicates that the legal level of investor protection is an important determinant of dividend policy (e.g. Ferris et al., 2009; La Porta et al., 2000; Sawicki, 2009), a limitation of this cross-country research is that the legal level of investor protection is fixed during the sample period. As such, long-term analysis is required to better understand the interplay between the institutional environment and corporate dividend policy. Bank et al. (2009) offer such a long-term analysis by

investigating dividends in the UK between 1949 and 2002. Although they consider changes in the political environment, in the taxation system and in the level of investor protection, they only focus on the effect of these changes on the total amount of dividend paid by all firms in the economy. As such, this study limits itself to the effect of changes in the environment on the decision how much to pay. Although the first decision firms take when setting their dividend policy is the decision to pay or not, evidence on how multiple changes in the institutional environment affect this decision is lacking. We address this issue in Chapter I of this dissertation.

The first chapter of this dissertation focusses thus on changes in the institutional environment and how these changes affect dividend policy. However, while this study merely describes the evolution in dividend policy, it fails to address the question whether the motives to pay dividends also change if the institutional environment changes. Put differently, the result of the dividend decision might be the same today as in historical capital markets, but firms might pay dividends for different reasons. Additionally, it is an open question whether the reasons why firms pay dividends differ depending on the state of the economy or on the maturity of the industry. It is, however, not unlikely that this is the case. Consider for instance the industry maturity: in young industries, there are plenty of investment opportunities and information asymmetry is typically large, whereas in mature industries, investment opportunities vanish and the profitability is generally higher. As such, in young industries, the signaling role of dividends is likely to be important whereas in mature industries, life-cycle arguments to pay dividends are strong. There is however very little evidence on the relationship between the environment in which firms operate and the reasons why firms pay dividends. A long-term analysis is particularly suited to investigate this issue. This is the subject of Chapter II of this dissertation.

As discussed above, there are plenty of theories on the reasons why firms pay dividends. The second chapter of this dissertation also contributes to this literature on the determinants of dividend policy. However, the empirical evidence is still inconclusive. Or, as Black (1976) puts it *"The harder we look at the dividend picture, the more it seems like a puzzle, with pieces that just don't fit together"* (Black, 1976, p. 5). Given that the dividend puzzle is still not completely resolved after decades of research, it is necessary to ask the question whether the traditional dividend theories overlook something. This is the question we explore in the third chapter of the dissertation.

In the next section, I will discuss the three empirical studies of this PhD research.

4. Empirical studies

4.1 Study I: Investor protection, taxation and dividend policy: Long-run evidence, 1838−2012

In the first empirical study of this PhD dissertation, we answer the question how changes in the institutional environment affect dividend policy, using 175 years of data from Belgian firms listed on the BSE.

It is generally believed that dividend policy is affected by the environment in which firms operate (e.g. La Porta et al., 2000). The commercial code affects the legal level of investor protection, which in its turn affects the importance of information asymmetry and agency conflicts, which are found to be important determinants of dividend policy (e.g. DeAngelo et al., 2006; Floyd et al., 2015; Hail et al., 2014; La Porta et al., 2000; Lang and Litzenberger, 1989; Nissim and Ziv, 2001). Additionally, taxation legislation affect the dividend tax penalty, which results from the differential taxation rate between capital gains and dividends (e.g. Brennan, 1970). Over time, the environment in which firms operate changes drastically. As such, this paper investigates whether these changing environment affect dividend policy of listed firms.

We start our analysis with investigating how dividend policy evolves over time. After describing the evolution of these different dividend measures, we run a structural break analysis which allows us to identify structural changes in the dividend policy of Belgian listed firms. We continue our analysis with time-series regression and panel regressions to estimate the impact of different changes in the commercial and taxation code on the dividend policy of Belgian listed firms.

Surprisingly, we find dividend policy to be very stable over our sample period. The structural break analysis indicates three breaks in dividend policy. The first two breaks are situated at the start of World War I and at the end of World War II, whereas the last break is situated in the mid-1980s. We show that the breaks around the outbreak of World War I and the end of World War II are completely driven by the World Wars. The third break in dividend policy, i.e. the one in the mid-1980s, is found to be driven by the changing composition of firms listed on the BSE. Also in time-series regressions and panel-regressions, we find no relationship between changes in commercial legislation and the changes in the tax law on the one hand and corporate dividend policy on the other hand. As dividend taxation is introduced at the end of World War I, we further investigate whether the effect we document is really a war-effect rather than a tax-effect. Based on newspapers published around the time of the introduction of the new taxation system in 1920, we show that the dividend tax turned out to be lower than expected. Additionally, we also find that dividends are not shifted from one year to another to avoid the detrimental tax treatment. As such, we conclude that the wars really had a strong negative impact on dividend policy, whereas commercial legislation and taxation legislation did not have an important impact on dividend policy in our sample.

This raises the question why dividends are so stable over such a long period of time. We offer three potential explanations. First of all, in the 19th and early 20th century, the investor public is limited to the wealthiest families. As such, social control might ensure that managers behave themselves and that shareholders are not easily expropriated, despite the limited level of legal investor protection. Second, similar as in the UK (Acheson et al., 2016), we find that companies voluntarily adopt investor protection in their articles of incorporation. This might indicate that in many cases, investor protection is better than legally required, which as such, decreases the need for dividend payments. Finally, although the level of investor protection changed over time, it might also be that the perception of what good investor protection is, also changed over time. For instance, compared to the British investors, Belgian investors are ill-protected as well in historical capital markets as in contemporary capital markets (e.g. La Porta et al., 2000; Théate, 1905). As such, Belgian investors today might still consider themselves as ill-protected and thus the dividend payment today might be equally important as the dividend payment in the past.

4.2 Study II: Why do firms pay dividends? 175 years of evidence

In the second empirical study, we investigate the determinants of dividend policy in Belgium, using a sample of 175 years. This long-term perspective allows us to investigate whether the reasons to pay dividends depend on (1) the institutional settings, (2) the state of the economy and (3) the maturity of the industry in which the firm is active. It is likely that firms today pay dividends for different reasons than firms in earlier periods. For instance, in historical capital markets, information available to outside investors is generally limited. As such, dividends were often the only source of reliable information to investors. In this environment, the signaling role of dividends is likely to be very important (Baskin and Miranti, 1997). However, investors today have access to plenty of reliable information, and as such, the signaling motive should become less relevant over time. Indeed, studies on historical capital markets generally find evidence in line with the signaling role of dividends (e.g. Braggion and Moore, 2011; Turner et al., 2013), whereas studies using contemporary data often find that firms pay dividends because of agency conflicts and life-cycle considerations (e.g. DeAngelo et al., 2006; Denis and Osobov, 2008; Fama and French, 2001; von Eije and Megginson, 2008). Similarly, the motives to pay dividends might depend on the economic settings. As the costs and probability of financial distress increase during times of economic downturn, this increases the signaling value of dividends. As such, the signaling role of dividends is likely stronger in times of economic recession compared to in times of economic prosperity. Likewise, the industry maturity can also affect the reasons why firms pay dividends. Investment opportunities and information asymmetry are partly industry-specific (e.g. Baker, 1988; Dempsey et al., 1993; Leary and Michaely, 2011; Michel, 1979), and varies over the life-cycle of the industry. In young industries, investment opportunities are abundant and information asymmetry is large. As such, the signaling role of dividends is important. In mature industries,

investment opportunities vanish. Life-cycle considerations are then probably the main driver of dividend policy.

Our results reveal common determinants of dividend policy in different institutional settings, during different states of the economy and at different phases in the industry life-cycle. Larger firms, firms with a lower level of idiosyncratic risk, firms with a higher share denomination and more liquid firms are more likely to pay dividends. Additionally, firms with a lower level of idiosyncratic risk are more likely to smooth their dividends.

Overall, these results cast doubt about signaling as a first-order determinant of dividends. Firms with more idiosyncratic risk are typically more opaque and therefore, these firms should be more likely to pay and more likely to smooth their dividends. However, we find the opposite to be true. Additionally, larger firms, which typically face less problems of asymmetric information, are more likely to pay dividends. This raises further doubt about signaling as a first-order determinant of dividend policy and indicates that life-cycle considerations are likely to be an important driver of the decision to pay dividends. In an additional analysis, we show that the majority of dividends is paid by a minority of large firms. This is again evidence against signaling as a first-order determinant as the largest, well-known firms typically do not pay dividends for signaling motives. However, the evidence of dividend concentration is again in line with life-cycle considerations as these large dividend payers are generally mature firms. Further, we do not find evidence in line with the home-made dividend proposition, the catering theory or prospect theory of dividends.

4.3 Study III: Persistence of dividend policy: Long-run evidence

In the third study of this PhD dissertation, we start from a finding of the capital structure literature. Recently, it is argued that the capital structure of firms is largely driven by an unobserved component that is very stable over long periods of time. (e.g. Hanousek and Shamshur, 2011; Hanssens et al., 2016; Lemmon et al., 2008). For dividend policy, there is substantial evidence on a short-term stickiness (e.g. Brav et al., 2005; Lintner, 1956). Given that the capital structure of the firm and the payout decision are inseparable and given this short-term stickiness, a logical question is whether dividend policy is also driven by a stable component in the long-run. However, if companies aim for a stable capital structure, changes in the company's resources imply, ceteris paribus, a flexible payout policy. In this chapter, we investigate whether the dividend policy at the moment of the firm's first listing has a long-lasting impact on future dividend policies, using data of Belgian listed firms as of 1824.

From a theoretical perspective, it is unclear how dividend policy should evolve over the life of a firm. On the one hand, based on life-cycle considerations (e.g. DeAngelo et al., 2006; Grullon et al., 2002), dividend policy should change throughout the life of a firm. Young, small firms that face many growth opportunities, are less likely to pay dividends. Once firms mature, their growth opportunities decline and the firm becomes more profitable. As more mature firms should be more likely to pay, this suggests that the dividend policy at the moment of the firm's first listing has no long-lasting impact on future dividend policies. On the other hand, dividends are found to be conservative, and managers look at the dividend decision of the previous year when deciding about the current dividend decision (e.g. Brav et al., 2005; Lintner, 1956). This conservativeness indicates that the initial dividend policy is likely to have a long-lasting impact on future dividend policies. This argument is consistent with imprinting theory (Marquis and Tilcsik, 2013; Stinchcombe, 1965), which suggests that *"during a brief period of susceptibility, a focal entity develops characteristics that reflect prominent features in the environment, and these characteristics continue to persist despite significant environmental changes in subsequent periods"* (Marquis and Tilcsik, 2013, p. 199).

Our results show that the initial dividend policy has a long-lasting impact on future dividend policies. Firms that initially pay a dividend are found to be more likely to pay in the future. At the same time, firms that have a high level of dividends per share in their first listing year also have a higher dividend per share in the future. This is an important finding, as this indicates that dividends have a very persistent component, which previous research did not take into account. Our results also indicate that the impact of the initial dividend policy becomes weaker when a firm goes through its lifecycle. As such, managers stick to their first dividend decision and are at the same time open to adjust dividend policy to their changing growth prospects. In summary, consistent with imprinting theory, the initial dividend policy is found to be an important imprinted characteristic. However, the impact of this imprinted characteristic decreases over the company's life which highlights the importance of life-cycle arguments of dividends.

5. Limitations of this PhD research

Off course, this PhD dissertation has its limitations. First, as a measure of how much dividends firms pay, we stick to dividend yield (Study I) and dividends per share (Study III). Only for a subsample of firms we have earnings data for a limited number of years (Study II). Given the absence of accounting data for the majority of our sample, calculating the pay-out ratio as a measure for how much dividends firms actually pay is not feasible for most of the time. Additionally, as we do not have earnings data, we are also not able to investigate whether dividends predict future earnings over our entire sample, nor are we able to estimate the Lintner smoothing model (1956) for most of the time.

Second, dividend announcement dates are not available. As such, we are not able to investigate how shareholders react to dividend announcements. Additionally, we are also not able to investigate whether the shareholder reaction is stronger for dividend decreases than for dividend increases, as is suggested by recent survey evidence (Brav et al., 2005). Moreover, the absence of announcement dates also prevents us to investigate whether the signalling value of dividends changes over time.

Third, we do not have data on the ownership structure. First of all, this makes it difficult to measure agency conflicts between insiders and outsiders in a good way. Second, the absence of the ownership structure is also detrimental for a thorough analysis of the effect of taxation on the firm's dividend policy. As dividend taxes are in part of our sample period different for institutional investors and private investors, we do not know the final tax rate that actually applies and we are also not able to test for the existence of dividend clienteles.

Despite all these limitations, our research offers important new insights in the dividend policy of firms listed on the BSE. In summary, stability seems to be the common denominator of all chapters. Study I shows dividend policy is very stable over time. In Study II, we show the determinants of the decision to pay are stable over our sample period. Finally, Study III shows that dividend policy has a very stable component that persist over a company's life.

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Chapter I. Investor protection, taxation and dividend policy: Long-run evidence, 1838−2012*

ABSTRACT

We investigate whether investor protection and taxation legislation affect dividend policy, using a unique sample of all Belgian and colonial firms listed on the Brussels Stock Exchange between 1838 and 2012. Investor protection was very weak in Belgium before World War I, but gradually improved over time. Dividend taxation was introduced only in 1920. While it is generally believed that investor protection and taxation affect dividend policy, we find that dividend policy has been remarkably stable over time, even after controlling for firm characteristics. Changes in investor protection and taxation legislation seem to have had little impact on dividend policy.

Keywords: Dividend policy, Investor protection, Dividend taxes, Belgium, Long-run evidence

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1. Introduction

The legal environment in which firms operate is widely believed to significantly affect firm dividend policy. Corporate legislation affects the degree of investor protection, which in turn affects the severity of information asymmetries and agency conflicts. Empirical evidence shows that information asymmetries and agency conflicts are important determinants of dividend policy[1] (e.g. DeAngelo et al., 2006; Floyd et al., 2015; Hail et al., 2014; La Porta et al., 2000; Lang and Litzenberger, 1989, Nissim and Ziv, 2001). La Porta et al. (2000) (LLSV from now on) show that cross-country differences in the legal level of investor protection are able to explain variation in dividend policy over the world. LLSV (2000) focus on the agency view of dividends and highlight that the interplay between dividend policy and investor protection can go in two directions: either shareholders use their legal power to extract dividends in which case dividends are the result of good legal investor protection *(Outcome model)*, or dividends are a necessary tool used by insiders to establish a good reputation *(Substitute model)*. Evidence is found in favor of both views (e.g. Campbell and Turner, 2011; Jiraporn and Ning, 2006; John et al., 2015; LLSV, 2000; Sawicki, 2009). The outcome model and substitute model can also explain varying levels of information asymmetry problems. Financial reporting offers a means to reduce these problems. While Koo et al. (2017) find better reporting quality leads to higher dividend payments (in line with LLSV's Outcome model), Van Overfelt et al. (2010) show that dividends are a substitute for the lack of income statement transparency in pre-World War I Belgium. Taxation is another important part of the legal environment, which is found to influence corporate dividend polices in different ways. Firms change dividend policy in response to changing taxation regulation (e.g. Alstadsaeter et al., 2013; Hanlon and Hoopes, 2014), and they substitute stock repurchases for dividend payments when the tax treatment of stock repurchases is more beneficial (e.g. Allen and Michaely, 2003; Fama and French, 2001). Alzahrani and Lasfer (2012) investigate the joint effect of investor protection and taxation and show that taxation affects dividend policy differently depending on a country's level of investor protection.

A limitation of these studies is that they focus on relatively short time periods during which there were little or no changes in investor protection or taxation. Other studies investigate dividend policy in early capital markets, where investor protection was typically very weak and dividend taxation was largely absent, but they also do not consider the effect of legal changes over time (e.g. Braggion and Moore, 2011; Campbell and Turner, 2011; Turner et al., 2013). Cheffins (2006) overcomes the problem of the limited time-period by building the anti-director right index (ADRI) (LLSV, 2000) for the UK for the entire 20th century. He

[1] Dividend payments may reduce information asymmetries between firm insiders and outsiders by signaling the firm's future prospects (Bhattachary, 1979; Miller and Rock, 1985) and by reducing agency conflcits between managers and shareholders by limiting the amount of cash under management's control (Easterbrook, 1984; Jensen, 1986).

shows that the UK moves from a low investor protection country (ADRI lower or equal to three) to a high investor protection country (ADRI higher than three) in 1980. He argues that dividend policy is quite stable in Britain despite the improving investor protection mechanisms as other mechanisms (e.g. retaining the option to issue new shares or avoiding hostile takeover bids) forced firms to pay (high) dividends. However, he does not explicitly test whether the improving investor protection affects corporate dividend policy. Bank et al. (2009) do investigate how changes in the political environment, in the taxation system and in the level of investor protection affect dividend policy in Britain in the period between 1949 and 2002. However, they do only consider the effect of this changing environment on the aggregate amount of dividends paid in the economy. As such, Bank et al. (2009) merely focus on the dividend payers in the economy and the total amount of dividends paid by these firms. There is thus no long-run evidence on the effect of a changing environment on the decision to pay dividends, to initiate dividends or to omit dividends, which are important aspects of corporate dividend policy.

In this paper, we investigate different aspects of corporate dividend policy over a time-period of 175 years, which allows us to exploit differences in the legal framework over time. Using a unique, high-quality database of the Studiecentrum voor Onderneming en Beurs (SCOB) at the University of Antwerp, we collected data for 2,048 common stocks issued by 1,792 Belgian firms listed on the Brussels Stock Exchange (BSE) between 1838 and 2012, that is, virtually all Belgian and colonial firms with listed common stocks in this period. To formally test for changes in dividend policy, we first use structural break tests (Bai and Perron, 1998, 2003). This approach allows us to find multiple structural changes in the data at unknown points in time. Second, we use time-series analysis in which we control for changes in the legal environment. Third, we use panel regression analysis to take into account the effect of firm characteristics. Surprisingly, we find that dividend policy is fairly stable over time. Granted, both world wars have a huge impact on dividend policy, but dividend policies are remarkably similar, especially before World War I and after World War II. There were some changes in dividend policy in the 1980s, but these seem to have been driven by the changing nature of firms listed on the BSE, not by modification in taxation or corporate legislation.

Belgium is an interesting setting in which to investigate dividend policy over such a long period, as it was one of the leading economies in the world before World War I. It was the first country on the European continent to industrialize, and the BSE was the seventh largest stock exchange worldwide on the eve of the 20th century (Dimson et al., 2015). Over our sample period, the legal environment changed dramatically. Initially, investor protection was very weak, even by contemporary standards (Théate, 1905) and dividends were not taxed. In such an environment, problems of asymmetric information and agency conflicts are likely to be substantial, and dividends may have helped to decrease these problems. Over time, investor protection

gradually improved and dividend taxation was introduced after World War I (Gilson, 1921). We therefore expect that dividends decreased over time, especially after World War I.

Our contributions to the literature are twofold. First, we investigate dividend policy over a very long period of time within one country, which allows us to compare dividend policy in different legal regimes. Other historical studies consider only limited time-frames (e.g. Braggion and Moore, 2011; Cambell and Turner, 2011; Deloof et al., 2010; Turner et al., 2013; or focus on a single company (e.g. Foerster and Sapp, 2006; Van Lent and Sgourev, 2013). Additionally, existing studies (e.g. LLSV, 2000; Alzahrani and Lasfer, 2012) exploit differences in investor protection and taxation across countries, whereas we exploit differences in investor protection and taxation in one country over time. Although Bank et al. (2009) conduct a long-run analysis on the effect of changes in the environment on dividend policy, we extend their analysis by more than one century and we consider different aspects of the corporate dividend policy. Second, we extend the evidence that changes in investor protection and taxation have little effect on dividend policy. Although evidence was already available for the UK, we offer an explanations why this might be the case. We conjecture that dividends might be equally important in different legal regimes as the perception of what good investor protection is, might have changed over time.

This paper proceeds as follows. In Section 2, we describe the changing legal environment in Belgium. Section 3 focusses on the data and dividend measures. Section 4 describes the evolution of dividend policy. In Section 5, we formally test for changes in dividend policy, and Section 6 controls for firm characteristics. Section 7 further investigates the apparent irrelevance of dividend taxation and Section 8 discusses possible explanations for the stability of dividend policy over time. Section 9 concludes.

2. The changing legal environment in Belgium

2.1 Investor protection

Investor protection in Belgium was very weak before World War I. According to Théate (1905), investor protection in Belgium at this time was much worse than in other European countries. The Commercial Code as introduced by Napoleon in 1807 was still in force in 1838. This code imposed almost no regulation on limited liability companies: it required them to establish an annual inventory including information on their assets and liabilities, but this was not disclosed to outsiders. Large shareholders were informed about the company's performance only at the general meeting, whereas small shareholders and other outsiders were usually not informed at all. Incorporation of a limited liability company required government permission (Piret, 1946). Many limited liability companies were founded by universal banks, of which Société Générale was the most important (Chlepner, 1930).

Changes in corporate legislation gradually improved investor protection. Beginning in 1841, companies were required to prepare an annual balance sheet, which was mandatorily disclosed, but there was no regulation or control of its precise content. The general meeting, which was open only to shareholders owning at least five shares of 1,000 BEF[2], approved the balance sheet. Before 1841, companies often paid a 5% fixed rate (*intérêt*) on share capital to guarantee an income return at least equal to the return on government debt. On top of this fixed yearly income, a dividend was distributed. The *intérêt* on shares was abolished in 1841 and companies were allowed to distribute dividends only if these did not exceed the "real profit." However, there was no legal definition of "real profit" (De Clercq, 1992; Demeur, 1859). Investor protection was further improved over the course of the 19th century.

In 1873, the need for government permission to establish a limited liability company was abolished, balance sheets were required to be published annually, and supervising directors[3] were assumed to monitor the balance sheet. The general meeting, which had to approve the balance sheet, became open to all shareholders, and no shareholder was allowed to vote for more than 20% of the outstanding shares or for more than 40% of the shares represented at the general meeting (Guillery, 1886). However, this legislation was easily circumvented by the issuance of multiple voting shares (Willems, 2000). On top of these regulations, paying dividends in excess of "real" (still undefined) profits became punishable in 1873, and publishing a fraudulent balance sheet became punishable in 1881. However, there was still no regulation as to when a balance sheet was to be considered fraudulent (Guillery, 1886; Théate, 1905). Moreover, only 60% of all companies complied with these publication requirements in the period 1873−1913 (Frère, 1951). The layout of the balance sheet was legally specified in 1913 in a very rudimentary way. Assets had to be subdivided into fixed and current assets, and liabilities were subdivided into shareholder equity, debt to bondholders, guaranteed debts and unguaranteed debts (Wauwermans, 1914).

Investor protection was further enhanced during the Interbellum. After a major banking crisis in the early 1930s, universal banks were forced to split up into holding companies and commercial banks, and the use of multiple voting shares, which became very common in large listed firms after World War I, was forbidden. In 1935, the government set up the Banking Commission, which was responsible for oversight of securities issues and supervision of the Belgian banking sector (De Voghel, 1941).

Beginning in 1953, all listed companies had to be audited by one or more members of the newly founded Institute for Auditors. This guaranteed the effectiveness and reliability of the monitoring of financial

[2] Daily average income of a male adult (older than 16) worker was less than 5 BEF in the 1840s (Neirynck, 1944).
[3] Beginning in 1873, companies were obliged to have a board of directors with at least three executive directors and one supervising director (Théate, 1905).

statements (Centre d'étude des Sociétés, 1956). In 1975, the structure of the balance sheet was further specified to increase financial transparency (Van Damme, 1983). In 1985, the legislature finally legally defined the profits distributable as dividends (Tas, 2003). Insider trading was banned by law only in 1989. Until then, it was assumed that "moral sense" would prevent insiders from abusing their prior knowledge (Hendrickx and Van gulck, 1991). In the same year, a new transparency law was introduced that required notification of any substantial changes in the ownership structure of listed firms, as well as a law governing public takeover bids, which regulated the announcement and specified the procedure for takeover bids for listed firms (Geens, 1990). A Belgian Corporate Governance Code was developed in 2004 (Commissie Corporate Governance, 2004).

2.2 Taxation

Dividend taxation also changed drastically between 1838 and 2012. Dividends were not taxed before World War I. The Belgian taxation system was reformed completely for the first time in 1920. From then on, dividends were subject to taxes. The profit generated by a company was never subject to double taxation: either the profit was distributed as a dividend, in which case the shareholder paid a tax of 10% on the distributed dividend (*taxe mobilière*), or the profit was retained, in which case the company paid a tax on the profit at a maximum rate of 10% (*taxe professionnelle*). If the company decided later to distribute dividends from the retained earnings, then the company could recover the *taxe professionnelle* entirely from the shareholders, who then had to pay the *taxe mobilière*. Under this system, companies could thus avoid paying taxes on their profits simply by distributing the profit as a dividend. If the shareholder was a natural person, dividends were also included in the global income of the shareholder, on which natural persons needed to pay an additional tax (*supertaxe*). Taxation legislation has changed many times since 1920: the dividend tax rate was adapted, the *supertaxe* was abolished in 1930, and during World War II companies could temporarily not avoid paying taxes on their profits, as both the *taxe professionnelle* (paid by companies) and the *taxe mobilière* (paid by shareholders) were payable. The Belgian tax system was reformed a second time in 1962. A distinction was made between dividends received by natural persons and dividends received by corporations. In the first case, companies paid a tax on the realized profits and shareholders paid a tax on the dividends received. For corporations, this double taxation was partly avoided if the dividend-receiving company had a long-term investment in the dividend-distributing company. In this case, the distributing company needed to pay taxes on its realized profits. For the receiving company, the dividend was partly tax-exempt[4]. Until 1985, dividends were additionally taxed as part of the personal

[4] Initially, 90% of the dividend was tax-exempt if the receiving company had a long-term investment in the distributing company. After introduction of the European Parent-Subsidiary Directive, 95% of the dividend was tax-exempt (Op de Beeck, 2005).

income of natural persons. In 2012, this indirect dividend taxation was reintroduced for one year. Table I − 1 shows an overview of the evolution of the dividend taxation system in Belgium.

Table I − 1 Evolution of dividend taxation in Belgium This table shows the evolution of the Belgian dividend taxation system. A distinction is made between direct dividend taxation, for which we show the dividend tax rate, and the indirect dividend taxation. Dividends may be taxed indirectly in two different ways: either as part of company profits and/or as part of the global income of the taxpayer.

Year	*Dividend tax rate*	*Tax on company profits?*	*Taxed as part of personal income of taxpayer?*
1920	10%	NO	YES
1923	15%	NO	YES
1926	22%	NO	YES
1930	22%	NO	NO
1932	24.2%	NO	NO
1940	26.4%	NO	NO
1941	10%	YES	NO
1942	12%	YES	NO
1943	15%	YES	NO
1947	30%	NO	NO
1962	15%	YES	YES
1967	20%	YES	YES
1985	25%	YES	NO
1993	25.75%	YES	NO
1996	25%	YES	NO
2012	25%	YES	YES

Source: Buissert (1943); Buissert and Cauwe (1947); Centre d'Etude des Sociétés (1941); De Mey (1930); Dielen (1933); Ergo Insurance Group (2013); Gilson (1921); Henry (1967); Lapotre (1924); Memento der Effecten (1994) ; Memento der Effecten (1997); Op de Beeck, 2005; Requette, (1928); Vanthienen and Vermaelen (1987).

Apart from dividends, shareholders can also receive income in the form of capital gains and/or share repurchases. Capital gains were always tax-exempt before 1962. After reform of the taxation system in 1962, capital gains were taxed in some very specific cases[5] (Coppens and Bailleux, 1985). Share repurchases were tax-exempt until 2002, after which they were taxed at a 10% rate (De Beule, 2003).

3. Data and dividend measures

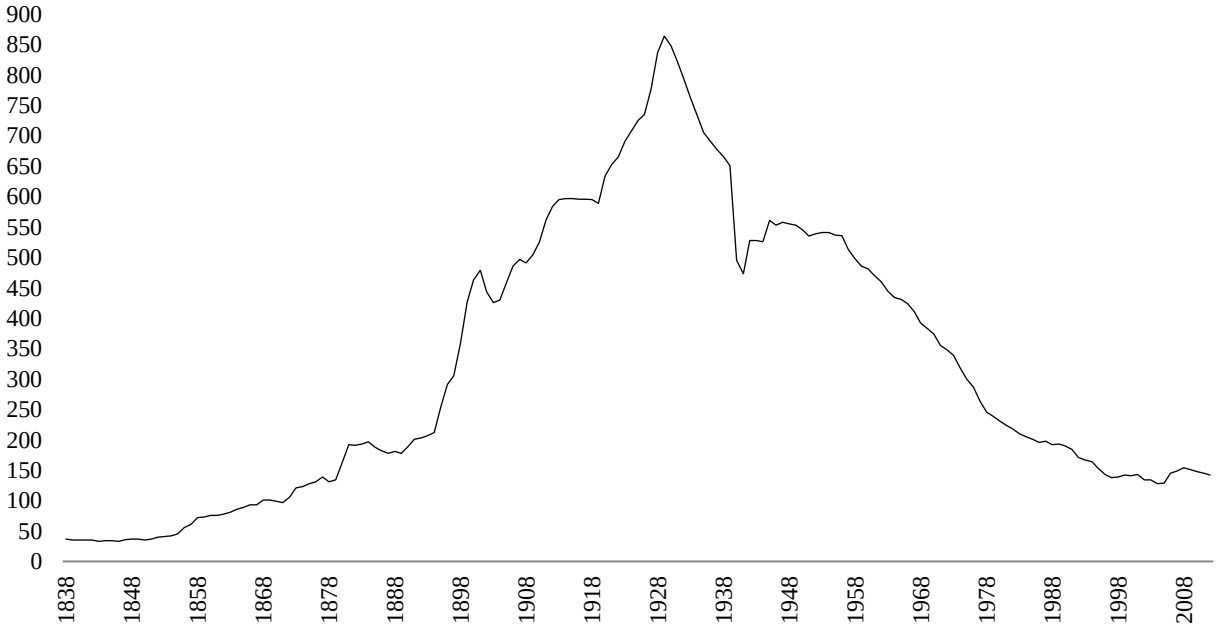
3.1 Data

This research relies on the database of the Studiecentrum voor Onderneming en Beurs (SCOB) at the University of Antwerp, which contains information on every individual stock ever listed on the BSE. End-of-month stock prices, number of shares, dividend information (dividend paid, ex-dividend day) and capital operations (stock dividends and stock splits) are available for each stock. The data are highly reliable, as they are hand-collected and cross-checked using different sources. We collect data on 2,048 unique common stocks issued by 1,792 firms listed on the BSE since 1838. Only Belgian and Colonial firms listed on the spot market are considered. Figure I − 1 shows the evolution of the number of firms listed on the BSE between 1838 and 2012. Early in the period, very few firms were listed, but beginning in 1873, the number

[5] Capital gains realized by physical persons managing their own portfolios as prudent persons are not subject to taxes. Capital gains realized as a result of speculation are subject to taxes (Coppens and Bailleux, 1985).

of firms increased sharply. In 1929, the number of firms peaked and then began to decrease. Especially after World War II, the BSE lost importance, as companies in the coal mining industry, the steel industry and colonial companies—three industries that were of huge importance for the BSE—delisted.

Figure I − 1 Evolution in number of stocks on BSE, 1838−2012 This figure shows the evolution in the number of listed stocks in our sample.



Additionally, we collect data on inflation and the short-term interest rate from different sources (an overview of our sources can be found in Appendix I−A). Inflation in year *t* is measured as the difference in consumer price index compared to year *t*−1. The short-term interest rate is measured as the open market discount rate for commercial paper (1838–1940) and the interest rate on Belgian Treasury Bills (1940–2012).

3.2 Dividend measures

We measure dividend policy in several ways. First, we calculate *Propensity to pay*$_{all\ stocks}$, which measures the percentage of all stocks paying a dividend in a given year. Following Baker and Wurgler (2004), the number of payers in year *t* is calculated as follows:

$$Payers_t = New\ Payers_t + Old\ Payers_t + List\ Payers_t \quad \text{(I.1)}$$

New Payers$_t$ is equal to the number of stocks among the nonpayers in year *t*−1 that initiate a dividend in year *t*. *Old Payers*$_t$ includes the number of payers that paid a dividend in year *t*−1 and that also pay a dividend in year *t*. It is calculated as:

$$Old\ Payers_t = Payers_{t-1} + New\ Nonpayers_t + Delist\ Payers_t \quad \text{(I.2)}$$

New Nonpayers$_t$ is all stocks that paid a dividend in year $t-1$, but that omitted their dividend in year *t*. *Delist Payers*$_t$ is stocks that paid a dividend in year *t-1* but that are no longer in the sample in year *t*. Finally, *List Payers*$_t$ is stocks that pay a dividend and that were not in the sample the preceding year. The *Propensity to pay*$_{all\ stocks,t}$ is thus calculated as follows:

$$Porpensity\ to\ pay_{all\ stocks,t} = \frac{Payers_t}{Total\ number\ of\ listed\ stocks_t}. \tag{I.3}$$

We calculate three variables to capture dividend payment dynamics:

$$Initiate_t = \frac{New\ Payers_t}{Nonpayers_{t-1} - Delist\ Nonpayers_t}, \tag{I.4}$$

$$Continue_t = \frac{Old\ Payers_t}{Payers_{t-1} - Delist\ Payers_t}, \tag{I.5}$$

$$Propensity\ to\ pay_{new\ stocks,t} = \frac{List\ Payers_t}{List\ Payers_t + List\ Nonpayers_t} \tag{I.6}$$

Initiate$_t$ is the initiation rate among stocks that are listed both in year $t-1$and in year *t*. *Continue*$_t$ measures how many of the surviving payers continue paying a dividend; it can also be regarded as 1 minus the propensity to omit. Finally, *Propensity to pay*$_{new\ stocks,t}$ measures the propensity to pay among newly listed stocks and can also be regarded as the initiation rate among these stocks. Next to these dividend dynamics, we also calculate the dividend yield[6] as the sum of all dividends paid out during the year divided by the stock price at the end of the previous year.

4. Evolution of dividend policy

First let us investigate how the dividend policy of listed firms evolves between 1838 and 2012. We subdivide the entire period into five subperiods: before World War I (1838– 1913), World War I (1914–1918), the Interbellum (1919–1939), World War II (1940–1945) and post–World War II (1946–2012). This enables us to account for the effect of both world wars, which had a huge impact on the Belgian economy and on the

[6] We focus on the dividend yield rather than the dividend payout ratio because there are no income statement data available before 1873, and there was huge variation in the calculation of earnings across firms long after 1873, due to very limited accounting regulations.

BSE. During World War I and World War II, the BSE was temporarily closed[7], but trading continued on informal markets. Moreover, the German occupier introduced a number of restrictions that were likely to affect the dividend policy of Belgian firms (e.g., during World War II, the dividend was restricted to 6% of the social capital and legal reserves (Deswarte, 1942)). The evolution of dividend policy is shown in Figure I − 2. Descriptive statistics are included in Appendix I−B.

Panel A of Figure I − 2 describe the evolution of *Propensity to pay*$_{all\ stocks}$. Over the entire period, the average propensity to pay of all stocks is 61.09%. The pre–World War I and the post–World War II averages are very comparable (63.44% and 65.44%, respectively). During and between the wars, the average propensity to pay is lower: 26.96% during World War I, 50.90% during the Interbellum, and 46.84% during World War II. Panel A of Figure I − 2 also includes the dividend tax rate throughout the period (right axis). The evolution of *Initiate*$_t$, the percentage of non-paying listed stocks in year $t-1$ that do pay a dividend in year t, is shown in Panel B. The annual initiation rate among already listed stocks is on average 18.33%. The initiation rate is very stable: it averages 18.80% before World War I, 17.10% during the Interbellum, 16.95% during World War II and 19.06% after World War II. Only during World War I the initiation rate is far lower (8.16%)[8]. Panel C describes the evolution of *Continue*$_t$, the percentage of listed stocks paying a dividend in year $t-1$ and in year t. The average continuation rate over the entire period is 89.76%; only 10.24% of firms omit the dividend payment. Again, the difference between the average continuation rate before World War I (92.38%), the Interbellum (86.48%) and after World War II (91.01%) is small. However, during World War I and World War II, fewer stocks continue paying a dividend (65.18% and 74.43%, respectively). The results for *Propensity to pay*$_{new\ stocks}$, that is, the propensity to pay (or initiation rate) among newly listed stocks, are shown in Panel D. Over the entire period, 32.72% of new stocks pay (initiate) a dividend. The average initiation rate among newly listed stocks is also very comparable in the non-war periods: 34.50% before World War I, 31.85% during the Interbellum and 33.26% after World War II. Again, the average value drops during World War I (5.56%) and World War II (18.84%). Finally, Panel E shows the evolution of the value-weighted *Dividend yield*[9]. This value is 3.97% over the

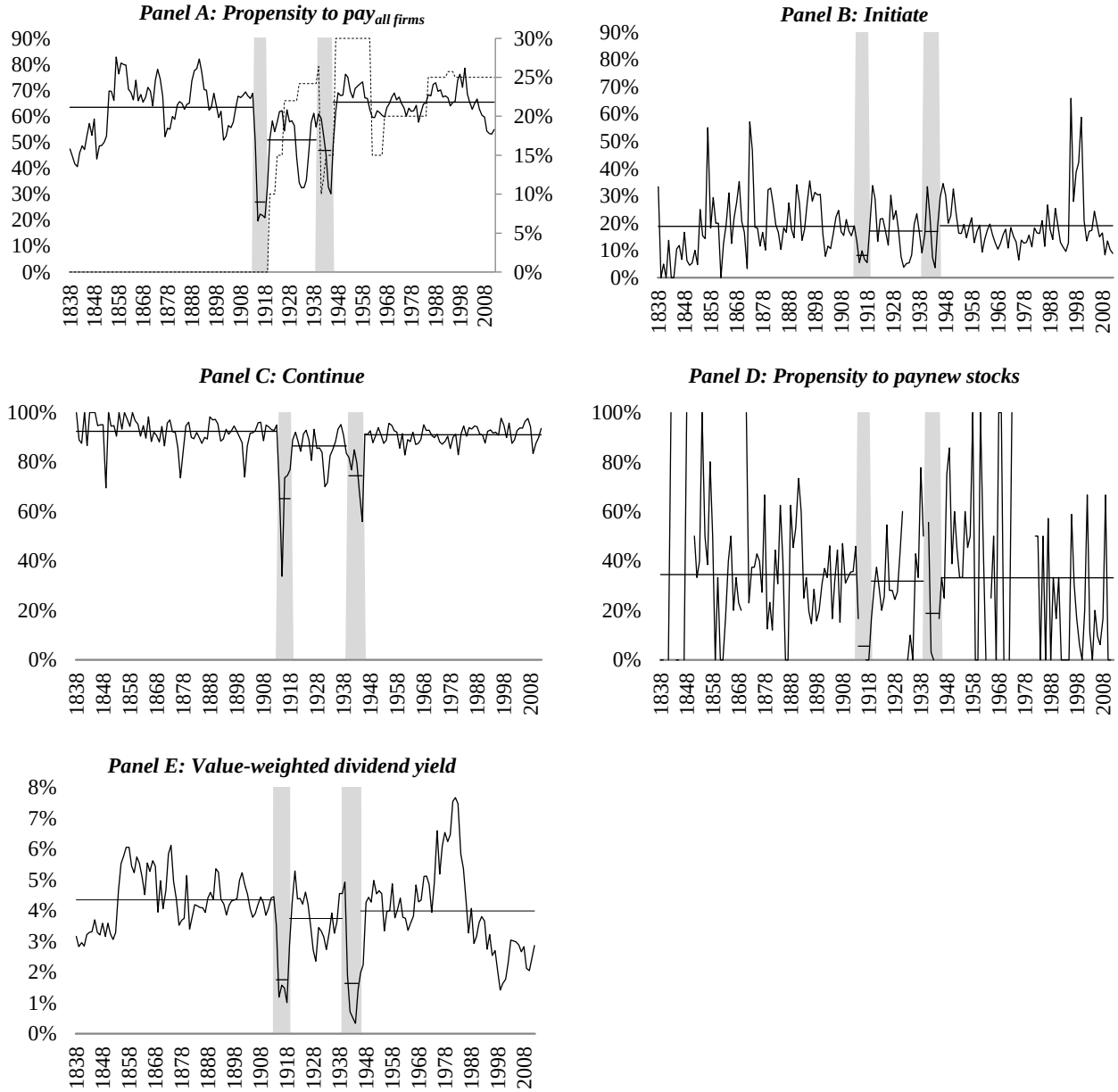
[7] During World War I, the BSE was closed from July 27, 1914 to February 5, 1919. During Wolrd War II, the BSE was closed for a first time from May 10, 1940 to September 6, 1940 and a second time from September 1944 to July 1945 (De Clercq, 1992).

[8] Very few firms that initiate during World War I or World II are first initiators. There are respectively five and eleven first imitators during World War I and World War II. We find that firms initiating in World War I or World War II are generally firms that miss one or two dividend payments in the war-years. During World War I, 436 stocks temporarily omit their dividend payment. By the end of World War I, 146 stocks (33.49%) resume their dividend. During World War II, there are 362 omitters. By the end of World War II, 206 (56.91%) of these have resumed the dividend payment. The stocks that miss one or two dividend payments during the war-years and resume their dividend account for 97.33% (84.43%) of the initiations during World War I (World War II).

[9] In unreported analyses (available at the end of this PhD dissertation), we use the equally weighted dividend yield instead of the value-weighted dividend yield, but the results are very similar.

entire period. The average dividend yield is comparable before World War I (4.35%), during the Interbellum (3.74%) and after World War II (3.99%), but drops significantly during World War I (1.75%) and World War II (1.63%).

Figure I − 2 Evolution of dividend policy, 1838−2012 This figure shows the evolution in dividend policy between 1838 and 2012. The horizontal lines in each panel represent the means of the different variables in different periods (1838−1913; 1914−1918 (World War I, shaded area); 1919−1939; 1940−1945 (World War II, shaded area); 1946−2012). In Panel A, the dotted line (right axis) represents the direct dividend tax rate.



It is interesting to compare our dividend policy results for Belgium to dividend policies in Britain between 1838 and 1870 (Acheson et al., 2009; Turner et al., 2013) and the US between 1926 and 1999 (Fama and French, 2001). The value-weighted dividend yield of Belgian firms in the period 1838–1870 (4.31%) was slightly lower than that for firms listed on the London Stock Exchange in the same period (4.95%). Belgian firms were more likely to initiate a dividend (17.33%) than their British counterparts (5.27%). However, the continuation rate was higher for British firms (97.59%) than for Belgian firms (93.96%). The propensity to pay between 1926 and 1999 in Belgium (61.48%) was very similar to the U.S (61.15%). The initiation rate was higher in Belgium (18.18%) than in the US (10.03%), but the continuation rate for Belgian firms was lower (88.47%) compared to their American counterparts (92.48%). Moreover, newly listed firms in Belgium were less likely to initiate a dividend (35.15%) than US firms (54.45%). Thus, while there were some differences, payout policy in Belgium seems to have been broadly similar to that in other industrialized countries.

5. Structural changes in dividend policy

5.1 Did dividend policy change over time?

The analysis thus far suggests that while both world wars substantially affected dividend policy, dividend policy before World War I and after World War II is surprisingly similar, despite huge differences in investor protection and taxation. The structural break approach (Bai and Perron, 1998, 2003) offers a more formal test of structural changes in dividend policy over the period considered in this study. A structural break is found whenever the average level of a variable is significantly different in the period before the break compared to the average level of the variable after the break. The structural break test consists of two parts. First, several tests are conducted to determine whether structural breaks are present in the data. If these tests reject the null hypothesis, the number of breaks and their location are estimated in the second part of the analysis. Finally, the parameter estimates (and their standard errors) of the variables in the different subperiods are calculated. A detailed description of the analysis and the entire output are presented in structural breaks are present and a second set of tests is necessary to find the number of breaks and their location. The entire output is presented in Appendix I−C. Table I − 2 summarizes the results.

For *Propensity to pay*$_{all\ stocks}$ and *Initiate*$_t$, we find no breaks in the sample period, showing that both variables are stable over time. On average, 61% of stocks pay a dividend in year *t*, whereas an average of 18% of non-paying stocks in year $t-1$ initiate a dividend in year *t*. For *Continue*$_t$, we do find a break at the start of World War I and at the end of World War II. Before World War I, 92% of the paying stocks continue distributing a dividend. During and between both world wars, only 81% of the stocks continue paying a dividend. After World War II, this percentage increases again to 91%. For *Propensity to pay*$_{new\ stocks}$, we find one break, in

1983. Before 1983, 36% of newly listed stocks pay (or equivalently, initiate) a dividend, whereas only 19% of newly listed stocks pay a dividend after 1983. Finally, for *Dividend yield*, three breaks are found: at the start of World War I, at the end of World War II and in 1986. Before World War I (1838–1914) and after World War II (1948–1986), dividend yield is relatively high (4.35% and 4.90%, respectively), compared to the dividend yield in the war-period (1915–1947) and the late post-war period (1987–2012) (2.98% and 2.76%, respectively). Our analysis includes both regular and special dividends, which make the results even more remarkable as the special dividends are the most variable part of the company's dividend policy. As a robustness check, we do the structural break analysis for dividend yield only including regular dividends[10]. Our findings remain the same.

Table I − 2 Structural break analysis In this table, the results of the structural break analysis are summarized. For each dividend measure, the break points, the periods and the parameter estimates in the periods are shown. For instance, for *Propensity to pay*$_{new\ stocks}$, a break point is identified in 1983. We thus divide the entire sample period into two subperiods: 1838−1983 and 1984−2012. In the first period, the propensity to pay is 35.87%; in the second period, it is 18.55%.

***Panel A: Propensity to pay*$_{all\ stocks}$**				
Break points	No breaks			
Periods	1838-2012			
Parameter estimates	61.09%			
Panel B: Initiate				
Break points	No breaks			
Periods	1838-2012			
Parameter estimates	18.33%			
Panel C: Continue				
Break points	1913, 1945			
Periods	1838-1913	1914-1945	1946-2012	
Parameter estimates	92.38%	80.89%	91.09%	
***Panel D: Propensity to pay*$_{new\ stocks}$**				
Break points	1983			
Periods	1838-1983	1984-2012		
Parameter estimates	35.87%	18.55%		
Panel E: Dividend yield				
Break points	1914, 1947, 1986			
Periods	1838-1914	1915-1947	1948-1986	1987-2012
Parameter estimates	4.35%	2.98%	4.90%	2.76%

Consistent with our findings in Section 4, we find a significant impact from both world wars. In contrast, before World War I and after World War II, dividend policy is surprisingly comparable, despite the differences in investor protection and taxation. In the 1980s, dividend policy changed again. The structural changes in dividend policy do not coincide with important changes in investor protection (e.g., in 1873),

[10] With the available data, it is impossible to exactly differentiate between regular dividends and special dividends. Therefore, we try to remove special dividends in different ways from the analysis. First of all, we define a dividend as a special dividend if a stock increases the number of payments in year t, compared to year t- 1 and reverses the increase in the number of payments in year t+1. Second, if the sum of the dividends paid in year t is at least twice the amount of the dividends paid in year t-1, we also assume a special dividend payment has taken place in year t. In both cases, the dividend in year t is replaced by the amount of dividend paid in year t-1. Finally, we also winsorize the amount of dividend paid on stock level at the 99th (95th) percentile. This technique allows us to replace the extremely high dividends by a lower amount (the 99th (95th) percentile). The results, available at the end of this dissertation, of the structural break analysis barely change regardless which of the definition of special dividends is used.

nor with important changes in tax legislation (e.g., in 1920)[11]. Again, these results suggest a weak (at best) link between dividend policy and the institutional environment in which firms operate.

5.2 Impact of World War I and World War II

Both the descriptive analysis and the structural break analysis show that the world wars significantly affect dividend policy of listed Belgian firms. Therefore, we repeat the structural break analysis without the war-years (1914–1918, 1940–1945). The summarized results are shown in Table I − 3[12].

Table I − 3 Structural break analysis without World War I (1914−1918) and World War II (1940−1945) In this table, the results of the structural break analysis are summarized. For each dividend measure, the break points, the periods and the parameter estimates in these periods are shownd. For instance, for *Propensity to pay*$_{new\ stocks}$ a break point is identified in 1986. We thus divide the entire sample period into two supberiods: 1838−1986 and 1987−2012. In the first period, the propensity to pay is 37.21%, in the second period, it is 18.55%

***Panel A: Propensity to pay*$_{all\ firms}$**		
Break points	No breaks	
Periods	1838-2012	
Parameter estimates	62.65%	
Panel B: Initiate		
Break points	No breaks	
Periods	1838-2012	
Parameter estimates	18.69%	
Panel C: Continue		
Break points	1865	
Periods	1838-1865	1866-2012
Parameter estimates	94.55%	90.35%
***Panel D: Propensity to pay*$_{all\ stocks}$**		
Break points	1983	
Periods	1838-1982	1983-2012
Parameter estimates	37.21%	18.55%
Panel E: Dividend yield		
Break points	1986	
Periods	1838-1986	1987-2012
Parameter estimates	4.38%	2.76%

For *Continue*$_t$, *Propensity to pay*$_{new\ stocks,t}$ and *Dividend yield*$_t$, we find a break (Table I − 3) at the start of World War I and at the end of World War II. These breaks disappear if we exclude the war-years from the analysis, showing that the world wars completely drive the former results. For *Propensity to pay*$_{new\ stocks,t}$ and *Dividend yield*$_t$, the break in the 1980s remains. For *Continue*$_t$, a new break appears in 1865. Before 1865, 95% of the paying stocks continue paying a dividend. From 1865 onwards, 90% maintain the dividend

[11] In an unreported analysis, available at the end of this PhD dissertation, we focus on a subsample of long-lived firms only. We consider a firm to be long-lived if it is in the sample for at least half the sample period (i.e., at least 88 years). Focusing on this subsample of 98 firms allows us to investigate dividend policy for a more homogenous sample. Moreover, these firms are very exposed to the altering institutional environment. For these firms, we calculate the Propensity to payall stocks and the Value-weighted dividend yield (we do not calculate the other dividend measures since the sample is, in many years, too small to calculate these variables). Here, we find no break for Propensity to payall stocks nor for Dividend yield.

[12] Complete results are again reported in the Appendix (Table C. II).

payment[13]. Thus, again, despite huge differences in the institutional environment before World War I and after World War II, we find that the dividend policy of listed Belgian firms is surprisingly stable over time.

The breaks at the start of World War I and at the end of World War II coincide with huge changes in the taxation legislation, which makes it difficult to disentangle the impact of both world wars from the impact of taxation. For several reasons, we believe that the breaks in dividend policy (*Continue*$_t$ and *Dividend yield*$_t$) are driven by the wars and not by taxation. First, as pointed out by Hardewyn (2003) and confirmed by contemporaneous newspapers (L'Echo du Soir and Moniteur des intérêts matriels), the major concern of taxpayers regarding the new taxation system of 1920 was the introduction of the supertaxe (i.e. an additional tax on the global income of the tax payer), and not the introduction of a tax on dividends. Moreover, the tax rate was considered to be low – especially since a tax on the entire wealth rather than on the income from that wealth (e.g. dividends) had been expected. Second, in the absence of a proper and efficient control mechanism, tax fraud was not uncommon in the period between 1920 and 1962, and different constructions were used to avoid taxation. This was especially the case for all types of taxation on the income from financial wealth (e.g. dividends, interest income). For instance, the distributed dividends were paid to a foreign bank account, which made it impossible for the Belgian tax administration to trace them. Alternatively, rather than directly investing in Belgian companies, investors placed their shares in a foreign holding (mostly located in a tax haven), which was the shareholder of this company. Different alternatives were available to extract money from this foreign holding in a tax-friendly way (Hardewyn, 2003). In Section 7 of this paper, we will further investigate the relationship between dividend policy and taxation.

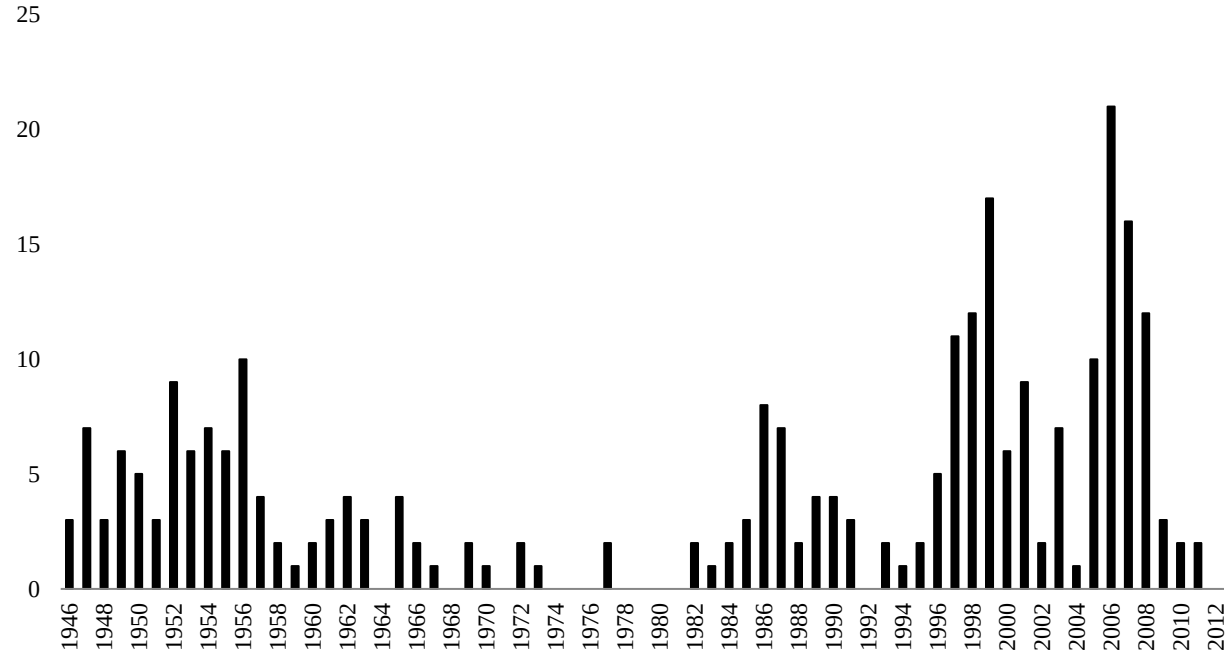
5.3 Changing composition of the stock market

We find a third break for *Propensity to pay*$_{new\ stocks,t}$ and *Dividend yield*$_t$ in the mid-1980s. This break in the mid−1980s coincides with a revival of the BSE. Figure I − 3 shows the evolution of the number of IPOs on the BSE after World War II. The number of IPOs remains considerable until 1960, but during the next two decades, there were barely IPOs. There were in total 107 IPOs in the early post-war period 1946–1985 (i.e., 2.68 firms per year on average). In this period, the average propensity to pay among newly listed stocks was 46.01%. In the mid-1980s, the number of IPOs increased again. In the late post-war period, 1986– 2012, 169 firms went public (i.e., 6.26 firms per year on average). These new firms were less likely to pay a dividend compared to the new firms that were introduced in the early post-war period, since the average

[13] Starting in the 1860s, the Belgian economy was characterized by increasing liberalization, leading to deregulation: listing requirements and incorporation requirements became less severe. Many new companies were introduced on the BSE during this liberalization wave, but these companies were in many cases fraudulent and were often only misleading shareholders (De Clercq, 1992). The decreasing quality of listed companies might be an explanation for the drop in continuation rate.

propensity to pay dropped to 18.06%. In this late post-war period, particularly growth firms and high-tech firms (arguably with many investment opportunities) were introduced on the BSE.

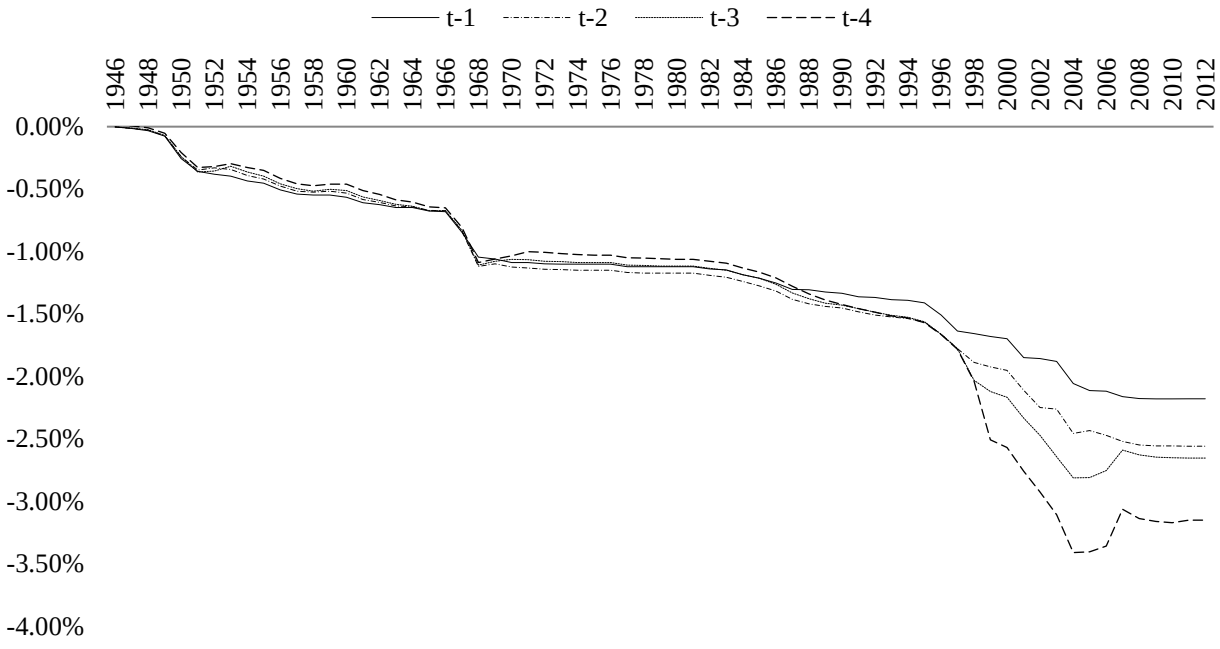
Figure I − 3 Evolution of the number of IPOs, 1946−2012 This figure shows the evolution in the number of new firms introduced on the BSE in the post-World War II period.



Following Jank (2015), we compare the dividend yield of all stocks listed on the BSE with the dividend yield of all continuously listed stocks on the BSE. Jank (2015) defines a firm to be continuously listed if it is in the sample in year *t* and in year *t*−1. Since IPO activity was very low in Belgium in the post-war period, we consider firms to be continuously listed if they are in the sample in year *t*−1, and additionally tighten the definition of a continuously listed firm up to four lags (meaning that a firm is considered continuously listed if it is in the sample in year *t*−1 up to year *t*−4). Figure I − 4 shows the evolution of the cumulative difference in the post- war period (1946–2012). In the early post-war period (1946–1985), the cumulative difference is very stable[14]. Beginning in 1986, however, the cumulative difference strongly decreases, suggesting that the lower dividend yield in the post-war period is at least partly driven by the lower dividend yield of the newly listed stocks.

[14] The drop in the cumulative difference in 1967 and 1968 is caused by the issuance of two new stocks by Solvay. Both new stocks pay no or a very low dividend and have a relatively high market capitalization.

Figure I − 4 Cumulative difference in dividend yield of all stocks and continuously listed stocks, 1946−2012. This figure shows the evolution f the difference in dividend yield of all stocks listed on the BSE and all continuously listed stocks. A stock is considered to be continuously listed if it is in the sample in year *t* and in year *t*−1. We also define continuously listed firms if they are in the sample in year *t*−1, *t*−2, *t*−3 and *t*−4. The difference between these dividend yields is attributed to changing composition of the stocks listed on the BSE. The drop in 1967 and 1968 is caused by the introduction of one new stock that does not pay a dividend.



5.4 Share repurchases

Share repurchases are potentially a substitute for dividends. It is therefore important to take into account share repurchases when considering changes in dividend policy. Data on share repurchases at the BSE are not widely available, but it seems very unlikely that share repurchases were of any importance on the BSE in the 19th and 20th centuries. First, the SCOB database allows us to identify stocks for which the number of shares outstanding declines. We can identify the reason for decline for 159 cases of a declining number of shares. Only 20 of these cases involved a share repurchase; the first one occurs in 2007[15]. Further, authoritative contemporaneous writers (e.g. Chlepner, 1930; Théate, 1905) do not mention occurrences of share repurchases. The Banking Commission, which was responsible for supervision of listed companies beginning in 1935, opposed share repurchases, which it considered as *"a source of abuses, corruption and speculations"* (Bankcommissie, 1948, p. 67). Even at the end of the 20th century, share repurchases were still not an established practice in Belgium (KBC, 1999). Share repurchases became more popular only in the 21st century, but since we do not find any severe change in dividend policy after 1986, it is unlikely that share repurchases drove changes in dividend policy.

[15] The most important reason for a decline in the number of outstanding shares was a reverse stock split (98 cases). Other reasons include exchange of one type of stock for another type, and mergers and acquisitions.

5.5 The legal environment and dividend policy

In order to control for the impact of the changing legal environment, we regress the five dividend measures on investor protection variables and a tax variable. As regards the investor protection variables, we use dummy-variables to indicate important changes in the Belgian Commercial Code (1841, 1873, 1913, 1934, 1953, 1975, 1985, 1989). We include 1838−regime (a dummy equal to 1 between 1838 and 1840), 1873-regime (a dummy equal to 1 between 1873 and 1912, 0 otherwise), 1913−regime (a dummy equal to 1 between 1913 and 1933, 0 otherwise), 1934−regime (a dummy equal to 1 between 1934 and 1952, 0 otherwise), 1953−regime (a dummy equal to 1 between 1953 and 1974, 0 otherwise), 1975−regime (a dummy equal to 1 between 1975 and 1984, 0 otherwise), 1985−regime (a dummy equal to 1 between 1985 and 1988, zero otherwise) and 1989−regime (a dummy equal to 1 from 1989 onwards, 0 otherwise). The 1841−regime (1841−1872) is the base period. For tax, we include a dummy equal to 1 from 1920 onwards, as dividend taxes are introduced in this year. Finally, as a control variable, we also include a war-dummy equal to 1 during World War I (1914−1918) and World War II (1940−1945) and 0 otherwise. We use Newey-West standard errors (1987) with four lags. Results of the regression analysis are reported in Table I − 4.

The tax-dummy is significant in none of the regression models. Therefore, our results cannot confirm that the introduction of taxation has an impact on dividend policy of listed Belgian firms. Most of the investor protection dummies are also not significant. For some dividend measures, we find differences across legal regimes. However, it seems unlikely that a difference in the level of investor protection is the driver of these results. For instance, for *Propensity to pay*$_{all\ stocks,t}$, we find that during the 1838−regime and the 1913−regime, the propensity to pay for all stocks is lower compared to the 1841−regime. The coefficient estimates for both dummies are more or less the same (-0.1811 for the 1838−regime and -0.1823 for the 1913−regime). This indicates that despite the fact that investor protection was better under the 1913−regime than under the 1838−regime, the propensity to pay is approximately the same in both regimes. Another example concerns *Dividend yield*$_t$. The dividend yield under the 1841−regime is on average equal to 4.44%. Under the 1975−regime, dividend yield increases by 2.20%, to 6.64%. However, under the 1989-regime, when investor protection further improved compared to 1975, the dividend yield drops by 1.68% to 2.72% compared to the 1841−regime. This evidence is hard to reconcile with the argument that dividends should be more important when investor protection is weak. These results are likely to be driven by other factors, such as the changing nature of firms listed on the BSE or the changing macroeconomic environment.

Table I − 4 Dividend policy under different investor protection regimes This table shows the results of the regression analysis with the dividend measures as dependent variables, and investor protection variables and a tax-variable as independent variables. We include 1838−regime (a dummy equal to 1838-regime (a dummy equal to 1 between 1838 and 1840), 1873−regime (a dummy equal to 1 between 1873 and 1912, 0 otherwise), 1913−regime (a dummy equal to 1 between 1913 and 1933, 0 otherwise), 1934−regime (a dummy equal to 1 between 1934 and 1952, 0 otherwise), 1953−regime (a dummy equal to 1 between 1953 and 1974, 0 otherwise), 1975−regime (a dummy equal to 1 between 1975 and 1984, 0 otherwise), 1985−regime (a dummy equal to 1 between 1985 and 1988, zero otherwise) and 1989−regime (a dummy equal to 1 from 1989 onwards, 0 otherwise). The 1841−regime (between 1841 and 1872) is the base period in the regression analysis. We also include a tax-dummy equal to 1 from 1920 onwards. We include a war-dummy (equal to 1 between 1914 and 1918 (World War I) and between 1940 and 1945 (World War II)) as control variable. We use Newey-West standard errors with four lags. For Propensity to paynew stocks, we use robust standard errors as this is not a continuous time-series. Coefficients and standard errors (between parentheses) are shown. *, ** and *** represent significance of 10%, 5% and 1%, respectively.

	Propensity to pay $_{all\ stocks}$	***Initiate***	***Continue***	***Propensity to pay*** $_{new\ stocks}$	***Value-weighted dividend yield***
Intercept	0.6261***	0.1525***	0.9396***	0.3708***	0.0444***
	(0.0422)	(0.0301)	(0.0107)	(0.0659)	(0.0038)
1838−regime	-0.1811***	-0.0247	-0.0183	-0.3708***	-0.0145***
	(0.0413)	(0.0523)	(0.0234)	(0.0659)	(0.0037)
1873−regime	0.0279	0.0683*	-0.0287*	-0.0289	-0.0005
	(0.0474)	(0.0368)	(0.0148)	(0.0715)	(0.0040)
1913−regime	-0.1823*	0.0011	-0.0776**	-0.0589	-0.0061
	(0.1035)	(0.0440)	(0.0389)	(0.1089)	(0.0064)
1934−regime	-0.1225	0.0338	-0.0159	0.0721	-0.0055
	(0.1328)	(0.0677)	(0.0422)	(0.1487)	(0.0084)
1953−regime	-0.0573	-0.0262	-0.0261	0.0744	-0.0013
	(0.1083)	(0.0500)	(0.0447)	(0.1485)	(0.0080)
1975−regime	-0.0912	-0.0469	-0.0361	0.0452	0.0220***
	(0.1067)	(0.0509)	(0.0447)	(0.1745)	(0.0084)
1985−regime	-0.0119	0.0082	0.0119	-0.1036	-0.0010
	(0.1070)	(0.0506)	(0.0440)	(0.1820)	(0.0083)
1989−regime	-0.0636	0.0347	-0.0087	-0.1922	-0.0168**
	(0.1096)	(0.0663)	(0.0446)	(0.1252)	(0.0081)
Tax dummy	0.0892	0.0311	-0.0114	0.0006	-0.0007
	(0.0979)	(0.0394)	(0.0427)	(0.0964)	(0.0069)
War dummy	-0.1469**	-0.0588	-0.1872***	-0.2557**	-0.0213***
	(0.0736)	(0.0433)	(0.0441)	(0.1023)	(0.0042)
Estimated model	OLS	OLS	OLS	OLS	OLS
Observations	175	175	175	154	175
R^2	43.24%	11.08%	48.82%	13.82%	61.90%
Adjusted R^2	39.78%	5.66%	45.70%	7.80%	59.57%

6. Firm characteristics, macroeconomic environment and dividend policy

In this section, we investigate whether our findings remain valid after controlling for firm characteristics and macroeconomic factors. We estimate panel regression models in which the dependent variables are $Payer_{all\ stocks}$, a dummy equal to 1 if a stock pays a dividend in year *t* and 0 otherwise; *Initiate*, a dummy equal to 1 if an already listed stock initiates a dividend in year *t* and 0 otherwise; *Continue*, a dummy equal to 1 if a stock paying a dividend in year *t*−1 also pays a dividend in year *t* and 0 otherwise; $Payer_{new\ stocks}$[16] a dummy equal to 1 if a new stock pays a dividend and 0 if the new stock does not pay a dividend; and *Dividend yield* of the stock at the end of year *t*. Based on our previous results, we a priori identify six periods:

[16] As a robustness check, we also run the regression analysis for $Payer_{new\ firms}$. The results, available at the end of this PhD dissertation, remain the same.

the pre-war period (1838–1913), World War I (1914–1918), the Interbellum (1919–1939), World War II (1940–1945), the early post-war period (1946–1985) and the late post-war period (1986–2012). We include a dummy variable for each of these periods in the regression, using the pre-war period as the base period. Firm characteristics included in the regression are firm size, firm age and firm-fixed effects. We additionally include interaction variables between the period dummies and firm size and firm age to account for the possibility of changing effects of firm size and firm age over time[17]. Firm size is calculated as the logarithm of market capitalization at the end of year *t*-1, which is calculated as the product of the number of shares outstanding at the end of each year and the year-end stock price, while firm age reflects the logarithm of the number of years that the firm has been listed. If a firm has more than one stock outstanding, the market capitalization of this firm is equal to the sum of the market capitalization of the individual stocks. To account for the changing macroeconomic environment, inflation and short-term interest rates are included as control variables.

As a robustness check, we also estimate regressions in which we calculate firm size as the percentile of BSE firms that have the same or smaller market capitalization. Calculating size in this way neutralizes any effect of growth in the typical firm size over time (Fama and French, 2001). We adjust firm age in the same way by considering the percentile of BSE firms that have the same age or are younger. The unreported analyses, available at the end of this PhD dissertation, confirm our base results.

For $Payer_{all\ stocks}$, *Initiate*, *Continue* and $Payer_{new\ stocks}$, we run a logit model, and for *Dividend yield*, we run a linear regression model. Following Petersen (2009), we cluster standard errors both by firm and year, thereby taking into account time-series dependence as well as cross-sectional dependence. Results are reported in Table I − 5. To save space, we do not report the coefficient estimates of the control variables. Panel A shows the regression results, while Panel B reports the results of Wald tests, which test for differences between the periods considered. If the null hypothesis of equality of the period dummies is rejected, we perform pairwise t-tests to identify the mutual differences (Panel C).

The results shown in Table I − 5 suggest that dividend policy is very stable over time even after controlling for firm characteristics and the macroeconomic variables: most of the period dummies are insignificant. However, the null hypothesis of the Wald tests for equality of all coefficients in all subperiods is rejected. After excluding the dummies for World War I and World War II, the Wald test is insignificant for all

[17] For $Payer_{new\ stocks}$, we typically have only one observation per corporation (i.e. the year when a stock is introduced to the BSE). Therefore, we remove firm age, firm-dummies and the interaction-effect between firm age and the period-dummies from the analysis.

regressions, except for Initiate. For this regression, we perform pairwise t-tests comparing dividend policy in different periods. We find the initiation rate to be higher from World War II onwards. In summary, we conclude that even after controlling for firm characteristics and macroeconomic conditions, the results of the previous analyses remain valid.

Table I − 5 Dividend policy controlling for firm characteristics and macroeconomic environment Panel A shows the results of the regression analyses. *Payer*$_{all\ stocks}$ is equal to 1 if a stock pays a dividend in year *t* and 0 otherwise. *Initiate* is equal to 1 if a stock that did not pay a dividend in year *t*−1 does pay a dividend in year *t* and 0 otherwise. *Continue* is equal to 1 if astock that did pay a dividend in year *t*−1 does also pay a dividend in year *t*. *Payer*$_{new\ stocks}$ considers only newly listed stocks and is equal to 1 if a new stock pays a dividend in year *t* and 0 otherwise. *Dividend yield* measures the dividend yield of a stock (in %). Coefficient estimates and significance levels (*, ** and *** represent significance of 10%, 5% and 1%, respectively) as well as standard errors (in parentheses) are reported. Standard errors are clustered by firm as well as year (Petersen, 2009). For space considerations, we do not report the coefficients of the control variables (age, size, firm dummies, interaction effects between age and period dummies and between size and period dummies, short-term interest rates and inflation). In Panel B, the results of the Wald tests (χ^2-statistic) are reported. In case of rejection of the null hypothesis, we also perform pairwise t-test in Panel C. The results of the pairwise t-tests are reported as follows: - means that the dividend measure is significantly lower in the earlier of the two periods, + means that the dividend measure is significantly higher in the earlier of the two periods and N.S. means that the difference is not significant.

Panel A: Regression analysis

	Payer$_{all\ stocks}$	*Initiate*	*Continue*	*Payer*$_{new\ stocks}$	*Dividend yield*
World War I	-2.655	-2.003	3.142*	-33.723***	2.645**
	(1.998)	(2.338)	(1.820)	(1.404)	(1.138)
Interbellum	-1.601	-0.117	4.292**	1.071	2.035
	(1.643)	(1.597)	(1.741)	(1.334)	(1.549)
World War II	5.501***	6.182***	11.327***	omitted	9.860***
	(1.999)	(2.111)	(1.743)		(1.924)
Early post-war	0.955	4.550**	6.821***	2.107	2.758
	(1.830)	(1.970)	(2.148)	(2.720)	(1.991)
Late post-war	3.222	6.672*	7.496	-1.645	-1.318
	(3.592)	(3.674)	(4.712)	(1.331)	(2.996)
Estimated model	Logit	Logit	Logit	Logit	OLS
Observations	50.908	19,343	30,018	1,995	55,103
R^2					17.66%
Pseudo-R^2	37.38%	23.54%	22.95%	2.28%	

Panel B: Wald Tests

	Payer$_{all\ stocks}$	*Initiate*	*Continue*	*Payer*$_{new\ stocks}$	*Dividend yield*
Wald test, all coefficients	22.08***	21.60***	31.08***	673.02***	30.72***
Wald test, without world wars	3.68	13.06***	3.21	4.36	1.76

Panel C: Pairwise t-tests (only required for Initiate)

	Interbellum	World War II	Early post-war	Late post-war
World War I	N.S.	- ***	- **	- **
Interbellum		- ***	- ***	- **
World War II			N.S.	N.S.
Early post-war				N.S.

7. The (non) importance of dividend taxation

7.1 Regression analysis

In a similar framework as in Table I − 5, we estimate regression models in order to investigate the impact of taxation on dividend policy. Using panel regressions, we regress the dividend variables (*Payer*$_{all\ stocks}$, *Initiate*, *Continue*, *Payer*$_{new\ stocks}$ and *Dividend yield*) on dividend tax measures. We include the direct dividend tax rate (Table I − 1), a personal tax dummy (equal to 1 if dividends are also taxed as part of the

personal income and 0 otherwise) and an interaction variable between both tax-variables as independent variables. We control for firm characteristics (firm size, firm age and firm-fixed effects) and measures for the macroeconomic environment (inflation and short-term interest rate). Standard errors are clustered by firm and year. Results are reported in Table I − 6.

Table I − 6 Dividend policy and the taxation system In this regression, we include three taxation variables: the direct dividend tax rate, which is equal to the dividend tax rate, the personal tax-dummy, which is one whenever a shareholder had to pay an additional tax on the dividend and zero otherwise, and an interaction variable between the previous two measures. We control for firm characteristics (age, size and firm-fixed effects) and macro-economic variables (inflation and short-term interest rate). Coefficient estimates and standard errors (between parentheses) are shown. Standard errors are clustered by as well firm as year (Petersen, 2009). *, ** and *** represent significance of 10%, 5% and 1%, respectively.

	***Payer**$_{all\ stocks}$*	***Initiate***	***Continue***	***Payer**$_{new\ stocks}$*	***Dividend yield***
Direct dividend tax rate (ddt)	-2.401	1.394	-1.120	-0.493	1.001
	(1.662)	(1.061)	(1.837)	(1.031)	(1.623)
Personal income tax dummy (pit)	0.216	1.828***	0.527	0.439	0.615
	(0.406)	(0.631)	(0.557)	(0.291)	(0.558)
Ddt * pit	-0.236	-7.456**	-1.628	-1.828	1.566
	(2.110)	(3.368)	(2.794)	(1.575)	(3.761)
Ln(age)	-0.468***	-1.061***	-0.775***		-0.509***
	(0.084)	(0.068)	(0.097)		(0.116)
Ln(size)	0.737***	0.730***	0.713***	0.025	0.246***
	(0.086)	(0.063)	(0.097)	(0.034)	(0.068)
Inflation	-1.143	-0.240	-1.621*	-0.358	-1.351*
	(0.628)	(0.323)	(0.638)	(0.596)	(0.562)
Interest rate	-0.031	-0.017	-0.014	-0.041	0.078
	(0.038)	(0.031)	(0.038)	(0.057)	(0.047)
Estimated model	Logit	Logit	Logit	Logit	OLS
Observations	54,250	19,344	30,019	2,003	55,288
R^2					15.37%
Pseudo-R^2	28.10%	20.54%	16.35%	0.13%	

We find very little evidence that taxes affect dividend policy. The personal income tax dummy is only marginally significant (at the 10%-level) in the regression with *Initiate* as dependent variable. However, the coefficient estimate is positive, indicating that the propensity to initiate is larger if dividends are also taxed as part of the shareholder's global income, which is in contradiction with the expectations. The interaction variable between the dividend tax rate and the personal tax dummy is negative and significant (at the 10%-level) indicating that the positive effect of the personal tax dummy is smaller when the tax rate is higher. Taken together, these results suggest that taxation has very little impact on dividend policy.

7.2 Shifting dividends

When the dividend tax rate changes, firms might shift dividend payments to allow their shareholder to benefit from a more beneficial tax treatment. Similar to Hanlon and Hoopes (2014), we investigate whether firms shift dividends normally paid in January of year *t*+1 to December of year *t* in order to avoid a higher tax rate or – in case of a cut in the tax rate, whether firms shift their dividends normally paid in December of year *t* to January of year *t*+1. For the purpose of this analysis, we consider only major tax rate changes in which the dividend tax rate at least doubles (1920 (from 0% to 10%) and 1947 (from 15% to 30%)) or at

least halves (1941 (from 26.4% to 10%) and 1962 (from 30% to 15%)). As in Hanlon and Hoopes (2014), we regress the ratio of December dividends in year *t* to January dividends in year *t*+1 on dummy-variables equal to 1 for observations in 1919/1920, 1940/1941, 1946/1947 and 1961/1962. For the tax rate increases in 1920 and 1947, we expect a higher ratio of December dividends to January dividends, whereas we expect the opposite for the tax rate decreases in 1941 and 1962. We estimate the regression models using ten years of data prior and after the tax rate changes[18]. The results, reported in Table I − 7, indicate that firms generally do not shift dividends in response to dividend tax changes. Only for 1962[19], do we find that firms are shifting their dividend from January 1962 to December 1961. This is in contradiction with expectations, as the dividend tax rate decreases from 30% to 15%. From this analysis, we also conclude that the relationship between taxation and dividend policy is very weak in Belgium.

Table I − 7 Do firms shift their dividends in response to tax rate changes? This table shows the results of the ratio of December dividends of year *t* to January dividends of year *t*+1 on an indicator variable equal to 1 for observations in the year of significant tax rate changes. The regressions are estimated using data starting ten years prior to the tax rate change and ending ten years after the change in tax rate. Coefficient estimates and standard errors (between parentheses) are shown. *, ** and *** represent significance of 10%, 5% and 1%, respectively.

	Expectation	***Panel A: 1920***	***Panel B: 1941***	***Panel C: 1947***	***Panel D: 1962***
Indicator 1919/1920	+	-0.1777			
(tax rate: 0% → 10%)		(0.8161)			
Indicator 1940/1941	-		-0.1270		
(tax rate: 26.4% → 10%)			(0.5078)		
Indicator 1946/1947	+			0.6100	
(tax rate: 15% → 30%)				(0.3911)	
Indicator 1961/1962	-				2.8328*
(tax rate: 30% → 15%)					(1.5493)
Constant		1.9011***	2.4572***	2.1283***	3.6672***
		(0.2519)	(0.1567)	(0.1207)	(0.4718)
R^2		0.00	0.00	0.11	0.15
Period		1910-1930	1931-1951	1937-1957	1952-1972

8. Why is dividend policy so stable over time?

We would expect firms to pay (much) higher dividends and pursue more stable dividend policy before World War I than today, since there were no taxes and protection of investors was much weaker. Our findings therefore raise the question of why this is not the case. With respect to investor protection, one reason might be that there were alternative mechanisms to legal protection that reduced the need for investors to receive high dividends on a regular basis. A major difference between then and now is the high

[18] As robustness check, we estimate the regression models using five, fifteen and twenty years of data prior and after the tax rate changes. The results do not change materially.

[19] As indicated in Table I, the tax system changes drastically in 1962. The dividend tax rates halves, but dividends are also taxable as part of the global income of shareholders. Additionally, distributed profits are also subject to company taxes (whereas this was not the case prior to 1962). Despite these two additional taxes, Hardewyn (2003) shows that dividends were taxed more heavily under the 1947system than under the 1962 system. Therefore, shifting the dividend to December 1961 leads to a less beneficial tax treatment.

share denomination before World War I, which limited the investing public to the wealthiest families. Social control may therefore have been a mechanism preventing shareholder expropriation. Also, large universal banks, which were affiliated with many listed firms via interlocking directorates, played an important role in the issuance of new securities on the BSE (Deloof et al., 2010). This may have created a reputation of honesty and reliability, thereby reducing the need for firms to pay high dividends.

Interestingly, Acheson et al. (2016) find that the articles of association of British listed firms in the 19th century afforded investors with just as much protection as provided by modern corporate law. This may also have been the case in Belgium. While a large-scale study of the inclusion of such measures in the articles of association of Belgian firms before World War I is beyond the scope of this paper, for a selection of firms, we examined the articles of association for investor protection measures. We searched for the articles of associations of the 150 companies that enter our sample prior to 1873. These companies are thus incorporated in the era when investor protection was the weakest. Demeur (1859, 1865, 1870, 1874) collects all articles of association of limited liability companies founded in Belgium between Belgium's independence[20] and May 1873, when the Commercial Code was revised drastically. In his work, we find the articles of association for 127 companies. Out of the 127 firms we checked, we find that in 126 firms, the executive and supervising directors had to deposit a fixed number of shares as security to align their interests with the interests of the company. In 120 firms, the number of votes per shareholder at the annual meeting was restricted. For 43 firms, the articles of association included preemptive rights for existing shareholders in case of issuance of new equity. Eight firms also did not allow their directors to be involved in the activities of other companies. Thus, consistent with the findings of Acheson et al. (2016) for British firms, it seems that investor protection in Belgian firms was often better than the legally offered protection.

Finally, it is likely that the perception of good investor protection has changed throughout the years. While investor protection substantially improved over time, compared to other countries Belgian investors might always have considered themselves as weakly protected. For instance, investor protection was always weaker in Belgium than in the UK. Acheson et al. (2016) built a Shareholder Protection Index suitable for historical capital markets, for which the UK company law of 1862 scores 14 (out of 20). We find that the Belgian 1873 Commercial Code scores only 8 (out of 20). Théate (1905) also argued that investor protection in Belgium was (much) weaker compared to neighboring countries, such as the UK, Italy, France and Germany. For instance, in the UK, the law of 1900 obliges companies publicly raising money to disclose a prospectus including detailed information. In Belgium, this requirement is introduced only in 1935. Also in

[20] Demeur (1859) includes only surviving companies founded prior to 1857.

recent decades, investor protection in Belgium is weaker compared to other countries. For instance, based on their Anti- Director Right Index, LLSV (2000) classify Belgium as a weak-protection country whereas the UK is classified as a strong-protection country. Using a more comprehensive shareholder protection index, Martynova and Renneboog (2010) also find a relatively low score for Belgium. If both historical and contemporaneous investors consider themselves as weakly protected, dividends might be equally important in pre-World War I and post-World War II Belgium.

9. Conclusion

This paper investigates how the dividend policy of listed Belgian firms has changed over the period 1838 to 2012. Previous research suggests that agency conflicts, information asymmetry and taxation are important determinants of dividend policy. The severity of these market frictions changed considerably in Belgium between 1838 and 2012. While information asymmetry and agency conflicts were likely to be important before World War I, the gradual introduction of better investor protection over time, for example, introducing and enhancing legislation on publication requirements, should have reduced these problems. Taxation became relevant only in 1920, when dividend taxes were introduced. We expected that the changing importance of the various market frictions would impact dividend policy of listed Belgian firms.

Surprisingly, we find no major changes in dividend policy over the period. Dividend policy is fairly stable over time, except during World War I and World War II, which unsurprisingly had a strong impact on dividend policy. Dividend policy changed in the mid-1980s, but this change seems to have been driven by the changing nature of the firms listed on the BSE.

In summary, notwithstanding the general belief that investor protection and taxation affect dividend policy, we find no evidence that a changing legal environment, affected dividend policy of listed Belgian firms over the study period. This raises the question of why dividend policy did not change. We argue that alternative investor protection mechanisms are available in pre-World War I Belgium and that both historical and contemporaneous shareholders consider themselves as weakly protected. This might explain that dividends are equally important prior to World War I and after World War II.

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Appendix I−A Data sources

Appendix Table I − 1 Data sources This table gives an overview of all different datasources used to consturct the time-series of inflation and short-term interest rate.

Panel A: Inflation	
1838−1920	Michotte (1937) and Van de Velde (1943)
1921−1939	Ministery of Economic Affairs
1940−1946	National Bank of Belgium: combination of official price index (three-quarters) and index of balck market (one quarter)
1947−2012	Ministery of Economic Affairs
Panel B: Short-term interest rate	
1832−1918	Official quotation lists of the Antwerp Stock Exchange (until 1883), Journal du Commerce d'Anvers, L'Avenir, Moniteur des Intérêts Matériels, Het Handelsblad
1919−1940	National Bank of Belgium
1940−1945	Vanheurck (1954)
1945−1957	Baudhuin (1958) and Homer and Sylla (1991)
1957−1991	National Bank of Belgium
1991−2012	De Financieel-Economische Tijd/ De Tijd

Appendix I−B Evolution of dividend policy

Appendix Table I − 2 Evolution of dividend policy This table shows how dividend policy of listed Belgian firms evolves over the period 1838−2012. We subdivide this period into five subperiods: 1838−1913; 1914−1918; 1919−1939; 1940−1945; and 1946−2012. Mean, median and standard deviation are reported for all our dividend measures.

Panel A: Propensity to pay$_{all\ stocks}$						
	1838-2012	1838-1913	1914-1918	1919-1939	1940-1945	1946-2012
Mean	61.09%	63.44%	26.96%	50.90%	46.84%	65.44%
Median	63.30%	65.22%	21.74%	55.85%	49.04%	65.41%
St.Dev	12.04%	10.45%	13.01%	10.88%	13.15%	5.80%
Panel B: Initiate						
	1838-2012	1838-1913	1914-1918	1919-1939	1940-1945	1946-2012
Mean	18.33%	18.80%	8.16%	17.10%	16.95%	19.06%
Median	16.67%	17.03%	6.65%	17.40%	17.40%	16.36%
St.Dev	10.72%	11.63%	3.34%	8.59%	10.68%	10.42%
Panel C: ***Continue***						
	1838-2012	1838-1913	1914-1918	1919-1939	1940-1945	1946-2012
Mean	89.76%	92.38%	65.18%	86.48%	74.43%	91.01%
Median	91.28%	92.91%	73.55%	88.22%	78.13%	91.23%
St.Dev	8.03%	5.75%	17.94%	6.57%	10.81%	3.31%
Panel D: Propensity to pay$_{new\ stocks}$						
	1838-2012	1838-1913	1914-1918	1919-1939	1940-1945	1946-2012
Mean	32.72%	34.50%	5.56%	31.85%	18.84%	33.26%
Median	30.90%	33.33%	0.00%	28.35%	9.90%	30.77%
St.Dev	27.23%	25.13%	9.62%	19.28%	25.53%	32.02%
Panel E: Value-weighted dividend yield						
	1838-2012	1838-1913	1914-1918	1919-1939	1940-1945	1946-2012
Mean	3.97%	4.35%	1.75%	3.74%	1.63%	3.99%
Median	4.06%	4.29%	1.48%	3.62%	1.07%	3.82%
St.Dev	1.31%	0.86%	1.01%	0.77%	1.72%	1.46%

Appendix I−C Structural break analysis

Appendix Table I − 3 and Appendix Table I − 4 report the outputs for the structural break analysis. Let us discuss the interpretation for value-weighted dividend yield (Panel E). The interpretation for the other variables is analogous. In the first part of each panel, the model is specified. Following Bai and Perron (1998, 2003) the structural break analysis estimates a multiple linear regression model with M breaks of the form $y_t = x_t'\beta + z_t'\delta_j + u_t$: z_t is a (q x 1) vector of covariates, which consists of ones, and x_t is a matrix of regressors with fixed coefficients across regimes; $p = 0$ (there are no independent variables without structural breaks in the model, i.e., x is not included in the model) and $q = 1$ (there is one independent variable with structural breaks). In each period, at least 26 observations ($h = 26$) are included. We allow for a maximum of five structural breaks ($M = 5$). In the second part of the panel, four different types of test are conducted to test whether there are structural breaks in the data. The first test is the SupF-test of zero breaks versus a fixed number of breaks (going from one to five breaks, as specified above). For dividend yield, the SupF-test of three breaks, as well as the SupF-tests of four and five breaks are significant, leading to the conjecture that structural breaks are present. The second test is the SupF-test of l+1 breaks given the presence of l breaks. Here, neither of these tests is significant at the 10% level. Finally, the so-called unweighted maximization test (UDmax-test) and the weighted maximization test (WD-max test) are performed. These test are both significant at the 1% level. Since three of the four tests reject the null hypothesis of no structural breaks, dividend yield changes considerably. In the third part of the panel, the number of breaks is selected. Here, there are three different procedures: the sequential procedure, the modified Schwarz criterion of Liu et al. 1997 (LWZ) and the Bayesian Information Criterion (BIC). The first procedure finds no breaks, whereas LWZ and BIC both find three breaks in the data. In the last part of each panel, parameter estimates ($\widehat{\delta_1}, \widehat{\delta_2}, \widehat{\delta_3}$ and $\widehat{\delta_4}$) and their standard errors (in parentheses) are shown, as well as estimations for when there are breaks in the data ($\widehat{T_1}, \widehat{T_2}$ and $\widehat{T_3}$).

Appendix Table I − 3 Entire output structural break analysis

Panel A: Propensity to pay$_{all\ stocks}$

Specifications				
z_t = (1)	q = 1	p = 0	h = 26	M = 5
Tests				
$SupF_T(1)$	$SupF_T(2)$	$SupF_T(3)$	$SupF_T(4)$	$SupF_T(5)$
1.36	2.33	1.73	1.38	1.36
$SupF_T(2\|1)$	$SupF_T(3\|2)$	$SupF_T(4\|3)$	$SupF_T(5\|4)$	
2.84	0.56	0.16	0	
UDmax	WDmax			
2.33	2.33			
Number of breaks selected				
Sequential procedure		0		
LWZ		2		
BIC		2		
No breaks selected				

Panel B: Initiate

Specifications				
z_t = (1)	q = 1	p = 0	h = 26	M = 5
Tests				
$SupF_T(1)$	$SupF_T(2)$	$SupF_T(3)$	$SupF_T(4)$	$SupF_T(5)$
4.06	4.79	3.86	4.88	4.23**
$SupF_T(2\|1)$	$SupF_T(3\|2)$	$SupF_T(4\|3)$	$SupF_T(5\|4)$	
4.96	1.33	1.86	0.38	
UDmax	WDmax			
4.88	4.88			
Number of breaks selected				
Sequential procedure		0		
LWZ		0		
BIC		0		
No breaks selected				

Panel C: Continue

Specifications				
z_t = (1)	q = 1	p = 0	h = 26	M = 5
Tests				
$SupF_T(1)$	$SupF_T(2)$	$SupF_T(3)$	$SupF_T(4)$	$SupF_T(5)$
7.81*	4.33	5.59*	5.80**	3.52*
$SupF_T(2\|1)$	$SupF_T(3\|2)$	$SupF_T(4\|3)$	$SupF_T(5\|4)$	
6.21	5.05	3.79	0	
UDmax	WDmax			
7.81*	7.81*			
Number of breaks selected				
Sequential procedure		2		
LWZ		2		
BIC		1		
Estimates with two breaks				
$\widehat{\delta_1}$	$\widehat{\delta_2}$	$\widehat{\delta_3}$		
0.9238	0.8089	0.9101		
(0.0079)	(0.0121)	(0.0084)		
$\widehat{T_1}$	$\widehat{T_2}$			
1913	1945			

Panel D: Propensity to pay$_{new\ stocks}$

Specifications				
z_t = (1)	q = 1	p = 0	h = 23	M = 5
Tests				
SupF$_T$(1)	SupF$_T$(2)	SupF$_T$(3)	SupF$_T$(4)	SupF$_T$(5)
15.83***	10.24***	7.17**	6.03**	4.86**
SupF$_T$(2|1)	SupF$_T$(3|2)	SupF$_T$(4|3)	SupF$_T$(5|4)	
2.59	3.91	0.71	0.002	
UDmax	WDmax			
15.83***	15.83***			
Number of breaks selected				
Sequential procedure		1		
LWZ		0		
BIC		0		
Estimates with one break				
$\widehat{\delta_1}$	$\widehat{\delta_2}$			
0.3587	0.1855			
(0.0237)	(0.0502)			
$\widehat{T_1}$				
1983				

Panel E: Dividend yield

Specifications				
z_t = (1)	q = 1	p = 0	h = 26	M = 5
Tests				
SupF$_T$(1)	SupF$_T$(2)	SupF$_T$(3)	SupF$_T$(4)	SupF$_T$(5)
8.68*	5.94	6.67**	6.93***	4.73**
SupF$_T$(2|1)	SupF$_T$(3|2)	SupF$_T$(4|3)	SupF$_T$(5|4)	
2.06	2.23	0.07	0	
UDmax	WDmax			
8.68*	8.68*			
Number of breaks selected				
Sequential procedure		1		
LWZ		3		
BIC		3		
Estimates with three breaks				
$\widehat{\delta_1}$	$\widehat{\delta_2}$	$\widehat{\delta_3}$	$\widehat{\delta_4}$	
0.0435	0.0298	0.0490	0.0276	
(0.0012)	(0.0018)	(0.0017)	(0.0020)	
$\widehat{T_1}$	$\widehat{T_2}$	$\widehat{T_3}$		
1913	1947	1986		

Appendix Table I − 4 Entire output structural break analysis (no wars included)

Panel A: Propensity to pay$_{all\ stocks}$

Specifications				
z_t = (1)	q = 1	p = 0	h = 25	M = 5
Tests				
$SupF_T(1)$	$SupF_T(2)$	$SupF_T(3)$	$SupF_T(4)$	$SupF_T(5)$
1.48	3.95	3.03	2.38	0.78
$SupF_T(2\|1)$	$SupF_T(3\|2)$	$SupF_T(4\|3)$	$SupF_T(5\|4)$	
4.20	0.83	0.24	0	
UDmax	WDmax			
3.95	3.95			
Number of breaks selected				
Sequential procedure		0		
LWZ		0		
BIC		3		
No breaks selected				

Panel B: Initiate

Specifications				
z_t = (1)	q = 1	p = 0	h = 25	M = 5
Tests				
$SupF_T(1)$	$SupF_T(2)$	$SupF_T(3)$	$SupF_T(4)$	$SupF_T(5)$
4.74	4.62	3.64	5.18*	4.68**
$SupF_T(2\|1)$	$SupF_T(3\|2)$	$SupF_T(4\|3)$	$SupF_T(5\|4)$	
4.09	1.09	3.46	0	
UDmax	WDmax			
5.18	5.18			
Number of breaks selected				
Sequential procedure		0		
LWZ		0		
BIC		0		
No breaks selected				

Panel C: Continue

Specifications				
z_t = (1)	q = 1	p = 0	h = 25	M = 5
Tests				
$SupF_T(1)$	$SupF_T(2)$	$SupF_T(3)$	$SupF_T(4)$	$SupF_T(5)$
12.01**	6.72*	4.51	4.87*	3.65*
$SupF_T(2\|1)$	$SupF_T(3\|2)$	$SupF_T(4\|3)$	$SupF_T(5\|4)$	
4.70	2.43	5.43	0	
UDmax	WDmax			
12.01**	12.01**			
Number of breaks selected				
Sequential procedure		1		
LWZ		0		
BIC		1		
Estimates with one break				
$\widehat{\delta_1}$	$\widehat{\delta_2}$			
0.9455	0.9035			
(0.0097)	(0.0044)			
$\widehat{T_1}$				
1865				

Panel D: Propensity to pay$_{new\ stocks}$

Specifications				
z_t = (1)	q = 1	p = 0	h = 22	M = 5
Tests				
$SupF_T(1)$	$SupF_T(2)$	$SupF_T(3)$	$SupF_T(4)$	$SupF_T(5)$
18.75**	11.480***	7.99***	6.55***	4.79**
$SupF_T(2\|1)$	$SupF_T(3\|2)$	$SupF_T(4\|3)$	$SupF_T(5\|4)$	
6.12	1.85	0.87	0	
UDmax	WDmax			
18.75***	18.75***			
Number of breaks selected				
Sequential procedure		1		
LWZ		0		
BIC		1		
Estimates with one break				
$\widehat{\delta_1}$	$\widehat{\delta_2}$			
0.3721	0.1855			
(0.0242)	(0.0499)			
$\widehat{T_1}$				
1983				

Panel E: Dividend yield

Specifications				
z_t = (1)	q = 1	p = 0	h = 25	M = 5
Tests				
$SupF_T(1)$	$SupF_T(2)$	$SupF_T(3)$	$SupF_T(4)$	$SupF_T(5)$
16.69***	9.39***	6.77**	7.34***	5.84***
$SupF_T(2\|1)$	$SupF_T(3\|2)$	$SupF_T(4\|3)$	$SupF_T(5\|4)$	
1.88	2.79	0.04	1.31	
UDmax	WDmax			
16.69***	16.69***			
Number of breaks selected				
Sequential procedure		1		
LWZ		2		
BIC		2		
Estimates with one break				
$\widehat{\delta_1}$	$\widehat{\delta_2}$			
0.0438	0.0276			
($8.4777e^{-4}$)	(0.0020)			
$\widehat{T_1}$				
1986				

Chapter II. Why do firms pay dividends? 175 years of evidence[*]

ABSTRACT

We investigate the determinants of dividends, using a unique sample of all Belgian and colonial firms listed on the Brussels Stock Exchange between 1838 and 2012. We find the characteristics of dividend payers to be stable in different institutional settings, in different states of the economy and in different stages of the industry life-cycle. Large firms, firms with a lower level of idiosyncratic risk, firms with a high share denomination and more liquid firms are more likely to pay dividends. Moreover, firms with a lower level of idiosyncratic risk are more likely to smooth their dividends. Further, we find that the majority of dividends is paid by the minority of firms. Our evidence raises doubt about signaling as a first order determinant of dividend policy. The fact that larger firms are more likely to pay and that the majority of dividends is paid by a minority of large firms indicates that life-cycle considerations have an important impact on the firm's dividend policy. Further, we find no evidence in line with the home-made dividend preposition, catering theory or prospect theory.

Keywords: Dividend policy, Financial history, Belgium, Long-run evidence, Life-cycle, Signaling, Dividend concentration

[*] This paper is co-authored by Jan Annaert (University of Antwerp and Antwerp Management School) and Marc Deloof (University of Antwerp and Antwerp Management School).

1. Introduction

An important question in the corporate finance literature is: Why do firms pay dividends? In a world without market frictions, dividends do not matter (Miller and Modigliani, 1961). However, once dividends are taxed more heavily than capital gains, the optimal strategy is to pay no dividends (Brennan, 1970; Farrar and Selwyn, 1967). But still, dividends do exist. Many studies have proposed and tested several theories of why firms pay dividends (see DeAngelo et al. (2009) for a literature review), but the dividend puzzle remains unresolved. We extend the literature on the reasons why firms pay dividends by examining the determinants of dividend policy in Belgium between 1838 and 2012. Specifically, we investigate which firm characteristics affect the decision to pay dividends. For a subsample of firms, we also investigate whether the same characteristics affect the dividend smoothing behavior of companies. Additionally, we also investigate whether dividends are concentrated among a small set of large firms. Our study provides further evidence on signaling, life-cycle considerations, home-made dividends, catering theory and prospect theory.

Investigating the determinants of the decision to pay in the long run allows us to explore whether this decision is affected by the environment in which firms operate. It is likely that managers have different reasons to pay dividends depending on (1) the institutional settings, (2) the state of the economy or (3) the maturity of the industry in which the firm is active. For instance, in historical capital markets, dividends are often the only source of reliable information to investors, as financial statements were not publicly available, and if they were, their quality was questionable (Van Overfelt et al., 2010). Therefore, the signaling role of dividends is likely to be important. Studies based on historical data indeed find evidence in line with signaling (e.g. Braggion and Moore, 2011; Turner et al., 2013), whereas studies based on contemporary data often find that life-cycle considerations are the most important drivers of a firm's decision to pay dividends (e.g. DeAngelo et al., 2006; Denis and Osobov, 2008; Fama and French, 2001; von Eije and Megginson, 2008). Similarly, the motives to pay dividends might depend on the economic settings. During times of economic downturn, the costs and probability of financial distress generally increase, which increases the signaling value of dividends. As such, the signaling motive is likely to be stronger during economic recessions. Fuller and Goldstein (2011) indeed find that payers outperform nonpayers more in declining markets than in advancing markets, but they do not investigate whether the motives to pay dividends are similar in different states of the economy. Likewise, the industry maturity can also affect the reasons why firms pay dividends. Investment opportunities and information asymmetry are partly industry-specific (e.g. Baker, 1988; Dempsey et al., 1993; Leary and Michaely, 2011; Michel, 1979), and vary over the life-cycle of the industry. In young industries, investment opportunities are abundant and information asymmetry is large. As such, the signaling role of dividends is important. In mature industries, investment opportunities vanish. Life-cycle considerations are then probably the main driver of dividend policy.

We contribute to the literature in the following ways. First, while there is plenty of evidence on the determinants of the decision to pay dividends (e.g. DeAngelo et al., 2006; Denis and Osobov, 2008; Fama and French, 2001; von Eije and Megginson, 2008) and on the determinants of smoothing behavior (Leary and Michaely, 2011), it is an open question whether the determinants of dividend policy are the same in different settings. Although Denis and Osobov (2008) and von Eije and Megginson (2008) find similar determinants of the dividend decision in different countries, there is no evidence of common determinants of the decision to pay in different economic regimes nor whether the determinants of dividends depend on the maturity of the industry. Our long-term analysis is able to fill this gap in the literature. Second, we extend the evidence that the majority of dividends is paid by a minority of large firms (e.g. DeAngelo et al., 2004) by almost one century. Moreover, by showing that dividends are concentrated in the hands of a minority of large firms, we offer a comprehensive explanation to why dividend policy is found not to be driven by changes in the level of investor protection and taxation (Bank et al., 2009; Chapter I of this dissertation)[1]. Although it is generally believed that the institutional environment affect dividend policy, both studies fail to explain the absent link between investor protection and taxation on the one hand, and dividend policy on the other hand. Although Chapter I of this dissertation gives some explanations of why dividends are stable[2], there is no explanation for why taxation seems to have no impact on the decision to pay dividends, and the explanation of the apparent absence of a link between the dividend policy and the legal level of investor protection is only partial. However, our analysis of dividend concentration shows that dividend policy is not affected by an economy-wide phenomenon, such as a change in the taxation system or a change in the legal level of investor protection. Finally, given that we do not find evidence in line with catering theory, we contribute to the growing literature that fails to support this theory (e.g. DeAngelo et al., 2004; Denis and Osobov, 2008; Hoberg and Prabhala, 2009; Turner et al., 2013)

Our evidence reveals common determinants of dividend policy in different institutional settings, during economic expansion and economic recession and during different stages of the industry life-cycle. We find larger firms, firms with a lower level of idiosyncratic risk, firms with a higher share denomination and more liquid firms are more likely to pay dividends. Additionally, firms with a lower level of idiosyncratic risk are more likely to smooth their dividends. Overall, these results cast doubt about signaling as a first-order

[1] Bank et al. (2009) investigate the evolution of dividend policy in the UK in the post-World War II period. In the first chapter of this dissertation, we investigate the evolution of dividend policy in Belgium between 1838 and 2012. Despite huge changes in the institutional environment, both studies find that dividend policy is remarkably stable. As such, dividend policy seems not to be driven by the institutional environment in which firms operate.

[2] The first chapter of this dissertation argues that investor protection in the period before World War I might be far better than legally provided. First, they argue that in the period before World War I, the investor public is limited to the wealthiest families. As such, social control might serve as an investor protection mechanism. Second, in the period before World War I, universal banks might have played an important monitoring role, which decreased the need for dividends. Third, they find that companies voluntarily adopted investor protection mechanisms

determinant of dividends. Firms with more idiosyncratic risk are typically more opaque and therefore, these firms should be more likely to pay and more likely to smooth their dividends. However, we find the opposite to be true. Additionally, larger firms, which typically face less problems of asymmetric information, are more likely to pay dividends. This raises further doubt about signaling as a first-order determinant of dividend policy and indicates that life-cycle considerations are likely to be an important driver of the decision to pay dividends.

Further, we find the majority of dividends is distributed by a minority of large firms. Additionally, this dividend concentration increases over time. The proportion of the market capitalization represented by this 20% largest dividend payers also increases over time. Our finding of dividend concentration raises further doubt about signaling as a first-order determinant of dividend policy. Indeed, if managers use dividends to give a signal about their future prospects, dividends would not be concentrated in the hand of large, well-known firms but would predominantly be paid by small firms. At the same time, the finding of dividend concentration strengthens the likelihood that dividends are paid because of life-cycle arguments.

The finding of dividend concentration also casts doubt about catering theory and prospect theory as first-order determinants of dividend policy. According to catering theory, managers set their dividend policy depending on investor's demand for dividends. If demand for dividends is high, managers are more inclined to pay dividends, whereas the opposite is true if dividend demand is low (Baker and Wurgler, 2004a). It is rather unlikely that investor's demand for dividends is limited to the largest dividend paying firms. Our results indeed fail to find evidence in line with catering theory. According to prospect theory, investors underweight probable outcomes (e.g. capital gains) relative to certain outcomes (e.g. dividends) (Kahneman and Tversky, 1979). Again, it is unlikely that prospect theory holds as the investor's preference for certain dividends is very likely not limited to the minority of large firms. In line with this argument, our results indeed find no evidence that prospect theory holds in our sample.

The paper proceeds as follows. In Section 2, we describe the institutional settings. Section 3 describes the data. In Section 4, we examine which firm characteristics affect the decision to pay dividends. Section 5 explores the relationship between the firm characteristics and the firm's smoothing behavior. In Section 6, we focus on dividend concentration and Section 7 is devoted to the catering theory and prospect theory. Finally, Section 8 concludes.

2. The Belgian environment

During our sample period, the environment in which Belgian firms operate, changes drastically. In the beginning of our sample period, investor protection was weak, both relative to historical standards as to present-day standards. Government approval was required to incorporate a limited liability company, but apart from this incorporation requirement, there was virtually no legislation to protect investors. There were, for instance, no publication requirements, the general meeting was only open for large shareholders and there was no obligation to have a board of directors (Théate, 1905). Over time, investor protection improved. As of 1873, companies were legally obliged to publish a balance sheet, having a board of director was mandatory and the general meeting was open for all shareholders. The maximum number of votes per shareholder was limited to 20% of the outstanding shares or to 40% of the shares represented at the General Meeting (Guillery, 1886). In 1913, the content of the balance sheet was determined to limited extent (Wauwermans, 1914). However, legal enforcement was weak and laws were easily circumvented. For instance, although it was legally obliged that firms publish financial statements, on average only 60% of the companies complies with this regulation in the period between 1873 and 1913 (Frère, 1951). Also, by issuing multiple voting shares, companies easily circumvented the limitation of the number of votes imposed by the 1873 Commercial Code (Willems, 2000). After World War I, the institutional environment changed further. Multiple voting shares were abolished in 1934 (Willems, 2000). Additionally, universal banks, which were very important for the development of the Belgian economy in the pre-World War I period, were forced to split up in commercial banks and holding companies (1934) and the Banking Commission, which was responsible for the oversight of security issues and the supervision of Belgian banks, was established in 1935. Moreover, dividend taxation is introduced in 1920. Also after World War II, investor protection improves further. From 1953 onwards, an external audit of the financial statements of listed companies is required (Centre d'étude des Sociétés, 1956). To increase the financial transparency, the content and layout of the financial statements was further specified in 1975 (Van Damme, 1983). Further, insider trading was abolished and new regulation regarding takeover bids was introduced in the late 1980s (Geens, 1990; Hendrickx and Van gulck, 1991). As investor protection improved over time, the signaling role and monitoring role of dividends are likely to change over time. Moreover, given the introduction of dividend taxes, dividends become less attractive.

Apart from these huge changes in the institutional environment, Belgium was also involved in a war twice and several major crises hit the Belgian economy (e.g. the Great Depression (1929), the Oil Crises of the 1970s and more recently the Great Recession). Additionally, the industry composition of Belgian firms changed drastically over time. Annaert et al. (2011) describe industries that are important on the Brussels Stock Exchange between 1833 and 2005. In their spirit, we divide firms into the following industries:

Financials (banks and holding companies), Transport (Railways and Trams), Steel and non-ferrous metal, Coal mining and Chemicals, Electricity & Oil. Firms that are not active in these industries are in the category 'Other'. This category includes a diverse set of industries (e.g. water, food, breweries, textile companies). As is already documented by Annaert et al. (2011), the dominant industries change over our sample period. Notwithstanding the UK and US market were dominated by railway companies before World War I (Dimson and Chambers, 2016), Belgium had already a very diversified stock market. At the start of our sample period, the BSE is dominated by the financial sector. However, starting in the 1860s, the railway companies gain importance. As Belgium was one of the biggest coal-producing countries, the coalmine industry was also well-represented at the BSE, and continued to do so until shortly after World War I. In the Interbellum, the Chemicals, Oil & Electricity industry, a relatively new industry became the most important industry, and the financial industry became again more important. At the same time, the transport sector lost importance. More recently, the Chemicals, Oil & Electricity industry and the financial industry are the most important industries of the BSE. The importance of the signaling role and monitoring role of dividends likely depends on the state of the economy. For instance, during times of economic downturn, the signaling value of dividends is higher as the costs of financial distress typically increase. Additionally, the monitoring role and signaling role of dividends might change over the life-cycle of an industry. Investment opportunities and the level of information asymmetry are partly industry-specific (e.g. Baker, 1988; Dempsey et al., 1993; Leary and Michaely, 2011; Michel, 1979) and vary over the maturity of the industry. As such, given the fact that Belgium is hit by several crises and given the changing industry composition of the firms listed on the BSE, the determinants of dividend policy are likely to change over time.

3. Data and variable description

3.1 Database

The database of the Studiecentrum voor Onderneming en Beurs (SCOB) at the University of Antwerp is our main data source. It includes information on all stocks ever listed on the Brussels Stock Exchange (BSE) since 1824. As few stocks were listed on the BSE at this point in time, we only start our sample period in 1838. We collect data on end-of month stock prices, dividend information (amount of dividend paid, ex-dividend day) and on the number of stocks listed on the BSE. There are 2,025 unique common stocks issued by 1,777 firms listed on the BSE since 1838, yielding to 57,632 stock-year combinations. Only firms that are listed for at least twelve months are considered. Foreign companies are not included in our sample

We include stock *i* in year *t* in our sample if following conditions are fulfilled: First, there are 1,254 firms with two stocks, and 127 firms with three stocks listed simultaneously. For those firms, we only include the stock with the largest market capitalization. We thus lose 1,508 stock-year observations, yielding to a sample

of 1,777 firms with 56,124 firm-year combinations. Second, we require that for each firm in each year, there is at least one month with a non-zero price return. By imposing this restriction, we guarantee a minimum liquidity and we exclude listed firms that are de facto private firms. We delete 2,405 firm-year observations for which the price of firm *i* does not change in year *t*. Of these observations, 28 observations belong to seven firms from which the price-return is zero during their entire listing period. The majority of the limited-liquidity observations originates thus from firms that are only temporarily illiquid. Finally, during both world wars, the firm's dividend decision was restricted by legislation imposed by the German occupier (e.g. Deswarte, 1942). As the dividend decision was thus not freely made, we exclude observations during World War I (1914−1918) and World War II (1940−1945) from our sample period. The final sample thus consists of 1,769 firms for which we have 48,879 firm-year observations.

Additionally, we also collect inflation data. For the period between 1838−1920, these data are from Michotte (1937) and Van de Velde (1943). For the period between 1921 and 1939 and as of 1947, CPI data are retrieved from the Ministery of Economic Affairs.

3.2 Variable description

We include several firm characteristics in our analysis. First, we use size and age as a proxy for maturity. According to life-cycle theory, mature firms are typically in a stage of their lifecycle where the pile of cash increases and investment opportunities vanish. As such, mature firms typically have more free cash flow, and therefore, mature firms are more inclined to pay (DeAngelo et al., 2006; Grullon et al., 2002). Size is measured as the firm's market capitalization at the end of year *t* and age is calculated as the number of years since the firm's incorporation. In order to neutralize the effect of the increase in age and size over time, we follow Fama and French (2001) and transform these variables into percentile variables. As such, size (age) is measured as the percentile of BSE firms with the same or lower size (age) at a given point in time.

Next, we also include a firm's idiosyncratic risk as a measure of stock return volatility. If managers use dividends as a signal to resolve asymmetric information, as is argued by adherents of the signaling theory of dividends (Bhattacharya, 1979; John and Williams, 1985; Miller and Rock, 1985), typically firms with more idiosyncratic risk, should benefit more from paying dividends (e.g. Lee and Mauck, 2016). For each stock, we regress the firm's stock return on the total market return using monthly return data of the previous sixty months. Firm-specific risk at the end of year *t* is then calculated as the standard deviation of the residuals of this market model. This measure of firm-specific risk is similar to Hoberg and Prabhala (2009) and Lee and Mauck (2016).To take into account the variation in the level of idiosyncratic risk over time, we also measure idiosyncratic risk as the percentile of BSE firms with the same or lower level of idiosyncratic risk.

As the share denomination of a stock was an important firm characteristic in historical capital markets, we further include the share denomination as potential determinants of the decision to pay dividends. For instance, in the 19th century UK, firms aimed at a high share denomination because it was believed that this attracts buy-and-hold investors and would frighten speculative investors. As such, having a stable investor basis was believed to be beneficial for the company's stability (Jefferys, 1946). Although the main focus of prior research on this topic is on the UK (e.g. Jefferys, 1946; Turner et al., 2013), these arguments in favor of high share denomination are also valid in the Belgian context. Paying dividends might also help firms to attract these buy-and-hold investors. We follow Turner et al. (2013) and Burkart et al. (2017) and measure the share denomination of firms using their end-of-year share price. Similar as before, we measure share denomination as the percentile of BSE firms with the same or a lower share price at a given point in time.

Next, we also include a measure of liquidity. In the Miller and Modigliani (1961) world, investors can easily create a home-made dividend by selling of part of their shares if they believe that the dividend paid is too low. However, in the real-world trading frictions occur and thus investors of less liquid firms face higher costs in creating this home-made dividend. Therefore, a stock's liquidity is likely to affect a firm's decision to pay dividends (e.g. Banerjee et al., 2007). We use the occurrence of non-zero return months as proxy for liquidity. Rather than taking the percentage of daily non-zero returns (Bekaert et al., 2007; Lesmond, 2005; Lesmond et al., 1999), we count the number of months in year *t* in which the price return is different from zero.

Finally, we will also investigate differences in dividend policy across different industries. In the spirit of Annaert et al. (2011), we divide firms into the following industries: Financials (banks and holding companies), Transport (Railways and Trams), Steel and non-ferrous metal, Coal mining and Chemicals, Electricity & Oil. Firms that are not active in these industries are in the category 'Other'. This category includes a diverse set of industries (e.g. water, food, breweries, textile companies).

Measuring firm characteristics relying on stock market data has an important advantage: we are able to measure each of our variables in a consistent way over time, which is impossible with variables using accounting data. Take for instance the earned-to-contributed capital ratio (an important dividend determinant) (DeAngelo et al., 2006), which is calculated as the ratio of retained earnings to total equity. It is very hard, not to say impossible, to calculate this variable in a reliable and consistent way over our entire sample period for several reasons. First, there is no legal obligation to publish a balance sheet before 1873[3].

[3] As from 1841, companies were obliged to disclose their balance sheet to their shareholders. As such, the financial information of a company was not widely available for the entire investor public (Demeur, 1859).

Second, although there is a publication requirement as of 1873, there is (1) no legislation concerning the precise content of the balance sheet (Théate, 1905) and (2) legal enforcement is very weak as on average only 60% of the companies published their balance sheet in the period between 1873 and 1913 (Frère, 1951). Given the absence of legislation on the precise content of the balance sheet, firms published whatever they want. To enhance the comparability across firms, the Receuil Financier transforms all balance sheets in a uniform standard. However, notwithstanding the transformation of balance sheets, there is a huge difference in the amount of information published across firms (Van Overfelt et al., 2010). As of 1913, the legislator specifies the minimal amount of information that should be included on the balance sheet. While companies are obliged to include their total capital, it is not legally required to have a category 'retained earnings' (Wauwermans, 1914). Only in 1975, when modern accounting standards are introduced, companies are legally obliged to report their retained earnings (e.g. 't Kint, 1985; Van Damme, 1983). Finally, as balance sheets are not audited before 1953 (Centre d'étude des Sociétés, 1956), the reliability of accounting data in most of our sample period is questionable. The huge changes in accounting standards over our sample period introduces measurement problems. Therefore, it is impossible to consistently calculate firm characteristics using accounting data throughout the entire sample period. By calculating firm characteristics using stock return data, we avoid these issues.

3.3 Descriptive statistics

Table II − 1 reports descriptive statistics of our different firm characteristics. We focus on three distinctive periods: the period before World War I (1838−1913), the Interbellum (1919−1939) and the post-World War II era (1946−2012). We adjust size and share denomination for inflation so that the reported values are comparable throughout our sample period. Size and share denomination are expressed in 1980 BEF. Before World War I, the mean (median) firm in our sample period has a market capitalization of 769.72 (317.12) million BEF. During the Interbellum, the market capitalization is lower compared to before World War I. The mean (median) market capitalization in the interwar period amounts to 597.34 (140.05) million BEF. In the post-World War II period, the mean size of firms increases tremendously. The average post-World War II market capitalization is equal to 3,847.35 million BEF. However, the median market capitalization after World War II is only equal to 199.53 million BEF. As such, when comparing the medians over time, the median firm in the post-World War II era is smaller in real terms relative to the pre-World War I era. The fact that the size of the median firm is only a fraction of the size of the average firm indicates that there are some very large firms in our sample post-World War II. With respect to age, we find a steady increase in both the mean and the median age. In the period before World War I, the mean (median) company is 19.58 (15.00) years old. During the Interbellum, this mean (median) age has increased to 30.03 (26.00) years and after World War II, the mean (median) firm age is equal to 57.33 (54.00) years. For idiosyncratic risk, we find a mean (median) level of 6.45% (5.31%) before World War I. During the Interbellum, the mean

(median) level of idiosyncratic risk increases to 10.49% (9.47%). After World War II, the mean (median) level of idiosyncratic risk decreases again to 6.94% (6.47%). For share denomination, we find the mean (median) level to be the highest in the pre-World War I era. The mean (median) share price was then equal to 63,743.81 BEF (39,795.16 BEF). During the Interbellum, the mean (median) share price dropped to 16,096.37 BEF (6,037.92 BEF) and after World War II, the mean (median) share price decreased further to 5,241.58 BEF (2,176.24 BEF). Finally, the mean (median) level of liquidity increased over time. Before World War I, a firm traded on average 8.88 months a year (median: 10 months), during the Interbellum, the mean (median) liquidity was equal to 10.22 (11) trading months per year. After World War II, firms traded on average 11.06 months per year (median: 12 months).

Table II − 1 Firm characteristics This table reports the mean and median of the firm characteristics included in our sample. Size is measured as the market capitalization at the end of year *t* and is adjusted for inflation. Age is calculated as the number of years since a firm's incorporation. Idiosyncratic risk is calculated as the standard deviation of the residual of the market model, estimated using return data of the previous sixty months. Share denomination is measured by the firm's share price at the end of year *t*. Share denomination is also adjusted for inflation. Finally, liquidity is measured as the number of non-zero return months in year *t*.

	Before World War I	**Interbellum**	**Post World War II**
Size (in 1980 BEF)	769.72	597.34	3,847.35
	(317.12)	(140.05)	(199.53)
Age (in years)	19.58	30.03	57.33
	(15.00)	(26.00)	(54.00)
Idiosyncratic risk (in %)	6.45	10.49	6.94
	(5.31)	(9.47)	(6.47)
Share denomination (in 1980	63,743.81	16,096.37	5,241.58
BEF)	(39,795.16)	(6,037.92)	(2176.24)
Liquidity (in months)	8.88	10.22	11.06
	(10.00)	(11.00)	(12.00)

Next, we report the evolution of the mean and median value of each characteristic in Figure II − 1. Similar as before, we adjust the values of size and share denomination for inflation. Moreover, for size (Panel A), we report two graphs, as the market capitalization increases strongly in the most recent decades. Over time, the mean market capitalization tends to increase. This is especially the case in the post-World War II period. As can be seen from Panel A2, the mean market capitalization increases strongly as from 1985. For age (Panel B), we find a steady increase of both the average and median value over time. From Panel C, we infer that the level of idiosyncratic risk is comparable in the period before World War I and the period after World War II. During the Interbellum, the level of idiosyncratic risk is far higher. Next, we find a huge decrease in the real share denomination (Panel D). Share denomination is the highest in the first decades of our sample and decreases steadily over time. Finally, for liquidity (Panel E), the opposite is true. Whereas the liquidity was very low at the beginning of our sample period, it increased over time. After World War II, the mean (median) level of liquidity is rather stable. This is especially the case in the post-World War II period. As can be seen from Panel A2, the mean market capitalization increases strongly as of 1985. For age (Panel B), we find a steady increase of both the average and median value over time. From

Panel C, we infer that the level of idiosyncratic risk is comparable in the period before World War I and the period after World War II. During the Interbellum, the level of idiosyncratic risk is far higher. Next, we find a huge decrease in the real share denomination (Panel D). Share denomination is the highest in the first decades of our sample and decreases steadily over time. Finally, for liquidity (Panel E), the opposite is true. Whereas the liquidity was very low at the beginning of our sample period, it increased over time. After World War II, the mean (median) level of liquidity is rather stable.

Table II − 2 reports the average characteristic for firms in different industries for our different subperiods. Before World War I (Panel A), there are 94 Financials, 170 Transport companies, 189 firms in the Steel & Non-ferrous industry, 148 coal mining companies, 80 firms belong to the Chemicals, Electricity & Oil industry, and 313 are classified as others. Financials are on average the most likely to pay dividends (78.87%), followed by Coalmines (73.58%) and Transport companies (70.89%). The dividend yield of Financials is the highest (4.33%), followed by Coalmines (4.28%) and Others (4.11%). Financials are on average also the largest firms, and the firms with the lowest idiosyncratic risk and they rank second in terms of liquidity and share denomination. Firms belonging to Chemicals, Electricity & Oil are on average the firms with the lowest propensity to pay and the lowest dividend yield. Additionally, firms in this industry are on average the smallest, the youngest, have the highest level of idiosyncratic risk and have the lowest share denomination.

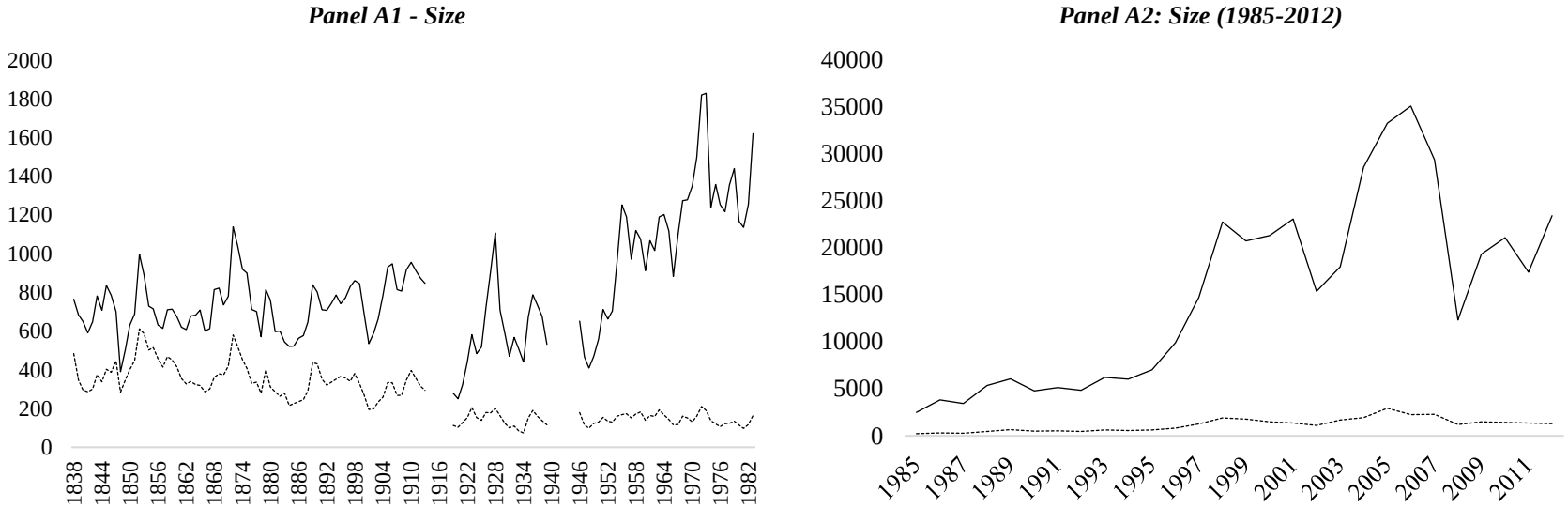
During the Interbellum, a different picture arises. While the importance of Chemicals, Electricity & Oil companies increases on the BSE, Transport companies become less important (Annaert et al., 2011). This is also translated in the firm characteristics by industry. Financials still have the largest propensity to pay (68.32%), followed by Chemicals, Electricity & Oil companies (62.01%) and Coal mines (57.01%). Transport firms, however, face a huge decline in the propensity to pay. Whereas they ranked third in terms of propensity to pay in the period before World War I, they have on average the lowest propensity to pay (41.69%) during the Interbellum. Moreover, only for Chemicals, Electricity & Oil companies the average propensity to pay increases during the Interbellum compared to the pre-World War I period, whereas for all other industries, the average propensity to pay has declined. In terms of average firm size, Financials are on average still the largest firms. Although Chemicals, Electricity and Oil companies were on average the smallest firms in the pre-World War I period, they rank second in terms of average size during the Interbellum. The opposite is true for Steel & Non-ferrous companies. Before World War I, firms in this industry were on average among the largest firms (741.27 million BEF), whereas now, the average size in this industry (450.46 million BEF) is rather low. Over all industries, the average level of idiosyncratic risk increased strongly during the Interbellum compared to before World War I. Financials and Coalmines

still belong to the industry with on average the lowest levels of idiosyncratic risk (9.05% and 9.67% respectively). However, the idiosyncratic risk in the Transport industry increased tremendously (both compared to before World War I, as compared to other industries). The average level of idiosyncratic risk in this industry amounts to 12.30%.

After World War II, Financials and Chemicals, Electricity & Oil companies again dominate the BSE in terms of propensity to pay. In the Financial (Chemicals, Electricity & Oil) industry, on average 78.31% (76.13%) of firms pays a dividend. In terms of market capitalization, firms in these industries are on average the largest (average market capitalization of 8,114.63 million BEF for Financials and 8,174.89 million BEF for Chemicals) and they face the lowest level of idiosyncratic risk (6.50% for Financials and 6.32% for Chemicals, Electricity and Oil companies). Whereas the Transport industry and the Coalmining industry were very dominant before World War I (as well in terms of number of firms in this industry, as in terms of propensity to pay, as in terms of average market capitalization), their dominance has completely disappeared after World War II. Barely 27 firms (59 firms) are active in the Transport industry (Coalmining industry), and their average market capitalization is barely 388.96 million BEF for Transport firms and 311.82 million BEF for Coalmines. In the Transport industry, on average 57.95% of all firms pay a dividend, whereas in the Coal mining industry, this is only 40.61% (compared to on average 66.79% over all firms). However, the dividend yield of these two industries belongs to the highest average dividend yields over all sectors (5.01% for the Transport industry and 4.20% for the Coal mining industry compared to 3.77% on average over all firms).

Finally, Table II − 3 shows the correlation matrix of the different independent variables for our three subperiods (Before World War I, during the Interbellum and after World War II). In all subperiods, size and share denomination have the strongest correlation, ranging from 0.622 before World War I, 0.666 during the Interbellum and 0.576 after World War II. Other correlations are very low. Additionally, all correlations tend to become weaker over time.

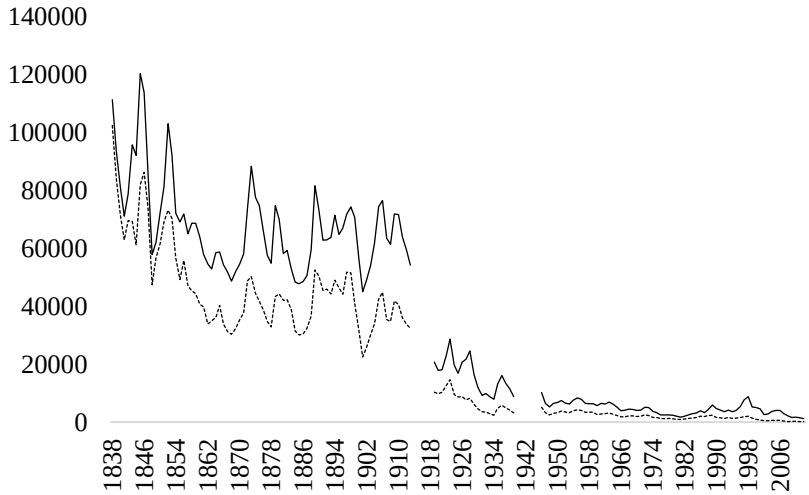
Figure II − 1 Evolution of mean and median firm characteristics, 1838−2012 This figure shows the evolution of the different dividend characteristics over our sample period. Size is measured as the market capitalization at the end of year *t* and is adjusted for inflation. Age is calculated as the number of years since a firm's incorporation. Idiosyncratic risk is calculated as the standard deviation of the residual of the market model, estimated using return data of the previous sixty months. Share denomination is measured by the firm's share price at the end of year *t*. Share denomination is also adjusted for inflation. Finally, liquidity is measured as the number of non-zero return months in year *t*.



Panel B: Age

Panel C: Idiosyncratic risk

Panel D: Share denomination



Panel E: Liquidity

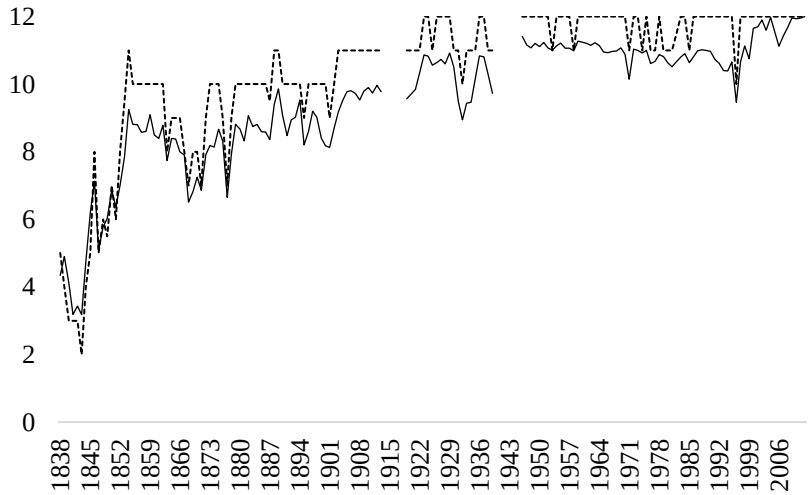


Table II − 2 Average firm characteristic per industry This table shows the average firm characteristics per industry. Size is measured as the market capitalization at the end of year *t* and is adjusted for inflation. Age is calculated as the number of years since a firm's incorporation. Idiosyncratic risk is calculated as the standard deviation of the residual of the market model, estimated using return data of the previous sixty months. Share denomination is measured by the firm's share price at the end of year *t*. Share denomination is also adjusted for inflation. Finally, liquidity is measured as the number of non-zero return months in year *t*. We also report the average propensity to pay per industry and the (equally-weighted) dividend yield.

Panel A: Before World War I						
	Financials	Transport	Steel	Coal	Chemicals	Other
Number of firms	94	170	189	148	80	313
Propensity to pay (in %)	78.87	70.89	62.23	73.58	60.03	64.99
Dividend yield (in %)	4.33	3.36	3.53	4.28	3.35	4.11
Size (in mil. 1980 BEF)	1,923.72	787.62	741.27	670.98	317.81	501.05
Age (in years)	19.16	17.88	20.59	24.94	11.56	17.25
Idiosyncratic risk (in %)	4.86	5.83	6.69	6.37	8.59	7.06
Share denom. (in 1980 BEF)	70,620.88	35,902.39	67,141.90	98,694.89	33,852.22	55,271.79
Liquidity (in months)	9.14	8.97	9.14	9.72	8.50	7.92
Panel B: Interbellum						
	Financials	Transport	Steel	Coal	Chemicals	Other
Number of firms	120	113	165	106	110	463
Propensity to pay (in %)	63.82	41.69	46.65	57.01	62.01	53.28
Dividend yield (in %)	3.33	2.29	2.73	3.45	3.05	3.15
Size (in mil. 1980 BEF)	1,869.98	464.90	450.46	468.92	600.04	433.99
Age (in years)	29.45	35.20	32.75	45.83	22.25	26.60
Idiosyncratic risk (in %)	9.05	12.30	10.85	9.67	10.48	10.42
Share denom. (in 1980 BEF)	21,937.86	6,158.37	14,081.36	33,449.66	12,421.03	14,400.17
Liquidity (in months)	10.39	9.78	10.14	11.02	10.45	10.06
Panel C: After World War II						
	Financials	Transport	Steel	Coal	Chemicals	Other
Number of firms	163	27	108	59	101	434
Propensity to pay (in %)	78.31	57.95	63.95	40.61	76.13	65.41
Dividend yield (in %)	4.44	5.01	3.44	4.20	3.88	3.42
Size (in mil. 1980 BEF)	8,114.63	388.96	1,397.86	311.82	8,174.89	2,442.83
Age (in years)	59.11	62.38	64.72	77.88	50.13	52.36
Idiosyncratic risk (in %)	6.50	7.55	6.75	7.95	6.32	7.12
Share denom. (in 1980 BEF)	5,203.51	1,945.00	5,391.78	8,663.74	3,676.60	5,169.08
Liquidity (in months)	11.17	10.75	11.13	11.18	11.23	10.94

Table II − 3 Correlation matrix This table shows the correlation matrix of our different independent variables. Age is measured as the number of years since incorporation. Size is measured as the market capitalization of the firm at the end of the year. Idiosyncratic risk is measured at the end of the year as the standard deviations of the residuals of the market model estimated using return data of the previous sixty months. Share denomination is measured as the share price (in BEF) of the firm. Finally, liquidity is measured by the number of non-zero price return months in a year. We calculate the correlations in three different subperiods (Before World War I, during the Interbellum and after World War II).

Panel A: ***Before World War I***					
	Age	Size	Idiosyncratic risk	Share denom.	Liquidity
Age	1.000				
Size	0.304	1.000			
Idiosyncratic risk	-0.240	-0.532	1.000		
Share denomination	0.416	0.622	-0.511	1.000	
Liquidity	0.164	0.351	0.001	0.162	1.000
Panel B: ***Interbellum***					
	Age	Size	Idiosyncratic risk	Share denom.	Liquidity
Age	1.000				
Size	0.112	1.000			
Idiosyncratic risk	-0.086	-0.406	1.000		
Share denomination	0.263	0.666	-0.458	1.000	
Liquidity	0.068	0.324	-0.003	0.221	1.000
Panel C: ***After World War II***					
	Age	Size	Idiosyncratic risk	Share denom.	Liquidity
Age	1.000				
Size	0.053	1.000			
Idiosyncratic risk	-0.043	-0.434	1.000		
Share denomination	0.231	0.576	-0.435	1.000	
Liquidity	0.002	0.295	-0.007	0.156	1.000

4. The decision to pay dividends

4.1 Univariate analysis

In Table II − 4 we differentiate between characteristics of Payers and Non-payers[4]. Before World War I (Panel A), payers are approximately four times larger than non-payers. Payers have a market capitalization of on average 1,029.60 million BEF, whereas non-payers have a market capitalization of on average 253.73 million BEF. Payers are also on average older than non-payers (22.75 years versus 15.48 years) in the pre-World War I era. Next, payers are found to have a lower level of idiosyncratic risk than non-payers (4.86 vs. 10.01) and payers have a higher share price than non-payers (860.52 BEF vs. 240.63 BEF). Finally, payers are also more liquid, as the stocks of paying firms traded on average 9.55 months per year, whereas the stocks of non-paying firms traded on average 8.31 months per year. Similar conclusions hold for the Interbellum (Panel B) and the post-World War II period (Panel C). As such, for all sample periods, payers are found to be larger and older. Additionally, payers are less risky than non-payers, they have a higher share denomination and they are more liquid.

[4] We further make a distinction between Always payers and Never payers (Results are available in Appendix B at the end of this dissertation). In each different subperiod, firms are classified as an Always payer (Never payer) if they pay a dividend (do not pay a dividend) in each year that they are in the sample. We find always payers to be larger and older than never payers. Always payers face less idiosyncratic risk than non-payers, have a higher share price than never payers and always payers are found to be more liquid than never payers.

Table II − 4 Difference in firm characteristics among dividend payers and non-payers This table reports the differences in firm characteristics between payers and non-payers Size is measured as the market capitalization at the end of year *t* and is adjusted for inflation. Age is calculated as the number of years since a firm's incorporation. Idiosyncratic risk is calculated as the standard deviation of the residual of the market model, estimated using return data of the previous sixty months. Share denomination is measured by the firm's share price at the end of year *t*. Share denomination is also adjusted for inflation. Finally, liquidity is measured as the number of non-zero return months in year *t*.

Panel A: Before World War I			
	Payer	Non-Payer	Difference
Dividend yield (in %)	5.65	0.00	5.65***
			(0.08)
Size (in million 1980 BEF)	1,029.60	253.73	775.87***
			(28.87)
Age (in years)	22.75	15.48	7.27***
			(0.30)
Idiosyncratic risk (in %)	4.86	10.01	-5.15***
			(0.07)
Share denomination (in 1980 BEF)	84,208.05	23,375.13	60,832.92***
			(1,563.36)
Liquidity (in months)	9.55	8.31	1.23***
			(0.06)
Panel B: Interbellum			
	Payer	Non-Payer	Difference
Dividend yield (in %)	5.69	0	5.69
			(0.05)
Size (in million 1980 BEF)	932.63	216.31	716.32***
			(36.01)
Age (in years)	32.21	28.81	3.40***
			(0.33)
Idiosyncratic risk (in %)	8.58	12.64	-4.06***
			(0.08)
Share denomination (in 1980 BEF)	25,012.24	6,056.86	18,955.38
			(615.80)
Liquidity (in months)	11.09	9.59	1.51***
			(0.04)
Panel C: Post-World War II period			
	Payer	Non-Payer	Difference
Dividend yield (in %)	5.65	0	5.65***
			(0.09)
Size (in million 1980 BEF)	5,423.12	551.92	4,871.20***
			(446.48)
Age (in years)	58.25	56.64	1.60***
			(0.44)
Idiosyncratic risk (in %)	6.12	8.58	-2.45***
			(0.04)
Share denomination (in 1980 BEF)	6,903.56	2,004.97	4,898.59***
			(164.03)
Liquidity (in months)	11.36	10.68	0.68***
			(0.02)

4.2 Dividend determinants and the institutional environment

To identify which firm characteristics affect the decision to pay dividends, we estimate logit models. The dependent variable, $Payer_{i,t}$, is equal to 1 if firm *i* pays a dividend in year *t* and zero otherwise. As independent variables, we include $Age_{i,t-1,}$ $Size_{i,t-1}$, $Idiosyncratic\ risk_{i,t-1}$, $Share\ denomination_{i,t-1}$ and $Liquidity_{i,t-1.}$ Additionally, we also include industry dummies (Financials, Transport, Steel & Non-ferrous metals, Coal mining, Chemicals, Electricity & Oil, and Others). We follow Fama & French (2001) and Denis & Osobov (2008) and estimate these logit regressions on an annual basis. The coefficient estimates per subperiod are then calculated as the average of this annual coefficients in the pre-World War I era (1854−1913)[5], the Interbellum (1924−1939) and the post-World War II period (1951−2012). Newey-West (1987) standard errors with four lags are reported. Table II − 5 shows the results.

In the period before World War I, we find the decision to pay dividends is positively affected by firm size, the share denomination and the firm's liquidity, while the decision to pay is negatively affected by the firm's level of idiosyncratic risk. The age of the firm does not affect the firm's decision to pay. Also during the Interbellum and after World War II, the dividend decision is affected by the same firm characteristics. Larger firms, firms with lower idiosyncratic risk, firms with a higher share denomination and more liquid firms are more likely to pay, whereas the age of the firm does not affect the decision to pay dividends.

Next, we investigate whether the same firm characteristics affect the decision to continue the dividend payment and the decision to initiate. Therefore, we separately estimate our annual logit model for payers in the previous year (Panel B) and for non-paying firms in the previous year (Panel C)[6]. Generally speaking, the decision to continue is driven by the same characteristics as before. Larger firms, firms with a lower level of idiosyncratic risk and a higher share denomination are more likely to continue their dividend payment. In most subperiods, the stock's liquidity does not affect the decision to continue the dividend payment. Also the decision to initiate seems to be driven by similar characteristics. Firms with a lower level of idiosyncratic risk, a higher share denomination and more liquid firms are more likely to start paying a dividend. Size only positively affects the decision to initiate dividends in the post-World War II period, whereas age negatively affects the decision to initiate in all periods. Note that the intercept for the sample

[5] Note that for the period before World War I, the first annual logit model is estimated for the year 1854. Before 1854, we have too few observations (< 30) to reliably estimate the model.

[6] Given data restrictions, we are not able to annually estimate this model for each year in our sample. In the years before 1895, the continuation rate of firms in our sample of firms that paid a dividend in the previous year was almost 100%, whereas the initiation rate of firms in our sample of firms that did not pay a dividend in the previous year was almost 0%. As such, there was no(t enough) variation in the dependent variable to reliably estimate the annual logit model. We also do not include industry-dummies in these analyses, as in some years not enough observations are available to reliably estimate the industry-dummies.

where we only include past payers is positive and significant in all periods but the Interbellum, whereas the intercept for the sample with previous non-payers is negative and significant in all subperiods. This indicates that there is a certain level of stickiness in the dividend policy of firms. Controlling for firm characteristics, firms that pay a dividend are more likely to continue the dividend payment, while firms that did not pay a dividend in the previous year, generally not intend to start paying a dividend. In the next section, we further investigate whether our firm characteristics affect the dividend smoothing behavior.

To summarize, we find larger firms, firms with lower idiosyncratic risk, firms with a higher share denomination and more liquid firms are more likely to pay dividends. On the one hand, this is evidence against signaling arguments as a first-order determinant to pay dividends. Indeed, if firms paid dividend because of signaling motives, firms that would benefit the most from signaling (small firms, risky firms), would be more likely to pay dividends. However, we find large firms with a lower level of idiosyncratic risk, firms which typically have fewer information asymmetry issues, are most likely to pay dividends. On the other hand, given that larger firms are usually more mature, our evidence is more in line with the life-cycle explanation of dividends. Larger firms are typically more mature and as such, larger firms should be more likely to pay dividends according to the life-cycle hypothesis of dividends. The positive relationship between dividends and liquidity is not in line with the home-made dividend proposition.

Table II − 5 The determinants of the decision to pay This table reports the results of the logit regressions. $Payer_{i,t}$, the dependent variable, is equal to 1 if a firm pays a dividend in year t and 0 otherwise. As independent variables, we include $Age_{i,t-1}$, $Size_{i,t-1}$, $Idiosyncratic\ risk_{i,t-1}$, $Share\ denomination_{i,t-1}$ and $Liquidity_{i,t-1}$. Size is measured as the percentile of firms with the same or a lower market capitalization. Age is measured as the number of years since the firm's incorporation. Again, this variable is transformed to a percentile variable. Idiosyncratic risk is measured as the percentile of firms with the same or a lower level of idiosyncratic risk, which is calculated as the volatility of the residual of the market model, estimated using return data of the previous sixty months. Liquidity is measured as the number of non-zero return months. We estimate annual logit regression and calculate the average coefficient in each subperiod. Newey-West (1987) standard errors with four lags are reported.

Panel A: Entire sample

	Before World War I (1855 – 1913)	Interbellum (1924 – 1939)	Post-World War II (1952 – 2012)
Size	1.4696***	1.3107**	2.7235***
	(0.3794)	(0.4636)	(0.3018)
Age	0.5713	-0.2997*	-0.1629
	(0.5394)	(0.1447)	(0.2075)
Idiosyncratic risk	-2.4682***	-2.6302***	-2.1596***
	(0.5552)	(0.2027)	(0.3240)
Share denomination	5.2577***	4.2574***	3.2235***
	(0.5394)	(0.2090)	(0.3183)
Liquidity	0.1433***	0.1994***	0.1197***
	(0.0362)	(0.0164)	(0.0230)
Intercept	-1.8611***	-3.0541***	-1.1687***
	(0.6185)	(0.5215)	(0.2878)
Industry-dummies	Yes	Yes	Yes

Panel B: Payers$_{t-1}$			
	Before World War I	Interbellum	Post-World War II
	(1895 – 1913)	(1924 – 1939)	(1952 – 1997)
Size	1.7124***	2.1460***	1.7400***
	(0.3707)	(0.4998)	(0.2627)
Age	0.9437***	0.1650	-0.2526
	(0.2804)	(0.2671)	(0.1663)
Idiosyncratic risk	-1.7244***	-1.1007***	1.1432***
	(0.3131)	(0.2680)	(0.2034)
Share denomination	2.5171***	1.3689***	1.6436***
	(0.5164)	(0.2518)	(0.2196)
Liquidity	-0.0575	0.0160	-0.0873*
	(0.0364)	(0.0381)	(0.0456)
Intercept	1.4497***	0.1315	2.3154***
	(0.4100)	(0.4118)	(0.4949)
Industry-dummies	No	No	No
Panel C: Non-payers$_{t-1}$			
	Before World War I	Interbellum	Post-World War II
	(1895 – 1913)	(1924 – 1939)	(1952 – 2012)
Size	-0.3025	0.3803	2.9055***
	(0.4101)	(0.4516)	(0.7063)
Age	-0.6253**	-0.8239**	-1.1708***
	(0.2223)	(0.3676)	(0.3733)
Idiosyncratic risk	-3.772***	-1.3226***	-1.4577**
	(0.662)	(0.2043)	(0.6490)
Share denomination	3.622***	3.5106***	1.3487*
	(0.6213)	(0.3757)	(0.6932)
Liquidity	0.1889***	0.1336***	0.1284**
	(0.0453)	(0.1556)	(0.0507)
Intercept	-1.9395***	-3.7957***	-3.1044***
	(0.2962)	(0.3230)	(0.6123)
Industry-dummies	No	No	No

4.3 Dividend determinants and the state of the economy

Next, we investigate whether the determinants of dividend policy depend on the state of the economy. At the end of each year, we calculate the annualized total stock return. The stock market is defined to be advancing if the annualized total stock market return is positive, whereas it is defined to be declining if the annualized total stock market return is negative. This definition of advancing and declining markets is similar to Fuller and Goldstein (2011). Rather than calculating the average coefficient and standard errors by subperiod, we calculate the average coefficients over all advancing years and all declining years. The coefficient estimates and robust standard errors are reported in Table II − 6.

In both states of the economy, larger firms, firms with a lower level of idiosyncratic risk, firms with a higher share denomination and more liquid firms are found to be more likely to pay dividends.

Table II − 6 The determinants of the decision to pay in advancing and declining markets This table reports the results of the logit regressions, estimated in order to explain the determinants of the decision to pay in different environments. $Payer_{i,t}$, the dependent variable, is equal to 1 if a firm pays a dividend in year *t* and 0 otherwise. As independent variables, we include $Age_{i,t-1}$, $Size_{i,t-1}$, $Idiosyncratic\ risk_{i,t-1}$, $Share\ denomination_{i,t-1}$, and $Liquidity_{i,t-1}$.

	Advancing markets	***Declining markets***
Size	1.6876***	2.3269***
	(0.1838)	(0.2881)
Age	0.2431	-0.0791
	(0.2453)	(0.1536)
Idiosyncratic risk	-2.1856***	-2.6784***
	(0.2073)	(0.2500)
Share denomination	4.2151***	4.2310***
	(0.2641)	(0.2474)
Liquidity	0.1491***	0.1239***
	(0.0172)	(0.0224)
Intercept	-1.7686***	-1.5204***
	(0.2254)	(0.3258)
Industry-dummies	Yes	Yes

4.4 Dividend determinants and the industry maturity

Next, we also investigate whether the determinants of dividend policy vary throughout the lifecycle of the industry. In this section, we specifically focus on two sectors: the Transport industry and Chemicals, Oil & Electricity. While the transport industry was an important industry in the pre-World War I period, it was a rather mature industry during the Interbellum. The Chemicals, Oil & Electricity industry was a relatively new, high growth industry during the Interbellum and is more mature in the post-World War II era. Due to data availability, it is impossible to estimate logit regressions for each year separately. Therefore, we estimate pooled logit models including all firms in the Transport industry for the period before World War I, and during the Interbellum; for the Chemicals, Oil and Electricity industry, we estimate pooled logit models during the Interbellum and in the period after World War II. Important to note is that we redefine the percentile-variables (*Size, Age, Idiosyncratic risk, Share denomination*). Previously, they were calculated as the percentile of all firms that have the same or lower value of the specific variable. As in this regression models we only include firms from the same industry, we calculate these percentile variables as the percentile of firms within the same industry that have the same or lower value. Coefficient estimates and robust standard errors are reported in Table II − 7.

Again, both in young, growing industries (Transport sector before World War I, Chemicals, Electricity & Oil industry in the Interbellum) and in mature industries (Transport sector in the Interbellum and Chemicals, Electricity & Oil in the post-World War II era), we find the decision to pay dividends is driven by similar characteristics as identified above. Larger firms, firms with a lower level of idiosyncratic risk, firms with a higher share denomination and more liquid firms are more likely to pay. Additionally, in some periods, age also positively affects the decision to pay dividends. This is evidence in line with the life-cycle hypothesis of dividends, while it is inconsistent with signaling arguments and with the home-made dividend proposition.

Table II − 7 The determinants of the decision to pay in different stages of the industry life-cycle This table reports the results of the logit regressions, estimated in order to explain the determinants of the decision to pay in different environments. $Payer_{i,t}$, the dependent variable, is equal to 1 if a firm pays a dividend in year *t* and 0 otherwise. As independent variables, we include $Age_{i,t-1}$, $Size_{i,t-1}$, $Idiosyncratic\ risk_{i,t-1}$, $Share\ denomination_{i,t-1}$, and $Liquidity_{i,t-1}$.

	Transport industry		***Chemicals, Electricity & Oil industry***	
	Before World War I	During Interbellum	During Interbellum	After World War II
Size	2.3360***	1.3907***	1.1726***	0.9282***
	(0.3347)	(0.4569)	(0.3389)	(0.2888)
Age	1.3207***	0.3299	0.1864	0.6334***
	(0.2778)	(0.2857)	(0.2775)	(0.2318)
Idiosyncratic risk	-2.6989***	4.0702***	3.7718***	3.6835***
	(0.3263)	(0.4929)	(0.3574)	(0.3031)
Share denomination	3.5402***	-3.5166***	-3.2428***	-2.0418***
	(0.3650)	(0.3452)	(0.3256)	(0.2718)
Liquidity	0.1339***	0.1878***	0.2844***	0.0528
	(0.0210)	(0.0272)	(0.0317)	(0.0340)
Intercept	-1.8333***	-3.7471***	-3.2315***	-0.5089
	(0.3152)	(0.3944)	(0.4276)	(0.5035)
Industry-dummies	No	No	No	No

5. Dividend smoothing

Next, we investigate whether the firm characteristics as identified above also have an impact on the degree of dividend smoothing. In order to do so, we follow Leary and Michaely (2011) and calculate a speed of adjustment (SOA) coefficient per firm. However, as the Leary and Michaely SOA coefficient is estimated based on a modified Lintner model (1956), earning data are required to estimate this SOA-coefficient. As the collection of earnings for all firms over the entire sample period is beyond the scope of this paper, we manually collect the earnings for a subsample of firms in a limited number of years. We collect earning data from the Receuil Financier, an important Belgian financial annual, which is published between 1894 and 1975. Each year, the Receuil Financier reports among others the balance sheet of firms, information about the board of directors and information about the evolution of the capital of the firm. More interestingly, the Receuil Finacier also reports the earnings of the eleven or twelve previous years. As such, for a subset of firms, we collect earning data from the 1913-edition (earning data for 1901−1912), the 1935-edition (earning data for 1924−1935) and the 1960-edition (earning data for 1949−1959) of the Receuil Financier. For the most recent period (2002−2012), earnings data are collected from the Belfirst database of Bureau Van Dijk, Only the 200 largest firms are included in this limited sample. Additionally, we follow Leary and Michaely (2011) and require at least ten years of non-missing earnings data. For 1913, 134 companies of the 200 largest firms are in the sample for at least 10 years. For 118 of these companies, we are able to collect the earning data. For the 1935 sample, 137 companies of the 200 largest firms are in the sample for at least 10 years at the end of 1935. We were able to collect earnings data for 121 companies of our sample of large firms. For the 1960 sample, 172 companies of the 200 largest companies are in the sample for at least 10 years. For 145 companies, the Receuil Financier reports the series of earning data. Finally, in 2012, there

are only 147 companies in our entire sample, of which 82 are in the sample for at least ten years. From the Belfirst database, we are able to retrieve earnings for 77 firms.

Table II − 8 Panel A reports the mean and median pay-out ratio for the firms in our sample. Based on this limited sample, the dividend payout ratio seems to decrease over time. However, caution is needed when interpreting these results as changes in accounting standards might also cause differences in the pay-out ratio over time. However, a similar evolution arises in other countries. In all subsamples, dividend pay-out ratios in Belgium are very comparable to dividend payout ratios in the Netherlands (De Jong et al., 2014). For our 1913-sample, the average pay-out ratio for Belgian firms is equal to 44.55%, whereas in the Netherlands the average dividend pay-out ratio in 1913 is equal to 43.90%. Also during the Interbellum, the dividend pay-out ratio in Belgium is very comparable to the dividend payout ratio in the Netherlands (30.36% for our 1935 sample, vs. 29.50% in the Netherlands in 1938). For our 1960 sample, we find an average pay-out ratio of 28.09%, whereas the average pay-out ratio in the Netherlands is equal to 33.30% in 1958. For our 2012-sample, the average pay-out is equal to 23.03%, whereas in the Netherlands, the average dividend pay-out ratio of listed firms in 2003 is equal to 18.7%. So also in the Netherlands, the dividend payout ratio seems to have decreased over time. Also more recently, evidence of a declining dividend payout ratio is found in 15 countries of the European Union between 1989 and 2005 (von Eije and Megginson, 2008)

We now investigate whether the smoothing behavior of firms is also affected by the firm characteristics as identified above. For each firm, in each period, we estimate the speed of adjustment coefficient, in a way similar to Leary and Michaely (2011). First, we calculate the target payout ratio (TPR_i). This is the firm's median payout ratio[7] over the sample period. Using this estimated target, we calculate the deviation from target for each period and then estimate the speed of adjustment coefficient as $\hat{\beta}$ from the following regression:

$$\Delta D_{it} = \alpha + \beta \times dev_{it} + \varepsilon_{it}, \tag{II.1}$$

where

$$dev_{it} = TPR_i \times E_{it} - D_{it-1}. \tag{II.2}$$

Next, we estimate a regression model with the speed of adjustment coefficient as the dependent variable. As independent variables, we include the same firm characteristics as above. However, given that we only

[7] The pay-out ratio is calculated as the total amount of dividends divided by the company's earnings.

have a limited sample of firms, we calculate our independent variables differently. For *Size*, we use the logarithm of the total market capitalization; *Age* is measured as the logarithm of the number of years since incorporation and *Share denomination* is also measured by the logarithm of the share price. For idiosyncratic risk and liquidity, we use the absolute values. As we only have one SOA per firm per period, we calculate each independent variable as the median value of the firm characteristics in each subperiod. Table II − 8 Panel B reports the coefficient estimates and robust standard errors.

Table II − 8 Dividend smoothing In Panel A, the mean and median payout ratio are reported. The payout-ratio is calculated as the total amount of dividends divided by the company's earnings. Panel B reports the results of the linear regression analysis with the speed of adjustment coefficient as dependent variable. As independent variables, we include Size, Age, Idiosyncratic risk , Share denomination and Liquidity. For each independent variable, we calculate the median value over the sample period.

Panel A: Dividend payout ratio				
	1913	1935	1960	2012
Mean pay-out ratio	44.55	30.36	28.09	23.03
Median pay-out ratio	44.16	27.73	23.20	14.92
Panel B: Determinants of dividend smoothing				
	1913	1935	1960	2012
Size	0.0446	-0.0528*	0.0136	-0.0290
	(0.0430)	(0.0289)	(0.0239)	(0.0231)
Age	-0.0270	0.0064	0.0022	-0.0146
	(0.0565)	(0.0745)	(0.0644)	(0.0673)
Idiosyncratic risk	0.0704***	0.0486**	0.0691***	0.0382
	(0.0238)	(0.0217)	(0.0247)	(0.0248)
Share denomination	0.0081	0.0821***	0.0668**	0.0104
	(0.0418)	(0.0289)	(0.0286)	(0.0485)
Liquidity	0.0391*	0.0774	-0.0400	
	(0.0225)	(0.0737)	(0.0377)	
Intercept	-0.9437	-0.4405	-.2523	0.6597
	(0.7814)	(0.9303)	(0.6014)	(0.7388)
R^2	14.76	15.41	9.97	10.25

The firm's level of idiosyncratic risk is an important determinant of the firm's smoothing behavior in all but the most recent smoothing sample. Firms with a higher level of idiosyncratic risk have a higher speed of adjustment coefficient, which means that these firms smooth less. This is consistent with Leary and Michaely (2011) who also find that firms with less volatile earnings and lower stock return volatility smooth more. Despite being consistent with prior research, this is again evidence against signaling as a first-order determinant of dividend policy. Indeed, firms with more information asymmetry should pursuit a stable dividend policy (Lintner, 1956). Further, in the 1935 sample and the 1960 sample, we find that firms with a higher share denomination have a higher speed of adjustment and as such, these firms smooth less. Next, for the 1913 sample, we also find that more liquid firms have a higher speed of adjustment coefficient which indicates that these firms smooth less. In the 1935 sample we find that larger firms have a lower speed of adjustment coefficient and as such smooth more. However, the results for liquidity and size are only valid in one of the four subsamples and are only marginally significant.

Overall, our smoothing analysis confirms the earlier findings that signaling motives are not a first order determinant of dividend policy. However, our smoothing analysis is only partial as the sample of firms for which we were able to calculate a speed of adjustment coefficient is rather small and additionally it covers only a short part of our entire sample period. Moreover, this analysis is based on accounting data, which makes it hard to compare our modern-day results with the results of one century ago.

6. Dividend concentration

To further investigate the importance of signaling, we investigate the concentration of dividends in our sample. Each year, we calculate the total amount of dividends paid by the 20% largest dividend payers and we compare this to the total amount of dividends paid by all firms in our sample. Results are reported in Figure II − 2. The degree of dividend concentration increases steadily over time. In the period before World War I, the mean (median) proportion of dividends paid by the 20% largest payers is equal to 60.94% (61.63%). During the Interbellum, the mean (median) proportion of dividends paid by the top 20% payers is equal to 71.85% (73.49%), and after World War II, this mean (median) proportion increases even further to 85.07% (87.28%). Our findings thus suggest that the minority of firms distribute the majority of dividends. Additionally, Figure II − 3 shows that these top 20% dividend payers are generally speaking large firms. In the period before World War I, this top 20% payers represent on average 49.31% of the total market capitalization (median: 50.61%). During the Interbellum, the relative market capitalization of the top 20% dividend payers is on average equal to 50.90% (median: 56.56%). After World War II, the top 20% of dividend payers represent on average 78.02% of the total market capitalization (median: 79.50%).

Our findings thus suggests that the majority of dividends is paid by the 20% largest dividend payers, and that the dividend concentration increases over our sample period. Additionally, these dividend payers represent a large part of the total market capitalization. Especially after World War II, these top 20% payers are large firms, as they represent more than 75% of the total market capitalization. The finding of dividend concentration over the entire sample period casts doubt about signaling as a first-order determinant of dividend policy. If managers use dividends as a signal, especially small firms would pay dividends. Given that especially large, well-known firms pay the majority of dividends, it is unlikely that firms use dividends for signaling reasons. However, given that the top 20% payers are typically large firms, these results are consistent with life-cycle arguments. Our findings are similar to DeAngelo et al. (2004), who document that in the US, the majority of dividends is paid by a small number of firms. Additionally, they also document earnings are concentrated. Moreover, this dividend and earnings concentration increases over time (1978−2000). Also for non-US countries, similar evidence is found (Denis and Osobov, 2008).

Figure II − 2 Proportion of dividends paid by the top 20% dividend payers, 1838−2012 This figure shows the evolution of the proportion of dividends distributed by the 20% largest dividend payers

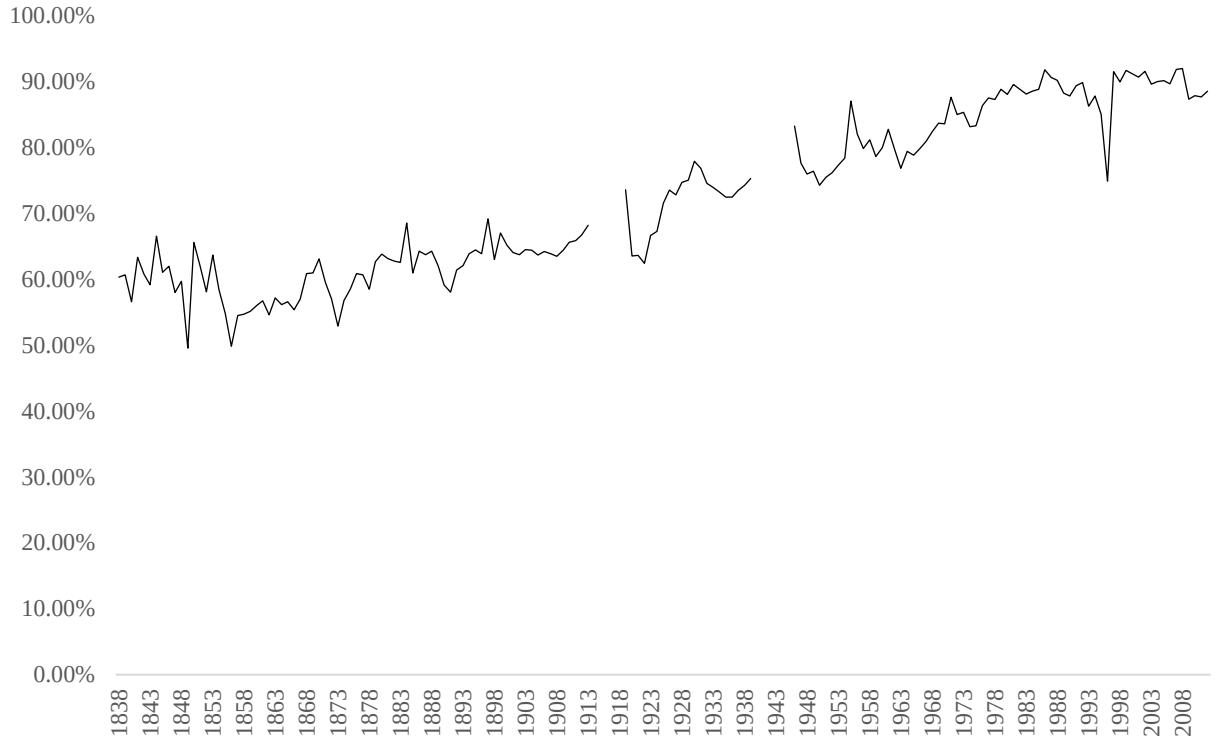
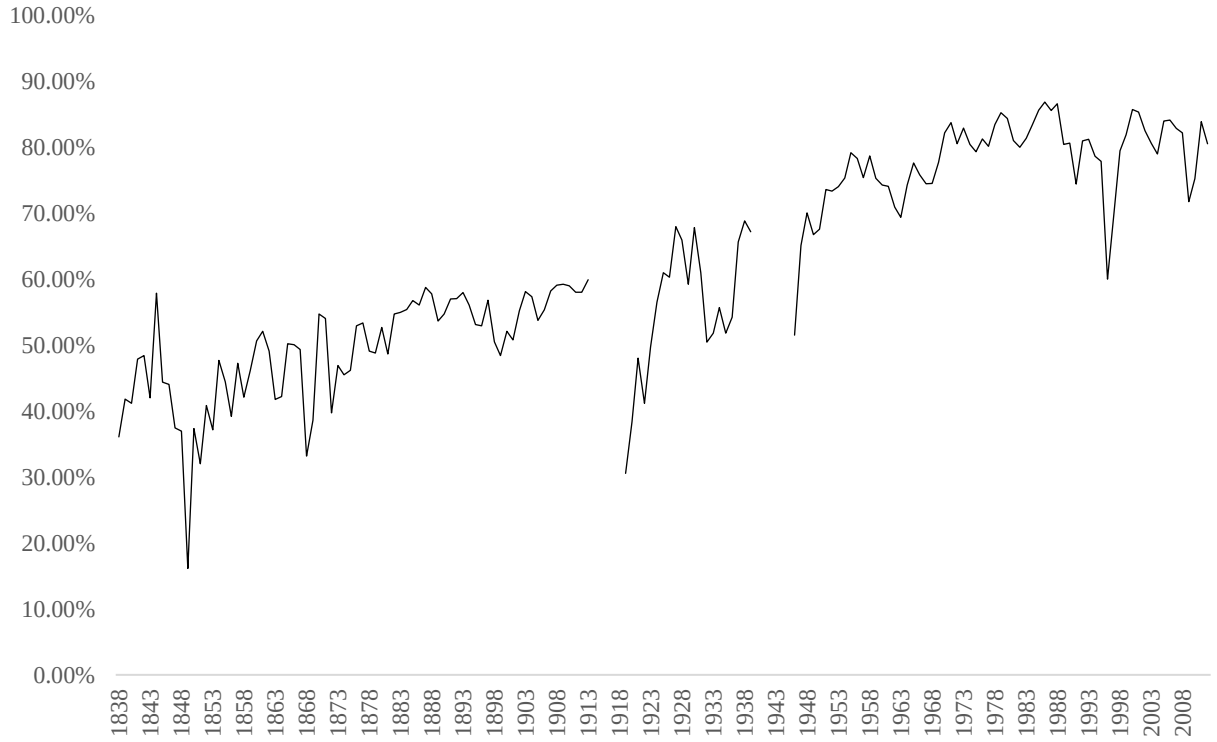


Figure II − 3 Relative market capitalization of top 20% dividend payers, 1838−2012 This graph reports the evolution of the market capitalization of the top 20% dividend payers



7. Do behavioral motives affect the decision to pay dividends?

DeAngelo et al. (2004) argue that the huge degree of dividend concentration among a small number of large firms, makes it very unlikely that the decision to pay dividends is driven by factors that affect all firms, like e.g. changes in the taxation regulation. In this spirit, it is hard to reconcile dividend concentration with behavioral theories to pay dividends, like e.g. the catering theory and the prospect theory.

According to catering theory, managers set their dividend policy in response to investors' demand for dividends: if dividend demand is high, managers start paying dividends, whereas if demand for dividends is low, managers are less inclined to pay (Baker and Wurgler, 2004a). However, if managers set their dividend policy depending on investor's demand for dividends, it is rather unlikely that only managers of the largest firms set their dividend policy in response to investor's appetite for dividends.

To test whether managers pay dividends for catering reasons, we follow Baker and Wurgler (2004a) and investigate the relationship between dividend dynamics and the demand for dividend. We calculate three dividend dynamics: $Initiate_t$ (initiation rate among stocks that were in the sample in year t-1 but did not pay a dividend in that year), $Continue_t$ (continuation rate among stocks that were in the sample in year t-1 and did pay a dividend in that year) and $Propensity\ to\ pay_{new\ stocks,t}$ (propensity to pay/initiate among stocks that were not in the sample in year t-1). We measure the demand for dividends as the difference between the future excess return of payers over nonpayers. We calculate the excess return on an annual basis and consider a firm to be a payer (non-payer) if the sum of dividends paid throughout year t is positive (zero). We calculate the excess return in year t +1, year t +2, year t +3 and the cumulative excess return from year t +1 to year t +3. We regress the excess return on the different dividend measures. We use Newey-West (1987) standard errors with four lags. We estimate our regression model for the pre-World War I era, the Interbellum and the post-World War II period. Following the intuition of Baker and Wurgler (2004a), we argue that managers will start paying a dividend or continue their dividend payment if the market values payers higher than non-payers. The overpricing of payers will reverse in the future and thus a high rate of initiation and a high continuation rate should forecast low excess returns. Results are reported in Table II − 9.

We barely find significant results and if the coefficient estimate is significant, in most cases the sign is opposite to expectations. We thus find no evidence that managers set their dividend policy in response to the dividend demand in the different subperiods, as suggested by the catering theory. Our results are in line with those of Denis and Osobov (2008), who find evidence for dividend concentration in multiple countries, but no evidence for catering theory.

Table II − 9 Catering theory This table reports the regression results of the future excess return of dividend payers over nonpayers on the three dividend dynamics. Coefficient estimates, standard errors (between parentheses) and significance levels are reported. Standard errors are Newey-West standard errors with 4 lags are reported. *, ** and *** report significance levels at 10%, 5% and 1% respectively.

Panel A: Pre-World War I period			
	$Initiate_t$	$Continue_t$	Propensity to $pay_{new\ firms}$
Excess $return_{t+1}$	0.041	0.856	-0.027
	(0.199)	(0.791)	(0.062)
Excess $return_{t+2}$	0.331**	0.438	0.020
	(0.134)	(0.419)	(0.068)
Excess $return_{t+3}$	0.124	0.024	-0.069
	(0.182)	(0.359)	(0.058)
Cumulative excess return	0.499	1.319*	-0.076
	(0.345)	(0.714)	(0.102)
Panel B: World War period			
	$Initiate_t$	$Continue_t$	Propensity to $pay_{new\ firms}$
Excess $return_{t+1}$	0.867	0.006	0.093
	(0.602)	(0.0353)	(0.222)
Excess $return_{t+2}$	0.296	0.256	0.515
	(0.812)	(0.345)	(0.313)
Excess $return_{t+3}$	0.820	1.817**	0.436**
	(0.781)	(0.751)	(0.194)
Cumulative excess return	1.995	2.012*	1.056*
	(1.899)	(1.013)	(0.543)
Panel C: Post-World War II period			
	$Initiate_t$	$Continue_t$	Propensity to $pay_{new\ stocks}$
Excess $return_{t+1}$	-0.252	0.043***	0.061
	(0.219)	(0.005)	(0.121)
Excess $return_{t+2}$	0.056	-0.558	0.040
	(0.241)	(0.648)	(0.116)
Excess $return_{t+3}$	0.000	-0.305	0.120
	(0.715)	(0.893)	(0.124)
Cumulative excess return	0.278	-2.776*	0.130
	(1.047)	(1.460)	(0.228)

Similar as for catering theory, it is also very hard to reconcile the evidence of dividend concentration with the prospect theory. According to prospect theory, investors underweight random outcomes compared to certain outcomes (Kahneman and Tversky, 1979). As such, dividends are considered to be a bird in the hand, whereas capital gains are only certain once they are realized (capital gains might fly away) (Shefrin and Statman, 1984). Therefore, if this theory holds investors should put a premium on dividend payers. Given the huge degree of dividend concentration, it is rather unlikely that only managers of large firms pay dividends because investors overweight the importance of dividends.

In order to test whether prospect theory holds in our sample, we investigate whether the dividend premium is higher when there is more uncertainty about capital gains, i.e. in periods of economic downturn, compared to in periods of economic prosperity, as in Fuller and Goldstein (2011). In order to do so, we construct a portfolio of payers and non-payers for each month. We follow the approach of Fuller and Goldstein (2011) and classify a firm as a payer starting in the month after the firm starts paying a dividend. The firm is considered to be a payer until the dividend omission, delisting or the end of the sample period. As long as a firm did not initiate a dividend, it is considered as a non-payer. Similar to dividend initiation, we consider a

firm as a non-payer starting from the month after the month in which the firm was normally expected to pay a dividend, but did not do so. This month is the omission month. In this way, we avoid that our results are biased by the positive (negative) stock market return in the initiation (omission) month. As such, we create monthly value-weighted rebalanced portfolios of paying and non-paying firms. The difference in returns of the portfolio of payers and non-payers is our measure for the preference of dividends. We use the stock market return as a measure for advancing and declining markets, as in Fuller and Goldstein (2011). If prospect theory holds, the dividend premium should be high (low) if the stock market return is low (high). As an additional way to test for the validity of prospect theory, we also capture the uncertainty surrounding capital gains by the volatility of the market return. In times of high stock market volatility, the uncertainty surrounding capital gains is higher, and as such, the dividend premium is likely to increase, whereas the opposite is true if the stock market volatility is low. We calculate the stock market volatility in month *m* using monthly stock market data of the previous 12 months. We regress the excess returns of payers over non-payers on the return of the market index (Model (1)), on the volatility of the market index (Model (2)) and on both the return on the market index and its volatility (Model (3)). We estimate these models in three subperiods using Newey-West standard errors with twelve lags (1987). We expect a negative relationship with the excess return and a positive relationship with the volatility. Results are reported in Table II – 10.

In the period before World War I (Panel A), we find no significant relationship between the excess return of payers over non-payers and the return on the market index (Model (1)) nor between the excess return and the volatility of the return of the market index (Model (2)). If we include both proxies in our regression (Model (3)), results are also insignificant. As such, the preference of payers over non-payers seems not to increase if capital gains become more uncertain. During the Interbellum (Panel B), we find a negative and significant relationship between the excess return and the return on the market portfolio (Model (1)) and between the excess return and the volatility of the return of the market portfolio (Model (2)). In Model (3), we also find negative significant coefficient estimates for both variables. As such, if the market return is higher, the preference for payers over non-payers decreases, which is in line with the predictions of the prospect theory. However, at the same time, if the volatility of the return is higher, the preference for payers over non-payers also decreases. The coefficient estimate of the volatility of the stock return is more than twice as large as the coefficient of the return of the market index, and thus also during the Interbellum, we do not find evidence in line with the prospect theory. After World War II, the results are insignificant as well for the three models. As such, we do not find a relationship between the dividend premium and the market conditions.

Table II − 10 Prospect theory of dividends This table shows the results of the regression with the excess return of payers over non-payers as dependent variable and stock market return (Model (1)), volatility of the stock market return (Model (2)) and both stock market return and its volatility (Model (3)) as the independent variables. We use Newey-West standard errors (1987) with twelve lags. The regressions are conducted for three subperiods: the pre-World War I era (Panel A), the Interbellum (Panel B) and the post-World War II period (Panel C). *, ** and *** indicate significance levels of 10%, 5% and 1% respectively.

Panel A: Pre-World War I period			
	Model (1)	Model (2)	Model (3)
Intercept	-0.002	0.002	0.003
	(0.002)	(0.002)	(0.003)
Stock market return	-0.295		-0.294
	(0.202)		(0.199)
Volatility of market return		-0.258	-0.252
		(0.198)	(0.186)
Number of observations	912	912	912
R^2	1.92	0.36	2.27
Panel B: Interbellum			
	Model (1)	Model (2)	Model (3)
Intercept	-0.005	0.027*	0.028**
	(0.003)	(0.014)	(0.012)
Stock market return	-0.263**		-0.263**
	(0.118)		(0.116)
Volatility of market return		-0.600 **	-0.602**
		(0.302)	(0.238)
Number of observations	252	240	240
R^2	10.49	3.91	14.16
Panel C: Post-World War II period			
	Model (1)	Model (2)	Model (3)
Intercept	0.000	0.005	0.004
	(0.001)	(0.007)	(0.007)
Stock market return	0.071		0.076**
	(0.055)		(0.054)
Volatility of market return		-0.113	-0.120
		(0.193)	(0.194)
Number of observations	804	792	792
R^2	0.52	0.18	0.77

As we do not find evidence in line with catering theory or prospect theory in any of the subperiods, our results indicate that behavioral motives are not a first-order determinant of the decision to pay dividends.

8. Conclusion

In this paper, we investigate why firms pay dividends in a period of 175 years. The determinants of dividend policy are remarkably similar in different institutional settings. Moreover, the determinants of dividends are the same in different states of the economy and do not depend on the maturity of the industry. We find the decision to pay is affected by the firm's size, the level of idiosyncratic risk, the share denomination and the stock's liquidity. Larger firms, firms with a lower level of idiosyncratic risk, firms with a higher share denomination and more liquid firms are found to be more likely to pay dividends. Additionally, these characteristics are also found to affect the decision to continue the dividend payment and the decision to initiate dividends. Moreover, the level of idiosyncratic risk also determines the smoothing behavior of

companies. Although prior studies show that the determinants of the decision to pay dividends are stable across countries (von Eije and Megginson, 2008), we are the first to show that these determinants are stable for a period of almost two centuries, which is characterized by different institutional settings, different states of the economy and different important industries with changing industry maturity.

Overall, our results indicate that signaling arguments are not a first-order determinant of dividend policy. In first instance, we use regression analysis to investigate which firm characteristics affect the decision to pay and firm's smoothing behavior. The firm's level of idiosyncratic risk is negatively related to the decision to pay dividends and to the firm's degree of dividend smoothing. As firms with a high level of idiosyncratic risk face more information asymmetry, high-idiosyncratic risk firms should be more likely to pay and should smooth more. Additionally, in our logit regressions, we find larger firms, who are typically subject to less problems of asymmetric information, are more likely to pay dividends. If firms paid dividends because of signaling motives, smaller firms would be more inclined to pay. Next, we also show that dividends are concentrated among a minority of large firms. This is already true in the beginning of our sample period, and over time dividend concentration increases further. This again raises doubt about signaling as a motive to pay dividends. Indeed, if managers would use dividends as a signaling device, dividends should especially be paid by small firms. As such, our findings cast doubt about information asymmetry as a first-order determinant of dividend policy. Our findings are, however, consistent with lifecycle arguments. According to this theory, mature firms should be more likely to pay dividends as these firms are typically more profitable and have fewer investment opportunities. As larger firms are typically more mature, both the results of the regression analysis and the evidence on dividend concentration are an indication of the importance of life-cycle considerations as important determinant of dividend policy throughout our entire sample period. Our logit regressions also find a positive relationship between the firm's liquidity and its decision to pay, which is evidence against the home-made dividend proposition.

Further, catering theory and prospect theory are also very unlikely to be first-order determinants of dividend policy. The high degree of dividend concentration raises doubt about dividend policy being affected by an economy-wide phenomenon. According to catering theory, dividend policy is driven by the demand for dividends. As dividends are primarily paid by large firms, it is very unlikely that only the dividend policy of these firms is driven by changes in the demand for dividends. Our results indeed find no evidence in line with catering theory. Next, following prospect theory, investors underweight probable outcomes (e.g. capital gains) relative to certain outcomes (e.g. dividends). Again, it is very unlikely that this argument only holds for large firms, who are, given the degree of dividend concentration, typically the dividend paying firms of our sample. Our results indeed fail to find evidence in line with prospect theory. Moreover, our analysis of

dividend concentration offers an explanation of why we do not find evidence that dividend policy is affected by the level of investor protection or the level of taxation, as is documented in the first chapter of this dissertation. Indeed, changes in the level of investor protection (e.g. the introduction of publication requirements in 1873) or the introduction of dividend taxes in 1920 are economy-wide phenomena and as such should affect large and small firms. The huge degree of dividend concentration which is found throughout our entire sample period, indicates that dividend policy is unlikely to be driven by changes in the institutional environment, as these changes would affect the dividend policy of all firms in the economy.

Of course, our paper has its limitations. We do not have accounting data for the entire sample, dividend announcement dates are not available, nor do we have ownership data. As such, we are not able to test whether dividends predict future earnings, nor whether the signaling value of dividends changes over time. However, measuring firm characteristics using merely stock market data has as major advantage that we are able to measure our firm characteristics consistently over time, which is, given the huge changes of accounting standards in our sample period, impossible to do with accounting data. As trading data are also not available (e.g. bid-ask spread, turnover), our measure for a stock's liquidity is also rather rough.

Nevertheless, our analysis provides some important insights. First, the characteristics of dividend payers are found to be stable for long periods of time. This is the case in different institutional settings, different states of the economy and different phases of the industry life-cycle. Second, over our very long sample period, the majority of dividends is paid by the minority of firms. This dividend concentration increases over time, as does the proportion of the market capitalization represented by this limited numbers of large dividend payers. Finally, while signaling motives, home-made dividends and behavioral motives are found to be unlikely to be first-order determinants of dividend policy, the decision to pay seems to be driven predominantly by life-cycle arguments.

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Chapter III. Persistence of dividend policy: Long-run evidence*

ABSTRACT

Using a unique sample of firms listed on the Brussels Stock Exchange since 1824, we find that the initial dividend policy, measured as the decision to pay and the dividend per share at the end of the first listing year, has a long-lasting impact on future dividend policies. However, the impact of the initial dividend policy decreases over the company's life. This is especially true for the decision to pay, whereas the impact of the initial dividend per share persists for several decades. This indicates that the decision to pay is more open for changes, whereas the magnitude of the dividend payment is very persistent.

Keywords: Dividend policy, Imprinting theory, Life-cycle considerations, Belgium

* This chapter is co-authored by Jan Annaert (University of Antwerp and Antwerp Management School) and Marc Deloof (University of Antwerp and Antwerp Management School).

1. Introduction

A number of studies has shown that the capital structure of firms is largely driven by an unobserved component that is very stable over long periods of time (e.g. Hanousek and Shamshur, 2011; Hanssens et al., 2016; Lemmon et al., 2008). For dividend policy, there is substantial evidence on a short-term stickiness (e.g. Brav et al., 2005; Lintner, 1956). Given that the capital structure of the firm and the payout decision are inseparable and given this short-term stickiness, a logical question is whether dividend policy is also driven by a stable component in the long run. However, if companies aim for a stable capital structure, changes in the company's resources imply, ceteris paribus, a flexible payout policy. Focusing on firms listed on the Brussels Stock Exchange (BSE) since 1824, this paper investigates whether the dividend policy[1] at the moment of a company's first listing has a long-lasting impact on future dividend policies.

From a theoretical perspective, it is unclear how dividend policy should evolve over the life of a firm. On the one hand, the life-cycle theory of dividends argues that dividend policy changes throughout the company's life (e.g. DeAngelo et al., 2006; Grullon et al., 2002). Young, small firms with many growth opportunities are less likely to pay dividends. Once firms mature, their growth opportunities decline and the firm becomes more profitable. As such, firms should become more likely to pay dividends when going to a more mature stage in the lifecycle. This suggests the absence of a stable component in dividend policy. Therefore, the initial dividend policy is unlikely to have a long-lasting impact on future dividend policies. On the other hand, dividends are found to be conservative (e.g. Brav et al., 2005; Lintner, 1956). Dividends are not set de novo each year and as such, the lagged dividend decision affects the current and future dividend decisions. Given this conservativeness, the initial dividend policy is expected to affect future dividend policies. This argument is consistent with imprinting theory (Marquis and Tilcsik, 2013; Stinchcombe, 1965), a theory coming from the management literature. Imprinting theory suggests that *"during a brief period of susceptibility, a focal entity develops characteristics that reflect prominent features in the environment, and these characteristics continue to persist despite significant environmental changes in subsequent periods"* (Marquis and Tilcsik, 2013, p. 199). Translated to our settings, the imprinting theory suggests that the initial dividend policy is a characteristic that persists over time.

Our long sample period is particularly suited to investigate the persistent component in dividend policy. As we have data for all firms ever listed on the BSE since the moment of their first listing, we are able to measure the initial dividend policy for each firm at the same point in the life-cycle (i.e. the moment of the first listing). This is a major difference with studies on the persistence in capital structure. Lemmon et

[1] Given that share repurchases are a rare phenomenon in Belgium during our sample period (see Chapter I of this dissertation), investigating dividends offers a rather complete picture of the firm's payout decision in our sample.

al. (2008), for instance, measure the initial leverage ratio as the first observed leverage ratio for listed firms in the period 1965−2003. As such, the "initial" leverage ratio of firms listed well before 1965 is not measured as the leverage ratio at the moment of the first listing. While, Hanssens et al. (2016) overcome this shortcoming by measuring the initial leverage ratio at the moment of founding, they only consider firms incorporated between 1996 and 1998. Additionally, Belgium also provides an interesting laboratory as, to the best of our knowledge, there is no other country in the world with complete dividend data over such a long period of time. These data are highly reliable as they are hand-collected from the Official Quotation Lists of the BSE and cross-checked using different sources (Annaert et al., 2012). Moreover, in the pre-World War I era, Belgium was a country with a flourishing economy. It was the first country on the European continent to industrialize and Belgium had a very active stock market in that era. At the turn of the 20th century, the BSE belonged to the largest stock exchanges in the world in terms of market capitalization (Dimson et al., 2015).

Our contributions to the literature are threefold. First of all, we contribute to the literature on the determinants of dividend policy (e.g. DeAngelo et al., 2006; Denis and Osobov, 2008; Fama and French, 2001), by adding a new explanatory variable, namely the initial dividend policy. Although existing studies (e.g. DeAngelo et al., 2006; Denis and Osobov, 2008; Fama and French, 2001) take into account the conservativeness of dividends by considering the impact of the one-year lagged dividend status, our study shows that this conservativeness goes back to at least the moment that a company is listed for the first time. Second, we extend the evidence on the persistence in capital structure (e.g. Hanousek and Shamshur, 2011; Hanssens et al., 2016; Lemmon et al., 2008) to another corporate finance policy. We find evidence that dividend policy is also driven by a very stable component, that changes slowly over the life of the firm. Third, we find evidence of imprinting at an important milestone in a company's life, namely the moment of a firm's first listing. Although Marquis and Tilcsik (2013) argue that there are during the life of a company several occasions during which the *"window of imprintability"* (Marquis and Tilcsik, 2013, p. 199) is open, studies on the imprinting theory traditionally focus on environmental conditions at the moment of founding (e.g. Hanssens et al., 2016). Even studies on entrepreneurial firms that enter the stock market, fail to investigate whether the *"window of imptrintability",* which is open at the moment of the firm's first list, enables firms to adopt a new layer of imprinted characteristics (e.g. Beckman and Burton, 2008; Judge et al., 2015)

Our results show that the initial dividend policy has a long-lasting impact on future dividend policies. Firms that initially pay a dividend are found to be more likely to pay dividends in the future. Additionally, firms that have a high level of dividends per share in their first listing year also have a higher dividend per share

in the future. This is an important finding, as this indicates that dividends have a very persistent component, which is not taken into account previously. Additionally, the effect becomes weaker when a firm goes through its lifecycle. As such, managers stick to their first dividend decision and are at the same time open to adjust dividend policy to their changing maturity. For the decision to pay, the impact of the initial dividend decision decreases already from the second listing decade, whereas for the dividend per share, the impact of the initial dividend per share only starts decreasing as of the fourth listing decade. This indicates that the decision to pay is more open for changes, whereas the magnitude of the dividend payment is very persistent.

In a series of robustness checks, we show that the impact of initial dividend policy on future dividend policies persists over time. Additionally, even the outbreak of the World Wars, which is found to strongly affect the dividend policy of Belgian firms (see Chapter I of this dissertation), does not destroy the relationship between the initial dividend policy and future dividend policies. Finally, in a subsample of firms that have their first listing within the first five years after incorporation, we also find evidence for a persistent component in dividend policy. As such, the stable component in dividends is very likely not only present from the moment of a firm's first listing, but already from the moment of incorporation.

The paper proceeds as follows. In Section 2, we discuss the Belgian settings in our 180-year sample period. Section 3 describes the data and the dividend measures. In Section 4, we investigate the role of initial dividend policy. Section 5 discusses the robustness checks. Finally, Section 6 concludes.

2. Historical settings

During our sample period, the legal environment in which Belgian firms operate, changed drastically[2]. Shortly after Belgian independence, investor protection was weak, both by present-day standards and by contemporaneous standards (Théate, 1905). At that time, the Commercial Code, as introduced by Napoleon in 1807, was still in force and was rather rudimentary with regard to limited liability companies. Royal permission was necessary to set up a limited liability company. Once the company was incorporated, there were almost no rules to which limited liability companies had to comply (Piret, 1946). In 1841, the Commercial Code changed for the first time, requiring limited liability companies to disclose financial statements on an annual basis. However, there was no regulation with respect to the precise content of these statements, nor was there any control on the correctness of these statements. There was an annual meeting which approved the financial statements, but this meeting was only open to shareholders owning at least

[2] For a more thoroughly discussion of the evolution of the institutional environment in Belgium, we refer to Chapter I of this dissertation.

five shares of 1,000 BEF[3] (Demeur, 1859). The Commercial Code changed again in 1873. The government permission required to incorporate a limited liability company, was abolished, but from that moment onwards, limited liability companies were required to publish a balance sheet at least once a year. Additionally, a supervisory board was assumed to monitor the balance sheet and the general meeting, which had to approve the balance sheet, was accessible for all shareholders (Guillery, 1886). In 1913, the layout of the balance sheet was to a limited extent determined (Wauwermans, 1914). Also during the Interbellum, the legal environment changed continuously. In 1920, dividend taxes were introduced (Gilson, 1921). After the major banking crisis in the 1930s, multiple voting shares were abolished, universal banks were forced to split up into commercial banks and holding companies and the Banking Commission, responsible for the supervision of Belgian banks and the oversight of security issues, was founded (De Voghel, 1941; Willems, 2000). After World War II, investor protection was further improved. From 1953, an external audit of the financial statements was required for all listed companies (Centre d'étude des Sociétés, 1956). The content and layout of the financial statements was further specified in 1975, increasing the financial transparency (Van Damme, 1983). Further, insider trading was abolished and new regulation regarding takeover bids was introduced in the late 1980s (Geens, 1990; Hendrickx and Van gulck, 1991). Apart from these huge changes in the institutional environment, Belgium was also involved in a war twice and several economic crises occurred during our sample period (e.g. Great Depression of 1929, the oil crises of the 1970s, the Great Recession of 2007).

Given that the environment in which firms operate is generally believed to affect the dividend policy of firms (e.g. La Porta et al., 2000), these changes in the environment might have an impact on the persistence of initial dividend policy. Consider for instance the Société Générale, a firm that has its first listing in the early 19th century and is in our sample for more than 150 years. At the moment of its first listing, dividends are likely to be very important for several reasons. First, there was virtually no information available to outside shareholders. As such, paying out a dividends might give a signal about the quality of the firm (e.g. Bhattacharya, 1979; John and Williams, 1985; Miller and Rock, 1985). Second, outside shareholders were virtually unprotected and thus paying out a dividend might alleviate agency conflicts between the management of the firm and its shareholders (e.g. Easterbrook, 1984; Jensen, 1986). Third, in this period, dividends are not taxed and as such, there is no dividend tax penalty (e.g. Brennan, 1970). However, given investor protection improved over time and dividend taxes were introduced in 1920, managers that originally paid a dividend might reconsider their dividend policy because the monitoring role and signalling role of dividends decreases and dividends become less attractive from a tax perspective. However, Marquis

[3] Daily average income of a male adult (older than 16) worker was less than 5 BEF in the 1840s (Neirynck, 1944).

and Tilcsik (2013) argue that imprinting leads to inertia and institutionalization, and as such, the effect of a changing institutional environment on the impact of initial dividend policy is likely to be gradual.

3. Data

We use the database of the Studiecentrum voor Onderneming en Beurs (SCOB) at the University of Antwerp. The data are highly reliable as they are hand-collected and cross-checked using different sources. Information on stock prices, dividend information, the number of stocks outstanding and capital operations for all stocks that were ever listed on the BSE since 1824 is available (Annaert et al., 2012). Stocks are included in the sample if they fulfil several criteria. First, some firms simultaneously have more than one stock outstanding. If this is the case, we only consider the stock with the largest market capitalization. Second, our database differentiates between Belgian firms, colonial firms and foreign firms. We do not consider stocks of foreign firms.

For our sample firms, we collect monthly data on end-of-month stock prices, dividend information (amount of dividend paid, ex-dividend day) and the number of stocks listed on the BSE between 1824 and 2012. Our entire sample contains information on 1,777 Belgian listed firms. Additionally, we also collect inflation data, which are available from 1838. For the period between 1838 and 1920, these data are from Michotte (1937) and Van de Velde (1943). For the period between 1921 and 1939 and as of 1947, CPI data are retrieved from the Ministery of Economic Affairs.

Using these data, we measure two dimensions of dividend policy. We look at the decision to pay and at the decision how much to pay. To measure the decision to pay, we construct a dummy-variable $Payer_{i,t}$, which is equal to 1 if the firm pays a dividend in year *t* and zero otherwise. We use the *Dividends per share*$_{i,t}$ as measure for the magnitude of the dividend. There are at least two arguments why this is a good measure for the decision how much to pay. First, in the beginning of our sample period, there are no publication requirements. As such, dividend payout ratios are not observable for outside shareholders, whereas the dividends per share are publicly available. Given the absence of publication requirements, *Dividends per share*$_{i,t}$ is the best proxy for the decision how much to pay. Second, based on surveys and interviews of financial executives, consistent with dividend smoothing, Brav et al. (2005) show that managers consider the lagged dividend per share as given when they decide how much they will pay. This again indicates that *Divdends per share*$_{i,t}$ is a good measure for how much dividends a firm will distribute.

In Table III − 1 , we give an overview of the evolution of our two dividend measures in each decade of our sample period[4]. The average values in each decade are reported. We find *Payer* to be very stable over our sample period[5]. Over our entire sample period, on average 60% of the companies pays a dividend. Until the outbreak of World War II, *Dividend per share* is also very stable. However, after World War II, the dividend per share increases sharply and in the most recent period (2005−2012), the nominal dividend per share is almost three times as high as in the first decade of our sample period. However, correcting for inflation, we find a huge decrease in the dividend per share over time. We also report the evolution of the average level of the initial dividend policy, measured at the end of the first listing year, which is our main variable of interest. While firms in their first listing years seem on average to be slightly more likely to pay dividends compared to the entire sample, the level of dividends per share is rather comparable in the entire sample and the sample of new lists.

Table III − 1 Evolution of dividend measures This table reports the evolution of the average value of our dividend measures in different decades of our sample. *Payer* is equal to the average propensity to pay among all firms in the sample in a given decade. *Dividend per share (DPS)* is measured as the average nominal amount of dividends distributed in a given decade. We also report the evolution of the average value of the *Real dividend per share.*

	All firms			***First lists***		
	Payer	***DPS***	***Real DPS***	***Payer***	***DPS***	***Real DPS***
1825 – 1834	100.00%	46.83		100.00%	48.65	
1835 – 1844	50.43%	27.34	2,520.19	33.33%	13.98	1,226.16
1845 – 1854	52.94%	26.11	2,536.22	73.33%	34.96	3,249.05
1855 – 1864	76.55%	42.23	3,614.03	69.57%	29.12	2,471.96
1865 – 1874	71.90%	43.73	3,669.10	73.85%	50.35	4,082.68
1875 – 1884	64.57%	32.35	2,810.64	55.36%	14.77	1,295.10
1885 – 1894	72.39%	30.75	3,164.74	84.21%	34.99	3,551.45
1895 – 1904	63.88%	30.47	3,262.92	49.40%	14.71	1,600.25
1905 – 1914	66.82%	28.41	2,735.89	62.18%	16.10	1,553.42
1915 – 1924	42.01%	33.60	730.45	58.64%	37.93	802.36
1925 – 1934	50.40%	48.94	593.62	58.97%	34.70	421.84
1935 – 1944	52.07%	39.20	381.55	88.64%	48.35	570.82
1945 – 1954	66.97%	81.62	252.38	81.08%	61.96	189.45
1955 – 1964	66.81%	106.01	287.90	90.00%	81.01	224.30
1965 – 1974	64.02%	101.86	201.81	92.31%	88.62	179.12
1975 – 1984	62.30%	128.74	131.83	60.00%	208.00	181.89
1985 – 1994	69.64%	154.91	99.34	91.18%	65.93	43.86
1995 – 2004	72.50%	179.34	93.11	68.18%	38.37	20.31
2005 – 2012	61.94%	133.63	58.03	37.70%	7.35	3.27

[4] The Société Générale de Belgique is the first company that enters the sample. This company is incorporated on August 28, 1822. The first recorded share price dates back to November 5, 1824. As such, for this company the initial dividend policy is measured in 1825, which is the reason why the first decade starts in 1825.

[5] Note that in the first decade (1825 – 1934), the Société Générale is the only company that is listed on the BSE. The Société Générale pays a dividend in each year of the first decade, and thus the average propensity to pay is equal to 100%. In the middle of the 1830s, new companies, that do not necessarily pay a dividend, are introduced at the BSE. This explains the huge decrease in the average propensity to pay from the first to the second decade of our sample.

4. The role of initial dividend policy

4.1 The influence of initial dividend policy on future dividend policies

We start our analysis by investigating whether the initial dividend policy has an impact on future dividend policies. Therefore, we estimate following regression model:

$$Y_{it} = \alpha + \beta X_{it-1} + \gamma Y_{i1} + \mu_i + \nu_t + \varepsilon_{i,t}, \quad \text{(III.1)}$$

where Y_{it} is the dividend policy for firm i in year t (*Payer*$_{i,t}$ and *Dividend per share*$_{i,t}$), $X_{i,t-1}$ is the set of lagged control variables that are previously found to affect the decision to pay in our sample. We include Size, Age, Idiosyncratic risk, Share price and Liquidity[6]. Further, Y_{i1} is the initial dividend policy, which is equal to the observation of the dividend variables at the end of the first entire listing year, μ_i are industry-fixed effects. We differentiate between Financials, Transport firms, Coal mines, Steel and Non-ferrous companies, Chemicals, Electricity & Oil and Others. Next, ν_t are year-fixed effects. Finally, ε is a random error term. For *Payer*$_{i,t}$, we estimate a logit model; for *Dividend per share*$_{i,t}$ we use OLS. The first observation for each firm is dropped to avoid an identity at time 1. Coefficient estimates[7], odds ratios (only for *Payer*$_{i,t}$) and HAC standard errors clustered at firm level are reported in Table III − 2[8].

For each dependent variable we first estimate a model in which we only include the initial dividend policy, measured as *Payer*$_{i,t}$ and *Dividend per share*$_{i,t}$ at the end of the first entire listing year. We find the impact of the initial dividend decision is significant at the 1% level. The odds of paying a dividend in the future are almost twice as high for initial dividend payers than for firms that do not pay a dividend in their first listing year. We also find that the impact of the initial dividend per share on the future levels of dividend per share is significant at the 1% level. In the next four models, we introduce firm characteristics, year-fixed effects and industry-fixed effects. Although the coefficient estimate and odds ratio decreases when adding the control variables, the impact of the initial dividend policy remains significant at the 1% level. As a robustness check[9], we estimate the regression for *Dividend per share*$_{i,t}$ only for firms that do pay dividends. The results are very similar.

[6] The control variables are defined in Appendix A at the end of this chapter. The definition of the control variables is similar as in Chapter II of this dissertation.
[7] For *Dividend per share*, coefficient estimates are standardized
[8] If the initial dividend policy in year *t* affects the survival rate of firms going public in year *t*, our results might suffer from survivorship bias. In order to check this, we calculated the correlation between the initial dividend measures as they occur in year *t* and the number of years these firms are in the sample. For the initial decision to pay, this correlation is 0.1664; For the initial dividend per share, this correlation is 0.0667.
[9] Results are reported in the Appendix at the end of this dissertation.

Our results indicates that the dividend policy at the moment of first listing is a significant determinant of future dividend policy, which indicates that the initial dividend policy is an imprinted characteristic. Dividends have thus a very persistent component, which is not taken into account previously.

Table III − 2 The impact of initial dividend policy on future dividend policies We estimate following regression model: $\boldsymbol{Y_{it} = \alpha + \beta X_{i,t-1} + \gamma Y_{i1} + \mu_i + \nu_t + \varepsilon_{i,t}}$. $Y_{i,t}$ measures the dividend policy. We use two different measures for dividend policy. $Payer_{i,t}$, is a dummy-variable equal to one if a firm pays a dividend in year *t* and zero otherwise. $Dividend\ per\ share_{i,t}$ is the total nominal amount of dividends paid by firm *i* in year *t*. We regress the dividend measures on initial dividend policy (Y_{i1}), which is the initial value of the dividend measures and we control for the lagged levels of size, age, idiosyncratic risk, share price and liquidity. We also include year-fixed effects and industry-fixed effects. Standard errors are clustered by firm and HAC-robust.

Panel A: Decision to pay

	(1)	(2)	(3)	(4)	(5)
Coefficient estimates					
Initial payer	0.653***	0.260***	0.268***	0.277***	0.293***
	(0.019)	(0.024)	(0.026)	(0.024)	(0.026)
Size		1.237***	1.559***	1.022***	1.341***
		(0.051)	(0.055)	(0.053)	(0.058)
Age		-0.551***	-0.628***	-0.390***	-0.359***
		(0.042)	(0.044)	(0.044)	(0.047)
Idiosyncratic risk		-1.925***	-2.033***	-1.724***	-1.853***
		(0.045)	(0.048)	(0.047)	(0.050)
Price		2.519***	2.772***	3.068***	3.334***
		(0.053)	(0.056)	(0.058)	(0.063)
Liquidity		0.182***	0.154***	0.190***	0.174***
		(0.004)	(0.005)	(0.004)	(0.005)
Industry FE	No	No	No	Yes	Yes
Year FE	No	No	Yes	No	Yes
Odds ratios					
Initial decision to pay	1.922***	1.297***	1.308***	1.320***	1.340***
Size		3.444***	4.755***	2.778***	3.823***
Age		0.576***	0.533***	0.677***	0.698***
Idiosyncratic risk		0.146***	0.131***	0.178***	0.157***
Share denomination		12.418***	15.984***	21.493***	28.052***
Liquidity		1.199***	1.166***	1.209***	1.190***
Observations	51,570	49,381	49,381	49,381	49,381
Log likelihood	-34189	-24401	-22430	-23913	-21833
pseudo R^2	0.0165	0.267	0.326	0.282	0.344

Panel B: Decision how much to pay

	(1)	(2)	(3)	(4)	(5)
Initial dividend per share	0.195***	0.110***	0.088***	0.109***	0.090***
	(0.018)	(0.019)	(0.019)	(0.019)	(0.019)
Size		-0.053***	-0.027***	-0.062***	-0.033***
		(0.006)	(0.005)	(0.006)	(0.005)
Age		0.039***	0.045***	0.050***	0.042***
		(0.004)	(0.004)	(0.005)	(0.005)
Idiosyncratic risk		0.006	0.021***	0.015***	0.025***
		(0.004)	(0.005)	(0.004)	(0.004)
Share denomination		0.347***	0.353***	0.361***	0.367***
		(0.008)	(0.008)	(0.009)	(0.009)
Liquidity		0.095***	0.017***	0.094***	0.021***
		(0.003)	(0.003)	(0.003)	(0.004)
Industry FE	No	No	No	Yes	Yes
Year FE	No	No	Yes	No	Yes
Observations	51,570	49,381	49,381	49,381	49,381
Adjusted R^2	0.0379	0.154	0.188	0.158	0.191

4.2 Does the impact of initial dividend policy decreases when going through a firm's lifecycle?

Our long sample period allows us to investigate whether the impact of initial dividend policy decreases when a firm goes through its lifecycle. In order to do so, we estimate Equation III.1 by including dummies for the number of decades a firm is listed and interaction effects between our initial dividend policy variable and these decade dummies. In total, we have six different decade variables, where *Decade 1* is equal to 1 for all observations from listing year 2 to listing year 10, and zero otherwise; *Decade 2* is equal to 1 for all observations between listing year 11 and listing year 20 and zero otherwise, and so on. The last decade-variable, *Decade 6,* is equal to 1 for all observations from listing year 50 onwards and zero otherwise. Results are reported in Table III − 3 for $Payer_{i,t}$ and in Table III − 4 for $Dividend\ per\ share_{i,t}$. For space considerations, we do not include the coefficient estimates of the firm characteristics. Complete results are reported in the Appendix C at the end of this dissertation.

For $Payer_{i,t}$ (Table III − 3), we find a positive impact of the initial dividend decision on future dividend decisions, which is in all our models significant at the 1% level. The odds ratio for the initial dividend decision is in all our models almost twice as high compared to the odds ratios in Table III − 2. This is already first evidence that during the first listing decade (the base-decade), the impact of the initial dividend decision is higher. Next, we also find a positive and significant impact of all period dummies. This indicates that a firm is more likely to pay in, for instance, decade 2 compared to in decade 1. The positive impact of these decade dummies suggest that firms become more likely to pay dividends in later stages of their life-cycle. This result is consistent with previous evidence (DeAngelo et al., 2006; Grullon et al., 2002). The interaction effects between the decade dummies and initial dividend policy is also significant at the 1% level. However, caution is necessary when interpreting interaction terms in logit models (Ai and Norton, 2003). Therefore, we calculate the average propensity to pay among all firms that initially paid a dividend and among all firms that initially did not pay a dividend in each decade. Figure III − 1 shows that while the average propensity to pay among firms that initially pay a dividend is approximately equal to 63% in each decade, the propensity to pay among initial non-payers increases decade by decade. In *Decade 1*, the average propensity to pay among initial non-payers is 29.39%, (compared to 67.22% for initial payers). In *Decade 6* (i.e. all observations as from listing year 50), we find that the average propensity to pay among initial payers is 65.80%, whereas for initial non-payers the average propensity to pay is 66.67%. Our finding that the difference between the propensity to pay of initial payers and initial non-payers vanishes over time indicates that the impact of the initial decision to pay dividends on future decisions to pay disappears. This suggests that mangers are at the same time firm and flexible when setting their dividend policy. They do take into account the importance of the imprinted characteristic, but they are also open for changes in dividend policy that are necessary because the company enters a new phase in its life-cycle.

Table III − 3 How long does the initial decision to pay affect future decisions to pay We estimate following regression model: $\boldsymbol{Y_{it} = \alpha + \beta X_{it-1} + \gamma Y_{i1} + \delta_1 Decade_{it} + \delta_2 Y_{i1} \times Decade_{it} + \mu_t + \nu_t + \varepsilon_{i,t}}$. $Y_{i,t}$ measures $Payer_{i,t}$. We regress the decision to pay on the initial decision to pay (Y_{i1}) and we control for the lagged levels of size, age, idiosyncratic risk, share price and liquidity. We also include decade dummies and an interaction effect between decade and the initial dividend policy. Decade1 is equal to 1 for all observations between listing year 2 and listing year 10. Decade2 is equal to 1 for all observations between listing year 11 and listing year 20, and so on. Decade6 is equal to 1 for all observations as from listing year 50. We include year-fixed effects and industry-fixed effects. Standard errors are HAC robust and clustered by firm.

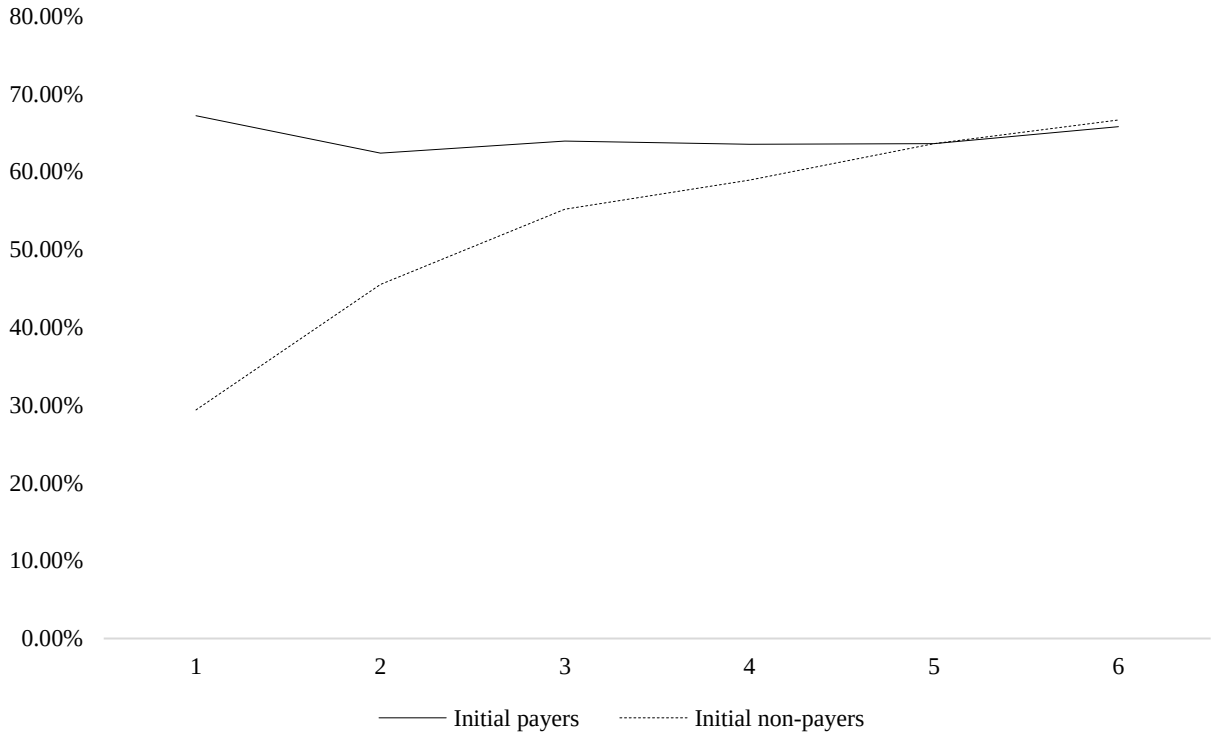
Panel A: Coefficient estimates

	(1)	(2)	(3)	(4)	(5)
Initial decision to pay	1.594***	0.956***	0.968***	0.956***	0.963***
	(0.040)	(0.051)	(0.054)	(0.051)	(0.054)
Decade 2	0.697***	0.555***	0.689***	0.509***	0.644***
	(0.048)	(0.061)	(0.066)	(0.061)	(0.067)
Decade 3	1.086***	0.738***	0.777***	0.670***	0.718***
	(0.052)	(0.066)	(0.075)	(0.067)	(0.076)
Decade 4	1.239***	0.865***	0.983***	0.788***	0.928***
	(0.058)	(0.073)	(0.085)	(0.074)	(0.086)
Decade 5	1.435***	0.843***	0.778***	0.792***	0.760***
	(0.066)	(0.084)	(0.097)	(0.085)	(0.098)
Decade 6	1.570***	0.751***	0.551***	0.655***	0.537***
	(0.053)	(0.071)	(0.087)	(0.073)	(0.090)
Initial decision to pay * Decade 2	-0.908***	-0.611***	-0.676***	-0.608***	-0.669***
	(0.058)	(0.073)	(0.077)	(0.074)	(0.078)
Initial decision to pay * Decade 3	-1.231***	-0.872***	-0.857***	-0.860***	-0.841***
	(0.063)	(0.078)	(0.084)	(0.079)	(0.084)
Initial decision to pay * Decade 4	-1.401***	-1.078***	-1.163***	-1.056***	-1.121***
	(0.070)	(0.085)	(0.092)	(0.086)	(0.092)
Initial decision to pay * Decade 5	-1.594***	-1.165***	-1.156***	-1.158***	-1.118***
	(0.079)	(0.097)	(0.102)	(0.097)	(0.103)
Initial decision to pay * Decade 6	-1.633***	-1.145***	-1.123***	-1.091***	-1.022***
	(0.063)	(0.078)	(0.081)	(0.079)	(0.083)
Firm characteristics	No	Yes	Yes	Yes	Yes
Industry FE	No	No	No	Yes	Yes
Year FE	No	No	Yes	No	Yes
Observations	51,570	49,381	49,381	49,381	49,381
Log likelihood	-33513	-24210	-22203	-23741	-21657
pseudo R^2	0.0360	0.273	0.333	0.287	0.350

Panel B: Odds ratios

	(1)	(2)	(3)	(4)	(5)
Initial decision to pay	4.924***	2.601***	2.633***	2.601***	2.619***
Decade 2	2.007***	1.742***	1.993***	1.663***	1.903***
Decade 3	2.962***	2.092***	2.175***	1.953***	2.051***
Decade 4	3.451***	2.375***	2.673***	2.198***	2.528***
Decade 5	4.201***	2.324***	2.176***	2.208***	2.138***
Decade 6	4.804***	2.120***	1.736***	1.925***	1.710***
Initial decision to pay * Decade 2	0.403***	0.543***	0.509***	0.544***	0.512***
Initial decision to pay * Decade 3	0.292***	0.418***	0.425***	0.423***	0.431***
Initial decision to pay * Decade 4	0.246***	0.340***	0.313***	0.348***	0.326***
Initial decision to pay * Decade 5	0.203***	0.312***	0.315***	0.314***	0.327***
Initial decision to pay * Decade 6	0.195***	0.318***	0.325***	0.336***	0.360***

Figure III − 1 How long does the initial decision to pay affects future decisions to pay? This figure shows the average propensity to pay among initial payers and the average propensity to pay among initial non-payers in different decades after the initial listing year.



For *Dividends per share*$_{i,t}$ (Table III − 4), we find a positive impact of the initial dividend per share on future dividends per share. The standardized coefficient estimates are similar than in Table III − 2, which suggests that for dividend per share, the impact of the initial decision to pay is likely to be more stable over the company's life. For the models without year-fixed effects (Model (1), Model (2) and Model (4)), we find all decade dummies to be positive and significant. This indicates that the dividends per share tends to increase as a firm goes through its lifecycle. However, for the models with year-fixed effects, almost all decade dummies are insignificant. This is interesting as it indicates that mature firms care about paying a dividend, but the amount of dividends paid seems not to be affected by life-cycle arguments. Further, in all models (all our models, except Model (1)), we find the interaction term between the *Initial dividend per share* and *Decade 2* (*Decade 3*) to be insignificant. This indicates that the impact of the initial dividend per share on future dividends per share does not decrease in the first two decades after the initial listing year. However, the interaction term between *Decade 4* and the *Initial dividend per share* and between *Decade 5* and the *Initial dividend per share* is negative, indicating that the impact of the initial dividend per share starts to decrease after the first twenty years of listing.

Table III − 4 How long does the initial dividend per share affect the future dividend per share We estimate following regression model: $\boldsymbol{Y_{it} = \alpha + \beta X_{it-1} + \gamma Y_{i1} + \delta_1 Decade_{it} + \delta_2 Y_{i1} \times Decade_{it} + \mu_t + \nu_t + \varepsilon_{i,t}}$. $Y_{i,t}$ measures the *Dividend per share*$_{i,t}$. We regress the dividend per share on the initial dividend per share (Y_{i1}) and we control for the lagged levels of size, age, idiosyncratic risk, share price and liquidity. We also include decade dummies and an interaction effect between decade and the initial dividend policy. Decade1 is equal to 1 for all observations between listing year 2 and listing year 10. Decade2 is equal to 1 for all observations between listing year 11 and listing year 20, and so on. Decade6 is equal to 1 for all observations as from listing year 50. We include year-fixed effects and industry-fixed effects. Standard errors are HAC robust and clustered by firm.

	(1)	(2)	(3)	(4)	(5)
Initial DPS	0.217***	0.112***	0.086***	0.111***	0.086***
	(0.019)	(0.021)	(0.021)	(0.021)	(0.021)
Decade 2	0.028***	0.028***	-0.003	0.024***	-0.006
	(0.008)	(0.008)	(0.010)	(0.009)	(0.010)
Decade 3	0.104***	0.076***	-0.025**	0.070***	-0.028**
	(0.008)	(0.008)	(0.011)	(0.008)	(0.011)
Decade 4	0.174***	0.145***	0.001	0.138***	-0.002
	(0.012)	(0.011)	(0.016)	(0.012)	(0.016)
Decade 5	0.263***	0.205***	0.015	0.201***	0.014
	(0.015)	(0.014)	(0.020)	(0.014)	(0.020)
Decade 6	0.593***	0.468***	0.157***	0.458***	0.155***
	(0.019)	(0.017)	(0.023)	(0.017)	(0.024)
Initial DPS * Decade 2	0.054	0.079	0.085	0.081	0.086
	(0.067)	(0.069)	(0.068)	(0.068)	(0.068)
Initial DPS * Decade 3	-0.070**	-0.041	-0.044	-0.037	-0.041
	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)
Initial DPS * Decade 4	-0.134***	-0.083***	-0.087***	-0.076***	-0.082***
	(0.022)	(0.023)	(0.023)	(0.022)	(0.023)
Initial DPS * Decade 5	-0.182***	-0.111***	-0.104***	-0.105***	-0.099***
	(0.025)	(0.025)	(0.025)	(0.025)	(0.026)
Initial DPS * Decade 6	-0.020	0.046	0.066*	0.050	0.067**
	(0.034)	(0.033)	(0.034)	(0.033)	(0.034)
Firm characteristics	No	Yes	Yes	Yes	Yes
Industry FE	No	No	No	Yes	Yes
Year FE	No	No	Yes	No	Yes
Observations	51,570	49,381	49,381	49,381	49,381
Adjusted R^2	0.0874	0.175	0.195	0.179	0.179

We thus find that the initial dividend policy has an important impact on the future dividend policies. However, the impact of the initial dividend policy on future dividend policies becomes smaller when a firm goes through its lifecycle. This decreasing impact is more pronounced for the decision to pay than for the magnitude of the dividend payment. This indicates that the decision to pay is more open for changes driven by life-cycle arguments, whereas the magnitude of the dividend payment is very persistent.

5. Robustness checks

5.1 How far does the stable component goes back?

Until now, we argue that the slowly changing component in dividend policy exists from the moment of the firm's first listing. The question is whether this stable component is also present from the moment of incorporation. As accounting data are unavailable, we are able to investigate this only for a sample of firms that have their first listing in the first five years after incorporation. Results are reported in Table III − 5.

Also for firms that have their first listing shortly after incorporation, we find that the initial dividend policy significantly affects the future dividend policies of firms. For $Payer_{i,t}$, we find an odds ratio of 1.8 in Model (1) and an odds ratio of approximately 1.3 for the models in which firm characteristics, year-fixed effects and / or industry-fixed effects are included (Model (2) to Model (5)). As such, also for firms that have their first listing very early in their lifecycle, we find being a payer in the first listing year has a long-lasting impact on being a payer in the future. Also for *Dividends per share*$_{i,t}$, we find a long-lasting impact of the initial dividend per share on the future dividend per share. For the models in which firm characteristics are included, the standardized coefficient estimate for the initial dividend per share is the second largest (the standardized coefficient estimate for share denomination is the largest), which indicates that the initial dividend per share has an important impact on the future dividend per share. As such, our evidence indicates that the stable component in dividend policy is already present from the moment of incorporation and not only from the moment of the first listing.

5.2 Is the stable component affected by World War I and World War II?

World War I and World War II are found to have a huge impact on dividend policy of Belgian listed firms: during both World Wars, the likelihood to pay decreased strongly and dividend yield dropped (Chapter I of this dissertation). As such, it is likely that these two exogenous shocks destroy the relationship between the initial dividend policy and future dividend policies. Given that the impact of initial dividend policy on future dividend policy is the strongest in the first twenty years of listing, the effect of World War I and World War II should be especially strong for firms that go public in the years before the outbreak of a war.

Therefore, we estimate a regression model for all firms that have their first listing in the ten years before the outbreak of a war. For World War I (World War II), we include the observations of the first two decades for firms that enter our sample between 1904 and 1913 (1930 and 1939). We estimate the following model:

$$Y_{it} = \alpha + \beta X_{it-1} + \gamma Y_{i1} + \delta_1 \, World\ War_t + \delta_2 (Y_{i1} \times World\ War_t) + \mu_i + \nu_t + \varepsilon_{i,t}, \quad \text{(III.2)}$$

where $Y_{it}, X_{it-1}, Y_{i1}, \mu_i$ and ν_t are as defined above. *World War* is a dummy-variable equal to one between 1914 and 1918 and zero otherwise for the model for World War I. For the World War II model, this dummy-variable is equal to 1 between 1940 and 1945 and zero otherwise. Finally, to measure how the outbreak of a war affects the impact of the initial dividend policy, we also include an interaction variable between this war dummy and the initial dividend policy. Similar as before, we drop the first observation to avoid a unity at time 1. Results are reported in Table III − 6 for World War I and in Table III − 7 for World War II.

Despite the severe effects of the World Wars on dividend policy of Belgian firms, we still find that the initial dividend policy has a long lasting impact on future dividend policies. For $Payer_{i,t}$ (Panel A), we find that firms going public in the period before World War I, are more likely to pay a dividend in the future if they pay a dividend in their first listing year. The effect of the World War I dummy is negatively significant which indicates that firms are less likely to pay dividends during World War I. The interaction term between the initial decision to pay and the World War I dummy is not significant. For *Dividend per share*$_{i,t}$, we also find a long-lasting impact on the initial dividend per share on the future dividend per share. The effect of World War I on *Dividend per share* seems to be rather limited as the War-dummy is significant only in Model (1). The interaction term between World War I and the initial dividend per share is negative and significant. This indicates that the impact of the initial dividend per share is slightly lower during the war.

For World War II, we find that the initial dividend policy has a long-lasting impact on future dividend policies for all dividend measures. Contrary to World War I, we do not find a huge impact of World War II on the decision to pay and we do find a negative impact on the dividend per share in the models that do not control for year-fixed effects (Model (1), Model (2) and Model (4)). For $Payer_{it}$, and *Dividend per share*$_{i,t}$ the interaction term is found to be significant and negative. Calculating the average propensity to pay among initial payers and among initial non-payers during World War II (1940−1945) and in the non-war years (1930–1939 and 1946−1955) helps us to better understand the interaction between the initial decision to pay and the Second World War. In the non-war period, firms that initially pay a dividend have an average propensity to pay of 74.97%, whereas firms that initially do not pay a dividend have an average propensity to pay of 45.45% in the non-war period. During World War II, the average propensity to pay of initial payers drops to 53.14%, whereas the average propensity to pay of initial non-payers slightly increases to 51.78%. The fact that the difference between the likelihood of paying between initial payers and initial non-payers almost disappears during the Second World War, indicates that the effect of the initial decision to pay on the future decision to pay is destroyed by the outbreak of the war. For *Dividend per share*$_{i,t}$ (Panel B), the interaction effect between the initial dividend policy and the World War II dummy is negative and significant. However, the coefficient estimate is rather small, which indicates that the effect of the initial dividend per share only marginally decreases due to the outbreak of World War II.

Overall, our results indicate that the relationship between the initial dividend policy and future dividend policy is not affected by the outbreak of a World War. Only for World War II, we find that the relationship between the initial decision to pay and the future decisions to pay disappears. This is strong evidence in line with the imprinting theory, as conditions outside the *"period of susceptibility"* (Marquis and Tilcsik, 2013, p. 199) should not change the corporate policy.

Table III − 5 The impact of initial dividend policy on future dividend policy close to incorporation We estimate following regression model: $\boldsymbol{Y_{it} = \alpha + \beta X_{it} + \gamma Y_{i1} + \mu_i + \nu_t + \varepsilon_{i,t}}$ for all firms that have their first listing in the first five years after incorporation. $Y_{i,t}$ measures dividend policy in two different ways. *Decision to pay*$_{,t}$, is a dummy-variable equal to one if a firm pays a dividend in year *t* and zero otherwise. *Dividend per share*$_{i,t}$ is the total nominal amount of dividends paid by firm *i* in year *t*. We regress the dividend measures on the inital dividend policy (Y_{i1}), which is the value of the dividend measures in the first listing year, and we control for size, age, idiosyncratic risk, share price and liquidity. We also include year-fixed effects and industry-fixed. Standard errors are clustered by firm and HAC-robust. We only include firms that go public within the first five years after incorporation.

Panel A: Decision to pay

	(1)	(2)	(3)	(4)	(5)
Coefficient estimates					
Initial decision to pay	0.595***	0.219***	0.210***	0.241***	0.242***
	(0.026)	(0.032)	(0.034)	(0.033)	(0.035)
Size		1.198***	1.552***	0.828***	1.147***
		(0.072)	(0.079)	(0.075)	(0.084)
Age		-0.397***	-0.520***	-0.257***	-0.290***
		(0.059)	(0.063)	(0.062)	(0.067)
Idiosyncratic risk		-2.132***	-2.265***	-1.891***	-2.044***
		(0.064)	(0.068)	(0.066)	(0.071)
Price		2.446***	2.651***	3.158***	3.394***
		(0.075)	(0.082)	(0.084)	(0.092)
Liquidity		0.187***	0.172***	0.195***	0.189***
		(0.005)	(0.008)	(0.005)	(0.008)
Industry FE					
Year FE					
Odds ratios					
Initial decision to pay	1.813***	1.244***	1.234***	1.273***	1.274***
Size		3.313***	4.723***	2.289***	3.147***
Age		0.672***	0.595***	0.773***	0.748***
Idiosyncratic risk		0.119***	0.104***	0.151***	0.130***
Share denomination		11.546***	14.170***	23.519***	29.774***
Liquidity		1.206***	1.187***	1.215***	1.209***
Observations	26,542	25,336	25,336	25,336	25,336
Log likelihood	-17784	-12327	-11269	-12050	-10966
pseudo R^2	0.0153	0.284	0.346	0.300	0.363

Panel B: Dividend per share

	(1)	(2)	(3)	(4)	(5)
Initial dividend per share	0.213***	0.140***	0.125***	0.135***	0.124***
	(0.022)	(0.023)	(0.021)	(0.023)	(0.021)
Size		-0.074***	-0.033***	-0.100***	-0.048***
		(0.007)	(0.006)	(0.007)	(0.007)
Age		0.041***	0.042***	0.051***	0.040***
		(0.007)	(0.007)	(0.007)	(0.007)
Idiosyncratic risk		0.007	0.019***	0.023***	0.028***
		(0.007)	(0.007)	(0.007)	(0.007)
Share denomination		0.370***	0.352***	0.398***	0.374***
		(0.012)	(0.010)	(0.013)	(0.010)
Liquidity		0.093***	0.006	0.091***	0.010**
		(0.003)	(0.004)	(0.003)	(0.004)
Industry FE	No	No	No	Yes	Yes
Year FE	No	No	Yes	No	Yes
Observations	26,542	25,336	25,336	25,336	25,336
Adjusted R^2	0.0454	0.171	0.224	0.179	0.227

Table III − 6 The impact of initial dividend policy on future dividend policies and World War I We estimate following regression model: $\boldsymbol{Y_{it} = \alpha + \beta X_{it} + \gamma Y_{i1} + \delta_1 World\ War_t + \delta_2 (Y_{i1} \times World\ War_t) + \mu_i + \nu_t + \varepsilon_{i,t}}$. $Y_{i,t}$ measures the dividend policy in two different ways. *Decision to pay*$_{i,t}$, is a dummy-variable equal to one if a firm pays a dividend in year *t* and zero otherwise. *Dividend per share*$_{i,t}$ is the total nominal amount of dividends paid by firm *i* in year *t*. We regress the dividend measures on the initial dividend policy (Y_{i1}), which is the value of the dividend measures in the first listing year, and we control for the lagged levels of size, age, idiosyncratic risk, share price and liquidity. We also include year-fixed effects. In order to investigate the effect of a war on the impact of the initial dividend policy, we also include a War-dummy, equal to 1 between 1914 and 1918, and an interaction term between the War dummy and the initial dividend policy in our model. Year-fixed effects and industry-fixed are also included. Standard errors are clustered by firm and HAC-robust. Only firms that go public between 1904 and 1913 are included.

	Panel A: Decision to pay					***Panel B: Dividend per share***				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Coefficient estimates										
Initial dividend policy	1.090***	0.203**	0.258**	0.104	0.154	0.360***	0.137***	0.145***	0.137***	0.146***
	(0.080)	(0.100)	(0.102)	(0.102)	(0.106)	(0.054)	(0.041)	(0.041)	(0.042)	(0.043)
World War I	-1.508***	-0.843***	-0.951*	-0.812***	-2.119***	-0.203***	-0.045	0.011	-0.044	0.025
	(0.167)	(0.225)	(0.545)	(0.235)	(0.721)	(0.035)	(0.034)	(0.064)	(0.034)	(0.056)
Initial dividend policy	-0.088	0.106	0.066	0.085	0.033	-0.010***	-0.010***	-0.010***	-0.010***	-0.010***
* World War I	(0.191)	(0.241)	(0.247)	(0.259)	(0.257)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
Size		1.456***	1.661***	1.275***	1.537***		0.069***	0.052***	0.068***	0.043**
		(0.203)	(0.213)	(0.214)	(0.224)		(0.016)	(0.015)	(0.018)	(0.018)
Age		0.100	0.410*	-0.037	0.372		0.061***	0.012	0.058***	0.002
		(0.206)	(0.223)	(0.215)	(0.236)		(0.015)	(0.012)	(0.016)	(0.014)
Idiosyncratic risk		-2.171***	-2.070***	-2.161***	-2.090***		0.050***	0.040***	0.051***	0.040**
		(0.175)	(0.179)	(0.179)	(0.187)		(0.015)	(0.015)	(0.015)	(0.016)
Price		2.717***	2.657***	3.204***	3.078***		0.376***	0.385***	0.384***	0.400***
		(0.210)	(0.214)	(0.242)	(0.243)		(0.025)	(0.026)	(0.026)	(0.026)
Liquidity		0.224***	0.221***	0.235***	0.238***		0.111***	0.084***	0.112***	0.086***
		(0.008)	(0.010)	(0.008)	(0.011)		(0.011)	(0.014)	(0.011)	(0.014)
Industry FE	No	No	No	Yes	Yes	No	No	No	Yes	Yes
Year FE	No	No	Yes	No	Yes	No	No	Yes	No	Yes
Odds ratios										
Initial dividend policy	2.974***	1.225**	1.295**	1.110	1.167					
World War I	0.221***	0.430***	0.453**	0.444***	0.518*					
Initial DP * WWI	0.916	1.112	1.068	1.089	1.034					
Size		4.288***	5.266***	3.580***	4.650***					
Age		1.105	1.507*	0.964	1.451					
Idiosyncratic risk		0.114***	0.126***	0.115***	0.124***					
Share denomination		15.128***	14.247***	24.638***	21.716***					
Liquidity		1.252***	1.247***	1.265***	1.269***					
Observations	4,230	3,943	3,943	3,943	3,943	4,230	3,943	3,943	3,943	3,943
Log likelihood	-2604	-1811	-1767	-1780	-1733					
pseudo R^2	0.110	0.335	0.351	0.346	0.363					
Adjusted R^2						0.122	0.266	0.284	0.267	0.286

Table III − 7 The impact of initial dividend policy on future dividend policies and World War II We estimate following regression model: $\boldsymbol{Y_{it} = \alpha + \beta X_{it} + \gamma Y_{i1} + \delta_1 World\ War_t + \delta_2 (Y_{i1} \times World\ War_t) + \mu_i + \nu_t + \varepsilon_{i,t}}$. $Y_{i,t}$ measures the dividend policy in two different ways. *Decision to pay*$_{i,t}$, is a dummy-variable equal to one if a firm pays a dividend in year *t* and zero otherwise. *Dividend per share*$_{i,t}$ is the total nominal amount of dividends paid by firm *i* in year *t*. We regress the dividend measures on the initial dividend policy (Y_{i1}), which is the value of the dividend measures in the first listing year, and we control for the lagged levels of size, age, idiosyncratic risk, share price and liquidity. We also include year-fixed effects. In order to investigate the effect of a war on the impact of the initial dividend policy, we also include a War-dummy, equal to 1 between 1940 and 1945, and an interaction term between the War dummy and the initial dividend policy in our model. Year-fixed effects and industry-fixed are also included. Standard errors are clustered by firm and HAC-robust. Only firms that go public between 1930 and 1939 are included.

	Panel A: Decision to pay					***Panel B: Dividend per share***				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Coefficient estimates										
Initial dividend policy	1.279***	0.550***	0.184	0.553***	0.207	0.589***	0.385***	0.370***	0.353***	0.338***
	(0.148)	(0.172)	(0.190)	(0.175)	(0.196)	(0.083)	(0.077)	(0.084)	(0.078)	(0.082)
World War II	0.254	0.288	1.550**	0.348	2.256***	-0.169***	-0.151***	0.134	-0.145***	0.171*
	(0.298)	(0.362)	(0.637)	(0.362)	(0.642)	(0.042)	(0.042)	(0.095)	(0.043)	(0.094)
Initial dividend policy	-1.225***	-1.286***	-1.031**	-1.384***	-1.113**	-0.005***	-0.005***	-0.005***	-0.005***	-0.005***
* World War II	(0.330)	(0.405)	(0.434)	(0.399)	(0.432)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Size		0.864***	1.206***	0.566	0.758*		-0.041*	-0.001	-0.070**	-0.035
		(0.317)	(0.355)	(0.352)	(0.402)		(0.024)	(0.023)	(0.031)	(0.030)
Age		0.140	0.215	0.722*	0.910**		0.121***	0.112***	0.141***	0.132***
		(0.336)	(0.347)	(0.397)	(0.412)		(0.036)	(0.032)	(0.033)	(0.030)
Idiosyncratic risk		-2.099***	-2.458***	-1.917***	-2.253***		0.073***	0.049*	0.073***	0.047*
		(0.271)	(0.308)	(0.286)	(0.318)		(0.027)	(0.029)	(0.028)	(0.027)
Price		1.432***	1.607***	1.833***	2.172***		0.441***	0.423***	0.462***	0.453***
		(0.337)	(0.379)	(0.362)	(0.414)		(0.040)	(0.037)	(0.043)	(0.040)
Liquidity		0.191***	0.166***	0.195***	0.178***		0.088***	0.007	0.089***	0.007
		(0.030)	(0.043)	(0.030)	(0.045)		(0.016)	(0.023)	(0.017)	(0.022)
Industry FE	No	No	No	Yes	Yes	No	No	No	Yes	Yes
Year FE	No	No	Yes	No	Yes	No	No	Yes	No	Yes
Odds ratios										
Initial decision to pay	3.593***	1.733***	1.202	1.739***	1.230					
World War II	1.289	1.333	1.414	1.417	1.517					
Initial DP * WWII	0.294***	0.276***	0.357***	0.251***	0.328***					
Size		2.373***	3.340***	1.760*	2.135**					
Age		1.150	1.240	2.059**	2.484**					
Idiosyncratic risk		0.123***	0.086***	0.147***	0.105***					
Share denomination		4.185***	4.989***	6.253***	8.777***					
Liquidity		1.210***	1.180***	1.216***	1.195***					
Observations	1,337	1,225	1,225	1,225	1,225	1,337	1,225	1,225	1,225	1,225
Log likelihood	-829.2	-638.2	-568.4	-618.1	-547.6					
pseudo R^2	0.0550	0.205	0.292	0.231	0.318					
Adjusted R^2						0.287	0.423	0.488	0.430	0.494

5.3 Does the stable component exist in all time-periods?

As a last robustness check, we investigate whether the initial dividend policy has an impact on future dividend policy in all periods of time. In order to do this, we estimate Equation III.I per listing-cohort. We only include firms that have their first listing in a specific decade (i.e. between year 1xx0 and 1xx9). After World War II, there are few new lists (see Chapter I). Therefore, we estimate our model for all listing-cohorts between 1840 and 1930. As the number of firms having their first listing before 1840 is limited, we include these firms in the 1840 cohort. We only take into account the observations of the first twenty listing years, as considering all observations for each firm hampers the comparability of our results across listing-decades: for firms with their first listing very early in the sample, there are potentially more observations available. As the impact of initial dividend policy on future dividend policy decreases over time, more observations will bias the coefficient estimate downward. As such, limiting our models to include only the first twenty observations, enables us to compare the results for different listing-cohorts. Rather than reporting the entire output, we visualize our results in Figure III − 2[10]. For $Payer_{i,t}$, we report the odds ratio of the initial decision to pay. For *Dividend per share*$_{i,t}$, we report the standardized coefficient estimates. In the model, we also include the other dividend determinants, year-fixed effects and industry-fixed effects. A full mark indicates the odds ratio (coefficient estimate) is significant at conventional levels.

Although there is some variation over time, our results indicate that initial dividend policy has a positive impact on future dividend policy. For $Payer_{i,t}$, the impact of the initial decision to pay dividends is present in all but two listing-cohorts (1880 and 1930). For *Dividends per share*$_{i,t}$, we find a particularly strong impact of the initial dividend per share for firms having their first listing in the 1860s, 1870s, 1890s, 1900s and 1930s.

6. Conclusion

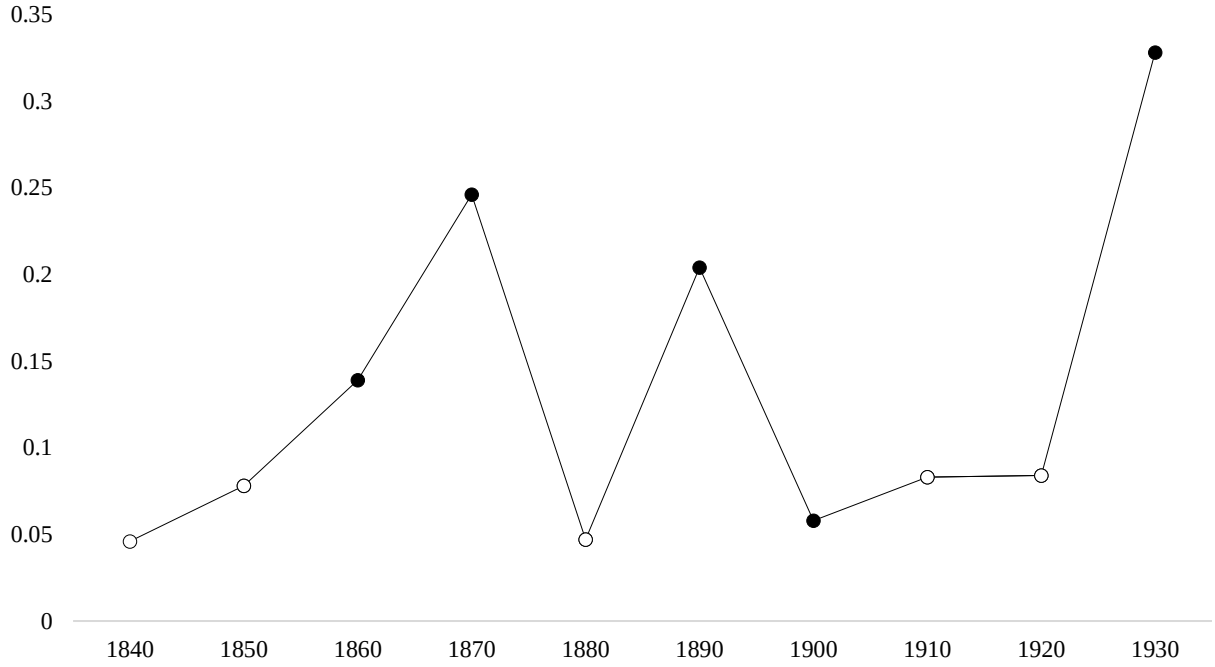
Using a unique sample of all Belgian and Colonial firms ever listed on the BSE since 1825, our study highlights that imprinting has an important impact on dividend policy. While other existing studies have shown that imprinting has an important effect on the capital structure firms (e.g. Hanousek and Shamshur, 2011; Hanssens et al., 2016; Lemmon et al., 2008), we document using almost two centuries of data, that the initial dividend policy, measured as the decision to pay dividends and the dividend per share at the end of the firm's first listing year, has a long lasting impact on future dividend policies. Firms that pay (high) dividends, are more likely to pay dividends (have higher dividends per share) in the future. As such, we introduce an new explanatory variable to the dividend debate that has been ignored until now.

[10] The entire output is reported in Appendix C at the end of this dissertation.

Figure III − 2 The impact of initial dividend policy on future dividend policy per first listing cohort For each dividend measure, we estimate per decade the impact of the initial dividend policy on future dividend policies, controlling for the lagged level of size, age, idiosyncratic risk, share denomination and liquidity. Year-fixed effects and industry-fixed effects are included. We do this for all firms that go public in a given decade and we only include the first twenty observations per firm. Standard errors are clustered at firm level and are HAC robust. For $Payer_{i,t}$, we report the odds ratios; For $Dividend\ per\ share_{i,t}$ standardized coefficient estimates are reported. A full mark indicates the odds ratio/ coefficient estimate is significant, whereas a blank mark indicates the estimate is insignificant at conventional levels.

Panel A: Decision to pay

Panel B: Dividends per share



Although the initial dividend policy has a long-lasting impact on future dividend policy, we show that the impact decreases over the companies life. This is especially true for the decision to pay, and to a smaller extent for the magnitude of the dividend payment. This indicates that the decision to pay is more open for changes driven by life-cycle arguments, whereas the nominal amount of dividends is very persistent. As such, in line with Bamford et al. (2000), who show that the impact of initial conditions on bank performance decreases over time, we find that corporate policies are firm and flexible at the same time.

We document that conditions at the moment of the company's first listing, which is an important milestone in the company's life, has a long-lasting impact. This indicates that imprinting is indeed possible at different moments in the company's life. For a subset of firms that have their first listing very early in their life, we also find evidence of a stable component in dividend policy. As such, our evidence in favour of imprinting at the moment of the first listing and at the moment of incorporation (for a subsample of firms) indicates the possibility of *"generations of imprints that are layered upon one another"* (Marquis and Tilcsik, 2013, p. 195). However, given our limited subsample of firms for which we are able to trace dividend policy back to the moment of incorporation, further research is necessary to explore this issue in more depth. Moreover, investigating imprinting behaviour at other milestones (e.g. mergers or acquisitions) might also increase our understanding of the generations of imprints.

As both capital structure (e.g. Hanousek and Shamshur, 2011; Hanssens et al., 2016; Lemmon et al., 2008) and dividend policy is found to have a stable component, the question arises whether this imprinting behavior is also reflected in other policies, such as the cash management or the working capital management. Additionally, a cross-sectional analysis on the degree of imprinting would also be beneficial to better understand which type of firms are more subject to imprinting, to investigate whether the degree of imprinting is similar for different corporate finance policies or to explore for which companies the impact of imprinting fades away. Finally, although we consider a very long sample-period, we do only briefly touch upon time-varying levels of imprinting. These are all potential avenues for future research.

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Appendix III−A Variable description

Appendix Table III − 1 Variable description of control variables

Control Variable	Description
$Size_{i,t}$	Percentile of BSE firms with the same of lower market capitalization in year t. The market capitalization is measured by the number of stocks outstanding multiplied by the share price
$Age_{i,t}$	Percentile of BSE firms with the same age or a lower age in year t. Age is measured as the number of years since the incorporation.
Idiosyncratic $risk_{i,t}$	Percentile of BSE firms with the same or a lower level of idiosyncratic risk in year t. Idiosyncratic risk is calculated as standard deviation of the residuals of the market model estimated using monthly data of the previous sixty months
Share $denomination_{i,t}$	Percentile of BSE firms with the same or lower share denomination at the end of year *t*. Share denomination is measured by the share price and is a rough proxy for agency conflicts
$Liquidity_{i,t}$	Number of month with non-zero price return in year *t*

Concluding remarks

This PhD dissertation focusses on dividend policy in Belgium between 1824 and 2012. I tackle several important question regarding the dividend policy of firms. In the introductory chapter, I start with the question *"Where do dividends come from?"*. In the early 17th century, companies had a short-term orientation. They were founded to achieve a specific goal, for instance a voyage to Asia, and once this goal was achieved, the company was liquidated. Originally, dividends were thus paid as a liquidation value of the company. However, companies today have a long-term orientation, and still dividends do exists. An important puzzle in the corporate finance literature is why this is the case. In this dissertation, I further investigate this question. More specifically, I start my investigation with the question "*How does the institutional environment affect dividend policy?"* (Study I). Next, I answer the following questions: *"Do the reasons why firms pay dividends depend on the environment in which firms operate?"* (Study II). Finally, I tackle the question "*Is dividend policy driven by a, previously unobserved, stable component?"* (Study III). In order to answer all these questions, I take a long-term perspective and investigate the dividend policy of firms listed on the Brussels Stock Exchange (BSE) between 1824 and 2012, using data of the very unique, high-quality database of the Studiecentrum voor Onderneming en Beurs (SCOB). In this chapter, I will present the conclusions of these empirical studies and I will highlight some avenues for future research.

1. Study I: Investor protection, taxation and dividend policy: Long-run evidence, 1838−2012

In this study, we investigate the link between the institutional environment and dividend policy.

It is generally believed that the institutional environment in which firms operate affects corporate dividend policy (La Porta et al., 2000). Indeed, the commercial legislation has an important impact on the severity of agency conflicts and the level of information asymmetry, which are important reasons to pay dividends (Bhattacharya, 1979; Easterbrook, 1984; Jensen, 1986; John and Williams, 1985; Miller and Rock, 1985). Additionally, the taxation legislation affects the magnitude of the dividend tax penalty, which results from the differential tax treatment between capital gains and dividends (Brennan, 1970). Over time, the institutional environment in which firms operate, changed drastically. At the start of our sample period, investor protection was very weak. There was virtually no information available to outside shareholders and there were no legal means to avoid that managers used their power to extract private benefits of control. Additionally, before World War I, dividends were not taxed. In this institutional environment, it is very likely that dividends are very important. Over time, investor protection improves and dividend taxation is introduced. As such, it is expected that the importance of dividends decreases over time.

Surprisingly, we find dividend policy to be very stable over our sample period. Using a structural break analysis, we show that there are only three breaks in the dividend policy of Belgian listed firms. The first two breaks are situated at the start of World War I and at the end of World War II, whereas the last break is situated in the mid-1980s. By repeating our structural break analysis without the years of World War I (1914−1918) and World War II (1940−1945), we show that the breaks around the outbreak of World War I and the end of World War II disappear. As such, the first two breaks are completely driven by the World Wars. The third break in dividend policy, i.e. the one in the mid-1980s, is found to be driven by the changing composition of firms listed on the BSE. Also in time-series regressions and panel regressions, we find no relationship between changes in commercial legislation and the changes in the tax law on the one hand and corporate dividend policy on the other hand. As dividend taxation is introduced at the end of World War I, we further investigate whether the effect we document is really a war-effect rather than a tax-effect. Based on newspapers published around the time of the introduction of the new taxation system in 1920, we show that the dividend tax turned out to be lower than expected. Additionally, we also find that dividends are not shifted from one year to another to avoid the detrimental tax treatment. As such, we conclude that the wars really had a strong negative impact on dividend policy, whereas commercial legislation and taxation legislation did not have an important impact on dividend policy in our sample.

This raises the question why dividends are so stable over such a long period of time. We offer three potential explanations. First of all, in the 19th and early 20th century, the investor public is limited to the wealthiest families. As such, social control might ensure that managers behave themselves and that shareholders are not easily expropriated, despite the limited level of legal investor protection. Second, similar as in the UK (Acheson et al., 2016), we find that companies voluntarily adopt investor protection in their articles of incorporation. This might indicate that in many cases, investor protection is better than legally required, which as such, decreases the need for dividend payments. Finally, although the level of investor protection changed over time, it might also be that the perception of what good investor protection is, also changed over time. For instance, compared to the UK, Belgium is ill-protected as well in historical capital markets as in contemporary capital markets (e.g. La Porta et al., 2000; Théate, 1905). As such, Belgian investors today might still consider themselves as ill-protected and thus the dividend payment today might be equally important as the dividend payment in the past.

2. Study II: Why do firms pay dividends? 175 years of evidence

In this empirical study, we investigate whether the determinants of dividend policy are common in different environments. We consider differences in the institutional environment, differences in the state of the economy and differences in industry maturity.

It is likely that firms pay dividends for different reasons depending on the environment in which they operate. Consider for instance the signalling role of dividends and its importance in (1) different institutional settings, (2) different states of the economy and (3) in different stages of the industry lifecycle. In historical capital markets, dividends are often the only piece of reliable information about the company's performance that is available to outside investors, whereas today, different sources of information (e.g. audited financial accounts, financial analyst forecasts) are available. As such, the signalling role of dividends is likely to be more prevalent in historical capital markets. Similarly, in times of economic downturn, the signalling cost of dividends is higher than in times of economic prosperity and as such, the signalling role of dividends is also likely to depend on the state of the economy. Finally, in young industries, information asymmetry is typically high, and as such the signalling role of dividends is strong.

We find common determinants of dividend policy in different institutional settings, during different states of the economy and at different phases in the industry life-cycle. Larger firms, firms with a lower level of idiosyncratic risk, firms with a higher share denomination and more liquid firms are more likely to pay dividends. Additionally, firms with a lower level of idiosyncratic risk smooth their dividends more. Moreover, we show that the majority of dividends is paid by a minority of large firms.

Our results cast doubt about signaling as a first-order determinant of dividend policy. If managers pay dividends for signaling reasons, especially firms with a high level of idiosyncratic risk should be more likely to pay dividends and should smooth more. We find the opposite to be true. Additionally, if signaling motives were important, dividends would not be concentrated in the hands of large, well-known companies. The finding that large firms are more likely to pay dividends and the finding of dividend concentration are in line with the life-cycle hypothesis of dividends, as large firms are typically more mature. Further, our results are not in line with the home-made dividend proposition, catering theory and prospect theory.

3. Study III: Persistence of dividend policy: Long-run evidence

The capital structure of firms is found to be driven by an unobserved component that is very stable over time (e.g. Hanousek and Shamshur, 2011; Hanssens et al., 2016; Lemmon et al., 2008). For dividend policy, there is substantial evidence on a short-term stickiness (e.g. Brav et al., 2005; Lintner, 1956). Given that the capital structure and the payout decision are inseparable and given this short-term stickiness, a logical question is whether dividends are also driven by a stable component in the long run. However, if companies aim for a stable capital structure, changes in the company's resources imply, ceteris paribus, a flexible payout policy. Focusing on firms listed on the BSE since 1824, this paper investigates whether the dividend policy at the moment of a company's first listing has a long-lasting impact on future dividend policies.

Based on life-cycle theory of dividends (e.g. DeAngelo et al., 2006; Grullon et al., 2002), the dividend policy evolves during the life of the firm. As such, the dividend policy at the moment of first listing is unlikely to have a long-lasting impact. However, the imprinting theory suggests that *"during a brief period of susceptibility, a focal entity develops characteristics that reflect prominent features in the environment, and these characteristics continue to persist despite significant environmental changes in subsequent periods"* (Marquis and Tilcsik, 2013, p. 199). As such, based on imprinting theory, it is expected that dividend policy at the moment of first listing has a long-lasting impact on future dividend policy.

Our results find evidence in line with imprinting and with life-cycle considerations. We show the initial dividend policy has a long-lasting impact on future dividend policies but its impact decreases when a firm goes through its lifecycle. Firms paying a dividend in the first year of listing are more likely to pay dividends in the future. For the decision to pay, the impact of the first dividend decision fades away after two decades. We also find that paying a high dividend in the first listing year has a positive impact on future dividends. This effect is persistent during the first four listing decades. Our results thus indicate that dividend policy has a very persistent component, which previous research did not take into account. However, at the same time, managers are also open for changing the dividend policy over the life of the firm.

4. Contributions and avenues for future research

This PhD dissertation focusses on dividend policy in the long-run. Going back in time and investigating dividends over almost two centuries has offered important contributions to the literature.

First, our long-run analysis enables us to investigate how dividend policy is related to the environment in which firms operate (Study I). As the institutional environment changes slowly, other research on the relationship between dividends and the institutional environment typically exploit cross-country differences in the level of investor protection to investigate this relationship (e.g. La Porta et al., 2000). Bank et al. (2009) use a long-run analysis to examine the relationship between dividend policy and the political environment, the legal level of investor protection and taxation regulation, but they only consider the effect of changes in the environment on the aggregate level of dividends. We extend the Bank et al. (2009) analysis by more than one century and we also consider multiple dimensions of corporate dividend policy.

Second, investigating dividend policy over such a long period also enables us to explore how the environment affects the reasons why firms pay dividends (Study II). Previous studies only find evidence

that the determinants of the dividend decision are common across different countries (e.g. Denis and Osobov, 2008), which indicate that the institutional environment does not affect the motives to pay dividends. There is, however, no evidence whether firms pay dividends for the same reasons in economic downturn relative to periods of economic prosperity nor whether the maturity of the industry affects the motives to pay out a dividend. Our long-term analysis is particularly suited to investigate this issue.

Finally, we contribute to the dividend literature by adding a new explanatory variable to the debate: the initial dividend policy. Our long-run analysis enables us to measure the initial dividend policy consistently for all firms at the same moment in their life. Current literature on the long-lasting impact of the initial leverage ratio focusses on the leverage ratio at the moment the firm first appeared in the sample (e.g. Lemmon et al., 2008), which is not necessarily the moment of first listing, or only consider firms that are incorporated in a limited number of years (e.g. Hanssens et al., 2016).

Our research offers important new insights in the dividend policy of firms listed on the BSE. In summary, stability seems to be the common denominator. Study I shows dividend policy is very stable over time. In Study II, we show the determinants of the decision to pay are stable over our sample period. Finally, Study III shows that dividend policy has a very stable component that persist over a company's life.

Although this PhD dissertation provides new insights on corporate dividend policy, there are still many avenues for future research. For instance, a more in depth study of dividend policy during both World Wars is recommended. Additionally, this PhD dissertation focusses only on dividend policy, whereas dividends are clearly related to other corporate finance policies. Investigating this link is also interesting. Finally, the findings of the third study raise different questions. Given that both dividend policy and capital structure are found to be driven by imprinting, the question arises whether imprinting behavior is also reflected in other policies, such as the cash management or the working capital management. Additionally, a cross-sectional analysis on the degree of imprinting would also be beneficial. It enables us to better understand which type of firms are more subject to imprinting, to investigate whether the degree of imprinting is similar for different corporate finance policies, or to explore for which companies the impact of imprinting fades away. Finally, although we consider a very long sample-period, we do only briefly touch upon time-varying levels of imprinting. It would for instance be interesting to investigate whether imprinting behavior is stronger in times of economic expansion than in times of economic recession.

The important thing is not to stop questioning. Curiosity has its own reason for existing.
(Albert Einstein)

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Appendix A: Additional results for Study I

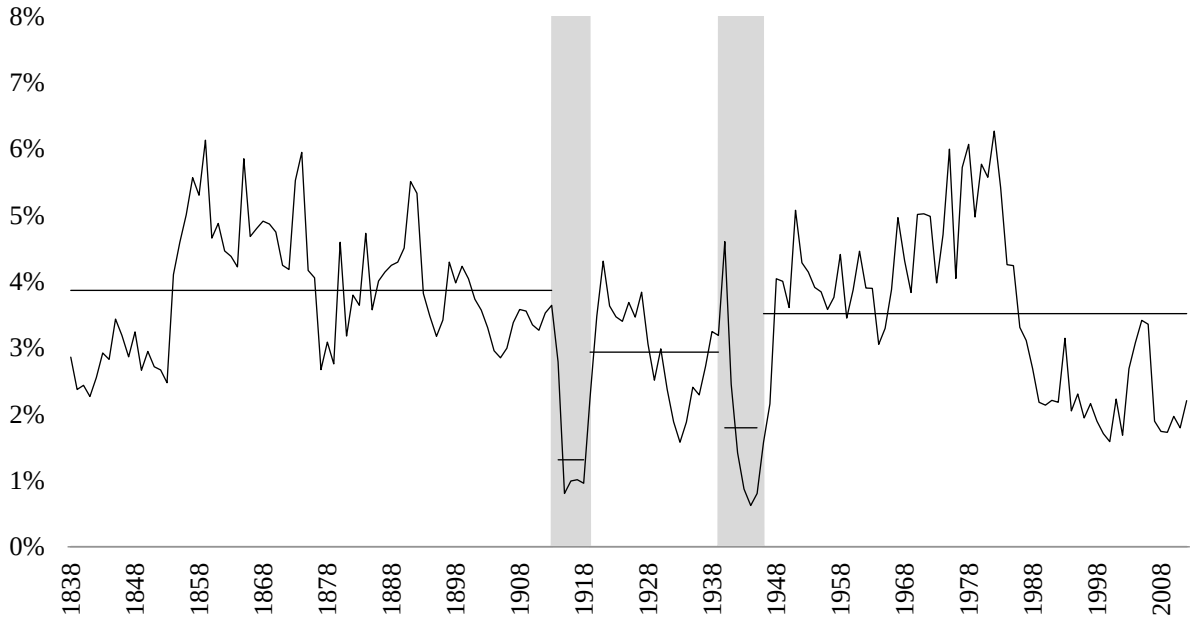
This appendix contains the results of all the unreported analyses. The first section focusses on the equally-weighted dividend yield. As well the evolution of the equally-weighted dividend yield as the results of the structural break analysis are included. In section 2 we focus on long-lived firms. The last section focusses on the results of the regression analyses in which we link dividend policy to firm characteristics and the macro-economic environment.

1. Equally-weighted dividend yield

1.1 Evolution

Appendix A − Figure 1 and Appendix A − Table 1 describe the evolution of the equally-weighted dividend yield. On average, the equally-weighted dividend yield over the entire period is 3.48%. In the pre-World War I-era (1838-1913), the equally-weighted dividend yield is 3.87%. During World War I (1914-1918), the Interbellum (1919-1939) and World War II (1940-1945), the equally-weighted dividend yield drops drastically (to 1.31%, 2.94% and 1.79% respectively). After World War II, the average equally-weighted dividend yield increases again to 3.52%. The evolution of the equally-weighted dividend yield is very comparable to the evolution of the value-weighted dividend yield as described in the paper.

Appendix A − Figure 1 Evolution of the equally-weighted dividend yield, 1838−2012. This figure shows the evolution of the equally-weighted dividend yield between 1838 and 2012. The horizontal lines represent the mean of the dividend yield in different periods (1838−1913; 1914−1918 (World War I, shaded area); 1919−1939; 1940−1945 (World War II, shaded area); 1946−2012).



Appendix A − Table 1 The evolution of the equally-weighted dividend yield, 1838−2012 This table shows how the equall-weighted dividend yield of listed Belgian firms evolve over the period 1838−2012. We divide this period in five different subperiods: 1838−1913; 1914−1918; 1919−1939; 1940−1945; 1946−2012. Mean, median and standard deviation are reported

	1838-2012	1838-1913	1914-1918	1919-1939	1940-1945	1946-2012
Mean	3.48%	3.87%	1.31%	2.94%	1.79%	3.52%
Median	3.48%	3.76%	0.99%	3.06%	1.14%	3.61%
St.Dev	1.23%	0.94%	0.83%	0.73%	1.53%	1.31%

1.2 Structural break analysis

In order to formally test whether the equally-weighted dividend yield changes drastically over the period under investigation, we perform a structural break analysis. Appendix A − Table 2 contains the summarized results of the structural break analysis. In first instance, we perform a structural break analysis for the entire period. Three breaks are found (Panel A): in 1913, in 1947 and in 1985. These results are thus very comparable to the break dates we find for the value-weighted dividend yield (1914, 1947 and 1986). In the pre-World War I era, the equally-weighted dividend yield is 3.87%; in the war period, the equally-weighted dividend yield is 2.43%. It is again higher in the early post-war period (4.46%) and drops in the late-post-war period (2.31%). As in the paper, we repeat the structural break analysis without the war-years (1914-1918; 1940-1945; Panel B): only the break in the mid-1980s remains. We thus show that the first two breaks in the equally-weighted dividend yield are caused by the world wars. Appendix A − Table 3 contains the entire output of the structural break analysis. We refer to the Appendix of the paper for the interpretation of this output.

Appendix A − Table 2 Structural break analysis (summarized results) In this table, the results of the structural break analysis are summarized. The break points, the different periods and the parameter estimates in these periods are shown.

Panel A: Equally-weighted dividend yield (world wars included)				
Break points	1913, 1947, 1985			
Periods	1838-1913	1914-1947	1948-1985	1986-2012
Parameter estimates	3.87%	2.43%	4.46%	2.31%
Panel B: Equally-weighted dividend yield (world wars excluded)				
Break points	1987			
Periods	1838-1987	1988-2012		
Parameter estimates	3.85%	2.24%		

Appendix A − Table 3 Structural break analysis (entire output)

Panel A: Equally-weighted dividend yield (world wars included)				
		Specifications		
z_t = (1)	q = 1	p = 0	h = 26	M = 5
		Tests		
$SupF_T(1)$	$SupF_T(2)$	$SupF_T(3)$	$SupF_T(4)$	$SupF_T(5)$
18.23	24.17	19.99	17.75	13.83
(***)	(***)	(***)	(***)	(***)
$SupF_T(2\|1)$	$SupF_T(3\|2)$	$SupF_T(4\|3)$	$SupF_T(5\|4)$	
5.65	3.94	0.25	0	
Udmax	Wdmax			
24.17	24.17			
(***)	(***)			
		Number of breaks selected		
Sequential procedure		1		
LWZ		3		
BIC		3		
		Estimates with three breaks		
$\widehat{\delta_1}$	$\widehat{\delta_2}$	$\widehat{\delta_3}$	$\widehat{\delta_4}$	
0.0387	0.0243	0.0446	0.0231	
(0.0010)	(0.0015)	(0.0015)	(0.0018)	
$\widehat{T_1}$	$\widehat{T_2}$	$\widehat{T_3}$		
1913	1947	1985		
Panel B: Equally-weighted dividend yield (world wars excluded)				
		Specifications		
z_t = (1)	q = 1	p = 0	h = 25	M = 5
		Tests		
$SupF_T(1)$	$SupF_T(2)$	$SupF_T(3)$	$SupF_T(4)$	$SupF_T(5)$
35.21	25.94	19.90	18.16	13.74
(***)	(***)	(***)	(***)	(***)
$SupF_T(2\|1)$	$SupF_T(3\|2)$	$SupF_T(4\|3)$	$SupF_T(5\|4)$	
4.71	3.42	0.55	0	
UDmax	WDmax			
35.21	35.21			
(***)	(***)			
		Number of breaks selected		
Sequential procedure		1		
LWZ		3		
BIC		3		
		Estimates with one breaks		
$\widehat{\delta_1}$	$\widehat{\delta_2}$			
0.0385	0.0224			
(8.20 e^{-4})	(0.0019)			
$\widehat{T_1}$				
1987				

*, ** and *** represent significance at 10%, 5% and 1%.

2. Long-lived firms

In this analysis, we repeat the structural break analysis for long-lived firms. We consider a firm to be long-lived if it is in the sample for at least half the sample period (i.e. at least 88 years). Focusing on this subsample of 98 firms allows us to investigate dividend policy for a homogeneous sample. Moreover, these firms are really exposed to the altering institutional environment. For these firms, we calculate the *Propensity to pay*$_{all\ stocks}$ and the *Value-weighted dividend yield*. We do not calculate the other dividend measures since the sample is in many years too small to calculate these variables. The summarized results are reported in Appendix A − Table 4, the entire output is shown in Appendix A − Table 5.

Appendix A − Table 4 Structural break analysis (summarized results) In this table, the results of the structural breaks are summarized. For each dividend measure, the break points, the different periods and the parameter estimates in the different periods are shown

Panel A: Propensity to pay (long-lived firms)	
Break points	No breaks
Periods	1838-2012
Parameter estimates	73.61 %
Panel B: Value-weighted dividend yield (long-lived firms)	
Break points	No breaks
Periods	1838-2012
Parameter estimates	4.11 %

Appendix A − Table 5 Structural break analysis (entire output)

Panel A: Propensity to pay (long-lived firms)

Specifications				
z_t = (1)	q = 1	p = 0	h = 26	M = 5
Tests				
$SupF_T(1)$	$SupF_T(2)$	$SupF_T(3)$	$SupF_T(4)$	$SupF_T(5)$
0.84	0.74	1.66	2.04	1.19
$SupF_T(2\|1)$	$SupF_T(3\|2)$	$SupF_T(4\|3)$	$SupF_T(5\|4)$	
1.42	1.42	0.29	0	
Udmax	Wdmax			
2.04	2.04			

Number of breaks selected	
Sequential procedure	0
LWZ	0
BIC	3

No breaks selected

Panel B: Value-weighted dividend yield (long-lived firms)

Specifications				
z_t = (1)	q = 1	p = 0	h = 26	M = 5
Tests				
$SupF_T(1)$	$SupF_T(2)$	$SupF_T(3)$	$SupF_T(4)$	$SupF_T(5)$
3.39	3.20	3.32	3.62	2.71
$SupF_T(2\|1)$	$SupF_T(3\|2)$	$SupF_T(4\|3)$	$SupF_T(5\|4)$	
1.86	2.02	0.10	0	
UDmax	WDmax			
3.62	3.62			

Number of breaks selected	
Sequential procedure	0
LWZ	3
BIC	3

No breaks selected

*, ** and *** represent significance at 10%, 5% and 1%.

3. Firm characteristics, the macroeconomic environment and dividend policy

In this section, we include all the results of the regression analyses as described in paragraph 6 of the paper. Appendix A − Table 6 shows the entire output of the base regression. Appendix A − Table 7 to Appendix A − Table 9 contain the results of all robustness checks. Panel A shows the results of the regression analyses. $Payer_{all\ stocks}$ is equal to 1 if a stock pays a dividend in year t and 0 otherwise. *Initiate* is equal to 1 if a stock that did not pay a dividend in year t-1 does pay a dividend in year t and 0 otherwise. *Coninue* is equal to 1 if a stock that did pay a dividend in year t-1 does also pay a dividend in year t. $Payer_{new\ stocks}$ considers only newly listed stocks and is equal to 1 if a new stock pays a dividend in year t and 0 otherwise. *Dividend yield* measures the dividend yield of a stock (in %). As well coefficient estimates, significance levels (*, ** and *** represent significance of 10%, 5% and 1% respectively) as standard errors (between parentheses) are reported. Standard errors are clustered by as well firm as year (Petersen, 2009). In Panel B, the results of the Wald-tests (χ^2-statistics and their significance level) are reported. If the Wald-test rejects the null hypotheses of equality of the period dummies, Panel C reports the results of the pairwise t-tests: - means that the dividend measure is significantly lower in the oldest of the two periods, + means that the dividend measure is significantly higher in the oldest of the two periods and N.S. means that the difference is not significant.

3.1 Coefficient estimates of control variables

Appendix A − Table 6 Dividend policy controlling for firm characteristics and macro-economic variables, including coefficient estimates of control variables

Panel A: Regression analysis

	$Payer_{all\ stocks}$	*Initiate*	*Continue*	$Payer_{new\ stocks}$	*Dividend yield*
	(1)	(2)	(3)	(4)	(5)
World War I	-2.655	-2.003	3.142*	-33.723***	2.645**
	(1.998)	(2.338)	(1.820)	(1.404)	(1.138)
Interbellum	-1.601	-0.117	4.292**	1.071	2.035
	(1.643)	(1.597)	(1.741)	(1.334)	(1.549)
World War II	5.501***	6.182***	11.327***		9.860***
	(1.999)	(2.111)	(1.743)		(1.924)
Early post-war	0.955	4.550**	6.821***	2.107	2.758
	(1.830)	(1.970)	(2.148)	(2.720)	(1.991)
Late post-war	3.222	6.672*	7.496	-1.645	-1.318
	(3.592)	(3.674)	(4.712)	(1.331)	(2.996)
Age	0.008	-0.561***	-0.190**		-0.140
	(0.082)	(0.084)	(0.096)		(0.114)
Age * World War I	-0.527***	-0.107	-0.068		-0.331
	(0.141)	(0.301)	(0.144)		(0.166)
Age * Interbellum	-0.511***	-0.190	-0.325**		-0.008
	(0.150)	(0.152)	(0.128)		(0.175)
Age * World War II	-0.827***	-0.672**	-0.480*		-0.420
	(0.264)	(0.318)	(0.264)		(0.278)
Age * early post-war	-1.469***	-1.319***	-0.975***		-0.085
	(0.336)	(0.341)	(0.260)		(0.266)
Age * late post-war	-0.789***	-1.037**	0.517		0.658
	(0.392)	(0.529)	(0.447)		(0.393)

Size	1.232***	1.016***	1.260***	0.097*	0.610***
	(0.087)	(0.083)	(0.114)	(0.057)	(0.114)
Size * World War I	0.0310	-0.032	-0.420***	2.081***	-0.361***
	(0.104)	(0.136)	(0.112)	(0.091)	(0.101)
Size * Interbellum	0.027	-0.031	-0.356***	-0.077	-0.215**
	(0.108)	(0.102)	(0.112)	(0.085)	(0.105)
Size * World War II	-0.450***	-0.398***	-0.842***		-0.703***
	(0.099)	(0.130)	(0.096)		(0.094)
Size * early post-war	0.0404	-0.082	-0.379***	-0.097	-0.230**
	(0.097)	(0.097)	(0.111)	(0.146)	(0.112)
Size * late post-war	-0.257	-0.288**	-0.520**	0.017	-0.299***
	(0.171)	(0.140)	(0.228)	(0.074)	(0.114)
Inflation	0.752	1.020**	0.537	-0.104	0.628
	(0.584)	(0.512)	(0.572)	(0.627)	(0.661)
Short-term interest rate	-0.002	0.025	-0.010	-0.006	0.110***
	(0.029)	(0.032)	(0.028)	(0.054)	(0.035)
Estimated model	Logit	Logit	Logit	Logit	OLS
Observations	50.908	19,343	30,018	1,995	55,103
R^2					17.66%
Pseudo-R^2	37.38%	23.54%	22.95%	2.28%	

3.2 Robustness check I – $payer_{new\ firms}$ instead of $payer_{new\ stock}$

Appendix A − Table 7 Propensity to pay of newly listed firms, controlling for size, inflation, short-term intrest rates and firm-fixed effects.

Panel A: Regression analysis		
	$Payer_{new\ firms}$ (1)	$Payer_{new\ firms}$ (2)
World War I	-31.483***	-7.886***
	(0.887)	(0.117)
Interbellum	1.428	-0.117
	(1.446)	(0.225)
Early post-war	0.681	0.141
	(3.262)	(0.386)
Late post-war	-1.525	-0.978**
	(2.009)	(0.420)
Size	0.091	-4.859***
	(0.057)	(1.835)
Size * World War I	1.967***	339.28***
	(0.060)	(1.943)
Size * Interbellum	-0.098	-1.749
	(0.093)	(4.293)
Size * early post-war	-0.023	32.791
	(0.173)	(26.502)
Size * late post-war	0.008	-1.990
	(0.113)	(5.792)
Inflation	0.020	0.108
	(0.746)	(0.730)
Short-term interest rate	-0.011	0.012
	(0.065)	(0.059)
Estimated model	Logit	Logit
Observations	1,756	1,756
Pseudo-R^2	2.08%	2.30%
Panel B: Wald Tests		
	$Payer_{new\ firms}$ (1)	$Payer_{new\ firms}$ (2)
All period-dummies	1034.95***	2627.68***
World wars excluded	1.87	4.76*

3.3 Robustness check II – measuring age and size differently

Appendix A − Table 8 Dividend policy controlling for firm characteristics and macro-economic variables We calculate firm size as the percentile of BSE firms that have the same or a smaller market capitalization. We calculate firm age in a similar way.

Panel A: Regression analysis

	Payer$_{all\ stocks}$	*Initiate*	*Continue*	*Payer*$_{new\ stocks}$	*Dividend yield*
	(1)	(2)	(3)	(4)	(5)
World War I	-2.735**	-2.529**	-2.505***	-7.959***	-2.165***
	(0.920)	(0.842)	(0.688)	(0.132)	(0.561)
Interbellum	-0.400	0.788	0.101	-0.139	-0.476
	(0.477)	(0.481)	(0.451)	(0.213)	(0.491)
World War II	0.206	1.513*	0.393		-0.568
	(0.713)	(0.746)	(0.743)		(0.614)
Early post-war	0.762	2.309**	0.974	0.426	0.946
	(0.685)	(0.745)	(0.637)	(0.341)	(0.702)
Late post-war	1.154	2.351*	1.540**	-1.185***	-1.759
	(0.819)	(0.949)	(0.762)	(0.312)	(1.014)
Age	-0.297	-1.967***	-0.764***		-0.348
	(0.305)	(0.370)	(0.293)		(0.411)
Age * World War I	-0.591	-0.090	0.084		-0.125
	(0476)	(0.687)	(0.494)		(0.463)
Age * Interbellum	-1.212*	-1.272*	-1.297**		-0.671
	(0.599)	(0.615)	(0.540)		(0.624)
Age * World War II	-1.522*	-1.809*	-1.247*		-1.484*
	(0.751)	(0.857)	(0.750)		(0.721)
Age * early post-war	-2.248**	-2.723***	-1.656**		-1.605*
	(0.750)	(0.767)	(0.682)		(0.743)
Age * late post-war	-1.068	-2.064	_0.683		0.313
	(0.840)	(1.077)	(0.791)		(0.949)
Size	6.737***	5.540***	4.878***	-4.517	2.537***
	(0.451)	(0.481)	(0.395)	(1.712)	(0.460)
Size * World War I	-1.023	-0.981	-1.559***	328.146***	-1.387**
	(0.536)	(0.731)	(0.523)	(3.215)	(0.531)
Size * Interbellum	-0.490	-0.640	-0.580	-0.661	0.227
	(0.505)	(0.473)	(0.479)	(3.580)	(0.495)
Size * World War II	-2.484*	-2.467**	-2.790***		-1.480
	(0.772)	(0.895)	(0.606)		(1.159)
Size * early post-war	0.388	-0.411	-0.236	7.478	0.3220
	(0.548)	(0.554)	(0.443)	(20.085)	(0.559)
Size * late post-war	0.277	0.522	-1.107*	6.748*	0.422
	(0.671)	(0.821)	(0.648)	(2.815)	(0.709)
Inflation	1.043	1.43**	0.921*	0.004	0.944
	(0.593)	(0.504)	(0.555)	(0.619)	(0.622)
Short-term interest rate	0.034	0.016	0.003	0.012	0.136***
	(0.023)	(0.024)	(0.023)	(0.053)	(0.032)
Estimated model	Logit	Logit	Logit	Logit	OLS
Observations	51,325	19,487	30,345	1,997	55,472
R^2					17.05%
Pseudo-R^2	35.52%	21.14%	20.05%	2.41%	

Panel B: Wald Tests

	Payer$_{all\ stocks}$	*Initiate*	*Continue*	*Payer*$_{new\ stocks}$	*Dividend yield*
	(1)	(2)	(3)	(4)	(5)
All period-dummies	16.28***	29.72***	21.97***	2,585.67***	27.58***
World wars excluded	10.20***	13.65***	8.02**	15.75***	16.18***

Panel C: Pairwise t-tests				
***Payer**$_{all\ stocks}$* **(1)**	Interbellum	World War II	Early post-war	Late post-war
World War I	-***	-***	-***	-***
Interbellum		N.S.	-***	-**
World War II			N.S.	N.S.
Early post-war				N.S.
Initiate **(2)**	Interbellum	World War II	Early post-war	Late post-war
World War I	-***	-***	-***	-***
Interbellum		N.S.	-***	-**
World War II			-*	N.S.
Early post-war				N.S.
Continue **(3)**	Interbellum	World War II	Early post-war	Late post-war
World War I	-***	-***	-***	-***
Interbellum		N.S.	-**	-***
World War II			N.S.	N.S.
Early post-war				N.S.
***Payer**$_{new\ stocks}$* **(4)**	Interbellum	World War II	Early post-war	Late post-war
World War I	-***		-***	-***
Interbellum			N.S.	+***
World War II				
Early post-war				+***
Dividend yield **(5)**	Interbellum	World War II	Early post-war	Late post-war
World War I	-***	-***	-***	N.S.
Interbellum		N.S.	-***	N.S.
World War II			-***	N.S.
Early post-war				+***

3.4 Robustness check III – taxation

In this regression, we include three taxation variables: the direct dividend tax rate, which is equal to the dividend taxation rate, the personal tax-dummy, which is one whenever a shareholder had to pay an additional tax on the dividend and zero otherwise, and an interaction variable between the previous two measures. Standard errors are clustered by as well firm as year (Petersen, 2009).

Appendix A − Table 9 Dividend policy controlling for firm characteristics (age, size and firm fixed effects), macro-economic varaiables and the taxation system

	***Payer**$_{all\ stocks}$* **(1)**	***Initiate*** **(2)**	***Continue*** **(3)**	***Payer**$_{new\ stocks}$* **(4)**	***Dividend yield*** **(5)**
Ln(age)	-0.468***	-1.061***	-0.775***		-0.509***
	(0.084)	(0.068)	(0.097)		(0.116)
Ln(size)	0.737***	0.730***	0.713***	0.025	0.246***
	(0.086)	(0.063)	(0.097)	(0.034)	(0.068)
Direct dividend tax rate (ddt)	-2.401	1.394	-1.120	-0.493	1.001
	(1.662)	(1.061)	(1.837)	(1.031)	(1.623)
Personal income tax dummy (pit)	0.216	1.828**	0.527	0.439	0.615
	(0.406)	(0.631)	(0.557)	(0.291)	(0.558)
Ddt * pit	-0.236	-7.456*	-1.628	-1.828	1.566
	(2.110)	(3.368)	(2.794)	(1.575)	(3.761)
Inflation	-1.143	-0.240	-1.621*	-0.358	-1.351*
	(0.628)	(0.323)	(0.638)	(0.596)	(0.562)
Interest rate	-0.031	-0.017	-0.014	-0.041	0.078
	(0.038)	(0.031)	(0.038)	(0.057)	(0.047)
Estimated model	Logit	Logit	Logit	Logit	OLS
Observations	54,250	19,344	30,019	2,003	55,288
R^2					
Pseudo-R^2	28.10%	20.54%	16.35%	0.13%	

Appendix B: Additional results for Study II

1. Firm characteristics of always payers and never payers

In each subperiod, firms are classified as an Always payer (Never payer) if they pay a dividend (do not pay a dividend) in each year that they are in the sample. Then, we calculate the median firm characteristics per subperiod. We find always payers to be larger and older than never payers. Always payers face less idiosyncratic risk than non-payers, have a higher share price than never payers and always payers are found to be more liquid than never payers.

Panel A: Before World War I			
	Always payer	Never Payer	Difference
Dividend yield	5.24	0.00	5.24***
			(0.11)
Size (in million BEF)	560.70	286.98	273.72**
			(135.45)
Age	15.50	5.29	10.20***
			(0.95)
Idiosyncratic risk	4.09	12.18	-8.09***
			(0.99)
Share denomination	67,835.89	20,793.86	47,042.03***
			(5,587.26)
Liquidity	8.21	6.00	2.21***
			(0.54)
Panel B: Interbellum			
	Always payer	Never Payer	Difference
Dividend yield	5.53	0.00	5.53***
			(0.20)
Size (in million BEF)	1,195.11	83.35	1,111.76***
			(243.56)
Age	37.01	21.86	15.15
Idiosyncratic risk	6.88	13.62	-6.73***
			(0.49)
Share denomination	27,251.36	2,541.04	24,71.32***
			(2,182.31)
Liquidity	11.09	8.75	2.33***
			(0.33)
Panel C: After World War II			
	Always payer	Never Payer	Difference
Dividend yield	4.58	0.00	4.58***
			(0.19)
Size (in million BEF)	54.89	34.77	20.12***
			(4.58)
Age	54.89	34.77	20.11***
			(4.58)
Idiosyncratic risk	5.25	12.30	-7.05***
			(0.81)
Share denomination	7,465.40	895.56	6,569.84***
			(979.93)
Liquidity	11.32	10.66	0.67**
			(0.35)

Appendix C: Additional results for Study III

This appendix contains the results of the additional analyses that are not reported in the paper. Additionally, the complete outputs of the results reported in different tables in Chapter III are also included in this Appendix. Section 1 includes the additional analyses and complete outputs on the role of the initial dividend policy; Section 2 contains the complete outputs for the robustness check on the impact of the initial dividend policy in different IPO-cohorts.

1. The role of initial dividend policy

1.1 The influence of initial dividend policy on future dividend policies

We investigate the impact of the initial dividend per share on future levels of dividend per share for all paying firms only. Results are reported in Appendix C − Table 1.

Appendix C − Table 1 The impact of initial dividend policy on future dividend policies We estimate following regression model: $\boldsymbol{Y_{it} = \alpha + \beta X_{i,t-1} + \gamma Y_{i1} + \mu_i + \nu_t + \varepsilon_{i,t}}$. $Y_{i,t}$ measures the the *Dividend per share*$_{i,t}$. This is the total nominal amount of dividends paid by firm *i* in year *t*. We regress the dividend per share on initial dividend per share (Y_{i1}), which is the initial value of the dividend measures and we control for size, age, idiosyncratic risk, share price and liquidity. We also include year-fixed effects and industry-fixed effects. Standard errors are clustered by firm and HAC-robust. Only firms paying a dividend are included.

	(1)	(2)	(3)	(4)	(5)
Initial dividend per share	0.209***	0.126***	0.107***	0.127***	0.109***
	(0.020)	(0.021)	(0.021)	(0.022)	(0.021)
Size		-0.052***	-0.029***	-0.060***	-0.033***
		(0.006)	(0.005)	(0.006)	(0.005)
Age		0.045***	0.057***	0.057***	0.052***
		(0.005)	(0.005)	(0.005)	(0.005)
Idiosyncratic risk		0.001	0.007	0.009*	0.009**
		(0.005)	(0.005)	(0.005)	(0.005)
Share price		0.332***	0.342***	0.345***	0.352***
		(0.008)	(0.008)	(0.009)	(0.008)
Liquidity		0.105***	0.015***	0.105***	0.019***
		(0.003)	(0.004)	(0.003)	(0.004)
Industry FE	No	No	No	Yes	Yes
Year FE	No	No	Yes	No	Yes
Observations	40,417	39,027	39,027	39,027	39,027
Adjusted R^2	0.0439	0.157	0.203	0.162	0.207

1.2 The influence of initial dividend policy on future dividend policies

In Table III − 3 and Table III − 4, we report the impact of the initial dividend policy on future dividend policy. Additionally, we include decade dummies and an interaction-term between this decade dummies and the initial dividend policy. For space considerations, we do not include the coefficient estimates of the firm characteristics in Table III − 3 and Table III − 4. Therefore, Appendix C − Table 2 (Appendix C − Table 3) report the complete output of the results reported in Table III − 3 (Table III − 4).

Appendix C − Table 2 How long does the initial decision to pay affect future decisions to pay We estimate following regression model: $Y_{it} = \alpha + \beta X_{it-1} + \gamma Y_{i1} + \delta_1 Decade_{it} + \delta_2 Y_{i1} \times Decade_{it} + \mu_t + \nu_t + \varepsilon_{i,t}$. $Y_{i,t}$ measures $Payer_{i,t}$. We regress the decision to pay on the initial decision to pay (Y_{i1}) and we control for size, age, idiosyncratic risk, share price and liquidity. We also include decade dummies and an interaction effect between decade and the initial dividend policy. Decade1 is equal to 1 for all observations between listing year 2 and listing year 10. Decade2 is equal to 1 for all observations between listing year 11 and listing year 20, and so on. Decade6 is equal to 1 for all observations as from listing year 50. We include year-fixed effects and industry-fixed effects. Standard errors are HAC robust and clustered by firm.

Panel A: Coefficient estimates

	(1)	(2)	(3)	(4)	(5)
Initial dividend policy	1.594***	0.956***	0.968***	0.956***	0.963***
	(0.040)	(0.051)	(0.054)	(0.051)	(0.054)
Decade 2	0.697***	0.555***	0.689***	0.509***	0.644***
	(0.048)	(0.061)	(0.066)	(0.061)	(0.067)
Decade 3	1.086***	0.738***	0.777***	0.670***	0.718***
	(0.052)	(0.066)	(0.075)	(0.067)	(0.076)
Decade 4	1.239***	0.865***	0.983***	0.788***	0.928***
	(0.058)	(0.073)	(0.085)	(0.074)	(0.086)
Decade 5	1.435***	0.843***	0.778***	0.792***	0.760***
	(0.066)	(0.084)	(0.097)	(0.085)	(0.098)
Decade 6	1.570***	0.751***	0.551***	0.655***	0.537***
	(0.053)	(0.071)	(0.087)	(0.073)	(0.090)
Initial decision to pay * Decade 2	-0.908***	-0.611***	-0.676***	-0.608***	-0.669***
	(0.058)	(0.073)	(0.077)	(0.074)	(0.078)
Initial decision to pay * Decade 3	-1.231***	-0.872***	-0.857***	-0.860***	-0.841***
	(0.063)	(0.078)	(0.084)	(0.079)	(0.084)
Initial decision to pay * Decade 4	-1.401***	-1.078***	-1.163***	-1.056***	-1.121***
	(0.070)	(0.085)	(0.092)	(0.086)	(0.092)
Initial decision to pay * Decade 5	-1.594***	-1.165***	-1.156***	-1.158***	-1.118***
	(0.079)	(0.097)	(0.102)	(0.097)	(0.103)
Initial decision to pay * Decade 6	-1.633***	-1.145***	-1.123***	-1.091***	-1.022***
	(0.063)	(0.078)	(0.081)	(0.079)	(0.083)
Size		1.224***	1.552***	1.006***	1.335***
		(0.051)	(0.056)	(0.053)	(0.058)
Age		-0.535***	-0.469***	-0.342***	-0.266***
		(0.052)	(0.066)	(0.056)	(0.068)
Idiosyncratic risk		-1.894***	-2.006***	-1.697***	-1.828***
		(0.046)	(0.049)	(0.047)	(0.051)
Share denomination		2.535***	2.824***	3.073***	3.369***
		(0.053)	(0.057)	(0.058)	(0.063)
Liquidity		0.182***	0.151***	0.191***	0.171***
		(0.004)	(0.005)	(0.004)	(0.006)
Observations	51,570	49,381	49,381	49,381	49,381
Log likelihood	-33513	-24210	-22203	-23741	-21657
pseudo R^2	0.0360	0.273	0.333	0.287	0.350

Panel B: Odds ratios					
	(1)	(2)	(3)	(4)	(5)
Initial dividend policy	4.924***	2.601***	2.633***	2.601***	2.619***
Decade 2	2.007***	1.742***	1.993***	1.663***	1.903***
Decade 3	2.962***	2.092***	2.175***	1.953***	2.051***
Decade 4	3.451***	2.375***	2.673***	2.198***	2.528***
Decade 5	4.201***	2.324***	2.176***	2.208***	2.138***
Decade 6	4.804***	2.120***	1.736***	1.925***	1.710***
Initial DP * Decade 2	0.403***	0.543***	0.509***	0.544***	0.512***
Initial DP * Decade 3	0.292***	0.418***	0.425***	0.423***	0.431***
Initial DP * Decade 4	0.246***	0.340***	0.313***	0.348***	0.326***
Initial DP * Decade 5	0.203***	0.312***	0.315***	0.314***	0.327***
Initial DP * Decade 6	0.195***	0.318***	0.325***	0.336***	0.360***
Size		3.401***	4.720***	2.735***	3.800***
Age		0.586***	0.625***	0.710***	0.766***
Idiosyncratic risk		0.150***	0.134***	0.183***	0.161***
Share denomination		12.617***	16.850***	21.613***	29.036***
Liquidity		1.199***	1.163***	1.211***	1.186***

Appendix C − Table 3 How long does the initial dividend per share affect the future dividend per share We estimate following regression model: $\boldsymbol{Y_{it} = \alpha + \beta X_{it-1} + \gamma Y_{i1} + \delta_1 Decade_{it} + \delta_2 Y_{i1} \times Decade_{it} + \mu_t + \nu_t + \varepsilon_{i,t}}$. $Y_{i,t}$ measures the *Dividend per share*$_{i,t}$. We regress the dividend per share on the initial dividend per share (Y_{i1}) and we control for size, age, idiosyncratic risk, share price and liquidity. We also include decade dummies and an interaction effect between decade and the initial dividend policy. Decade1 is equal to 1 for all observations between listing year 2 and listing year 10. Decade2 is equal to 1 for all observations between listing year 11 and listing year 20, and so on. Decade6 is equal to 1 for all observations as from listing year 50. We include year-fixed effects and industry-fixed effects. Standard errors are HAC robust and clustered by firm.

	(1)	(2)	(3)	(4)	(5)
Initial DPS	0.217***	0.112***	0.086***	0.111***	0.086***
	(0.019)	(0.021)	(0.021)	(0.021)	(0.021)
Decade 2	0.028***	0.028***	-0.003	0.024***	-0.006
	(0.008)	(0.008)	(0.010)	(0.009)	(0.010)
Decade 3	0.104***	0.076***	-0.025**	0.070***	-0.028**
	(0.008)	(0.008)	(0.011)	(0.008)	(0.011)
Decade 4	0.174***	0.145***	0.001	0.138***	-0.002
	(0.012)	(0.011)	(0.016)	(0.012)	(0.016)
Decade 5	0.263***	0.205***	0.015	0.201***	0.014
	(0.015)	(0.014)	(0.020)	(0.014)	(0.020)
Decade 6	0.593***	0.468***	0.157***	0.458***	0.155***
	(0.019)	(0.017)	(0.023)	(0.017)	(0.024)
Initial DPS * Decade 2	0.054	0.079	0.085	0.081	0.086
	(0.067)	(0.069)	(0.068)	(0.068)	(0.068)
Initial DPS * Decade 3	-0.070**	-0.041	-0.044	-0.037	-0.041
	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)
Initial DPS * Decade 4	-0.134***	-0.083***	-0.087***	-0.076***	-0.082***
	(0.022)	(0.023)	(0.023)	(0.022)	(0.023)
Initial DPS * Decade 5	-0.182***	-0.111***	-0.104***	-0.105***	-0.099***
	(0.025)	(0.025)	(0.025)	(0.025)	(0.026)
Initial DPS * Decade 6	-0.020	0.046	0.066*	0.050	0.067**
	(0.034)	(0.033)	(0.034)	(0.033)	(0.034)
Size		-0.043***	-0.025***	-0.049***	-0.031***
		(0.005)	(0.005)	(0.006)	(0.005)
Age		-0.053***	0.016**	-0.045***	0.014**
		(0.005)	(0.006)	(0.005)	(0.007)
Idiosyncratic risk		0.012***	0.020***	0.019***	0.024***
		(0.004)	(0.005)	(0.004)	(0.004)
Share denomination		0.340***	0.347***	0.354***	0.361***
		(0.008)	(0.009)	(0.009)	(0.009)
Liquidity		0.063***	0.017***	0.065***	0.021***
		(0.003)	(0.004)	(0.003)	(0.004)
Industry FE	No	No	No	Yes	Yes
Year FE	No	No	Yes	No	Yes
Observations	51,570	49,381	49,381	49,381	49,381
Adjusted R^2	0.0874	0.175	0.195	0.179	0.179

Appendix C − Table 4 The impact of initial dividend policy measured at year *t* (*t* = 10, 15, 20, …,50) on future dividend policies We estimate following regression model: $\boldsymbol{Y_{it} = \alpha + \beta X_{it-1} + \gamma Y_{i1} + \mu_i + \nu_t + \varepsilon_{i,t}}$. $Y_{i,t}$ measures the decision to pay ($Payer_{i,t}$), which is a dummy-variable equal to one if a firm pays a dividend in year *t* and zero otherwise. We regress the dividend measures on initial dividend policy (Y_{i1}), which is the initial value of the dividend measures at year *t* (*t* = 10, 15, 20, …, 50) and we control for size, age, idiosyncratic risk, share price (not for dividend yield) and liquidity. We also include time-fixed effects and industry-fixed effects. Standard errors are clustered by firm and HAC-robust.

Panel A: Coefficient estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$Payer_{10}$	0.494***								
	(0.029)								
$Payer_{15}$		0.293***							
		(0.032)							
$Payer_{20}$			0.352***						
			(0.037)						
$Payer_{25}$				0.356***					
				(0.039)					
$Payer_{30}$					0.466***				
					(0.045)				
$Payer_{35}$						0.289***			
						(0.046)			
$Payer_{40}$							0.445***		
							(0.052)		
$Payer_{45}$								0.404***	
								(0.059)	
$Payer_{50}$									0.439***
									(0.066)
Size	1.422***	1.524***	1.557***	1.728***	1.786***	1.820***	1.803***	1.894***	1.768***
	(0.065)	(0.071)	(0.078)	(0.084)	(0.091)	(0.099)	(0.108)	(0.120)	(0.133)
Age	-0.830***	-0.969***	-0.970***	-0.857***	-1.011***	-0.895***	-0.900***	-0.871***	-0.968***
	(0.061)	(0.070)	(0.080)	(0.091)	(0.104)	(0.119)	(0.136)	(0.159)	(0.189)
Idiosyncratic	-1.807***	-1.744***	-1.770***	-1.808***	-1.679***	-1.638***	-1.401***	-1.305***	-1.210***
risk	(0.058)	(0.063)	(0.068)	(0.075)	(0.081)	(0.088)	(0.098)	(0.108)	(0.123)
Share	3.146***	3.131***	3.158***	2.995***	2.919***	2.968***	2.918***	2.985***	2.867***
denomination	(0.070)	(0.075)	(0.080)	(0.086)	(0.093)	(0.100)	(0.108)	(0.118)	(0.129)
Liquidity	0.169***	0.1063***	0.157***	0.159***	0.151***	0.158***	0.143***	0.117***	0.117***
	(0.007)	(0.008)	(0.009)	(0.010)	(0.011)	(0.012)	(0.013)	(0.015)	(0.018)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	38,158	32,535	27,684	23,328	19,572	16,332	13,514	11,139	9,096
Adjusted R2	0.211	0.205	0.212	0.208	0.213	0.276	0.276	0.282	0.268

Panel B: Odds ratios									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$Payer_{10}$	1.638***								
$Payer_{15}$		1.340***							
$Payer_{20}$			1.421***						
$Payer_{25}$				1.428***					
$Payer_{30}$					1.593***				
$Payer_{35}$						1.335***			
$Payer_{40}$							1.560***		
$Payer_{45}$								1.498***	
$Payer_{50}$									1.551***
Size	4.147***	4.588***	4.745***	5.628***	5.965***	6.169***	6.070***	6.649***	5.861***
Age	0.436***	0.379***	0.379***	0.424***	0.364***	0.409***	0.407***	0.418***	0.380***
Idiosyn. risk	0.164***	0.175***	0.170***	0.164***	0.187***	0.194***	0.246***	0.271***	0.298***
Share denom.	23.232***	22.895***	23.529***	19.985***	18.531***	19.446***	18.498***	19.789***	17.589***
Liquidity	1.184***	1.177***	1.169***	1.172***	1.163***	1.171***	1.154***	1.124***	1.124***

Appendix C − Table 5 The impact of initial dividend policy measured at year *t* (*t* = 10, 15, 20, …,50) on future dividend policies We estimate following regression model: $\boldsymbol{Y_{it} = \alpha + \beta X_{it-1} + \gamma Y_{i1} + \mu_i + \nu_t + \varepsilon_{i,t}}$. $Y_{i,t}$ measures the *Dividend per share*$_{i,t}$, which is the total nominal amount of dividends paid by firm *i* in year *t*. We regress the dividend measures on initial dividend policy (Y_{i1}), which is the initial value of the dividend measures at year *t* (*t* = 10, 15, 20, …, 50) and we control for size, age, idiosyncratic risk, share price (not for dividend yield) and liquidity. We also include decade-fixed effects and industry-fixed effects. Standard errors are clustered by firm and HAC-robust. Note that the inclusion of year-fixed effects yields to non-symmetric variance matrix. Therefore, decade-fixed effects are included.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
DPS_{10}	0.153***								
	(0.036)								
DPS_{15}		0.051***							
		(0.018)							
DPS_{20}			0.090***						
			(0.013)						
DPS_{25}				0.058***					
				(0.012)					
DPS_{30}					0.085***				
					(0.013)				
DPS_{35}						0.275***			
						(0.031)			
DPS_{40}							0.272***		
							(0.031)		
DPS_{45}								0.275***	
								(0.027)	
DPS_{50}									0.247***
									(0.028)
Size	-0.036***	-0.036***	-0.041***	-0.031***	-0.041***	-0.059***	-0.057***	-0.066***	-0.053***
	(0.006)	(0.007)	(0.007)	(0.008)	(0.008)	(0.010)	(0.010)	(0.011)	(0.012)
Age	0.056***	0.060***	0.071***	0.078***	0.074***	0.071***	0.075***	0.079***	0.096***
	(0.004)	(0.005)	(0.006)	(0.006)	(0.007)	(0.008)	(0.009)	(0.010)	(0.012)
Idiosyncratic	0.016***	0.016***	0.009	0.013*	0.010	0.000	-0.010	-0.014	-0.016*
risk	(0.005)	(0.005)	(0.006)	(0.006)	(0.007)	(0.008)	(0.008)	(0.009)	(0.010)
Share	0.355***	0.410***	0.409***	0.416***	0.420***	0.382***	0.359***	0.380***	0.376***
denomination	(0.013)	(0.010)	(0.010)	(0.011)	(0.012)	(0.011)	(0.011)	(0.012)	(0.013)
Liquidity	0.025***	0.027***	0.027***	0.031***	0.033***	0.037***	0.046***	0.050***	0.053***
	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)	(0.006)	(0.007)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Decade FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	38,158	32,535	27,684	23,328	19,572	16,332	13,514	11,139	9,096
Adjusted R2	0.211	0.205	0.212	0.208	0.213	0.276	0.276	0.282	0.268

2. Robustness tests

2.1 Does the stable component exist in all time-periods?

Figure III − 2 of Chapter III investigates whether the initial dividend policy has an impact on future dividend policy in all periods of time. In order to do this, we estimate Equation III.I per first listing-cohort. We only include firms that go public in a specific decade (i.e. between year 1xx0 and 1xx9). We estimate our model for all first listing-cohorts between 1840 and 1930. As the numbers of firms entering the stock market before 1840 is limited, we include these firms in the 1840 listing-cohort. We only take into account the observations of the first twenty listing years. However, for space considerations, we only reported the odds ratio (standardized coefficient estimate) for the initial dividend policy. Appendix C − Table 6 displays the entire output corresponding to Figure III − 2, Panel A ($Payer_{i,t}$); Appendix C − Table 7 reports the entire output corresponding to Figure III − 2, Panel B ($Dividend\ per\ share_{i,t}$).

Appendix C − Table 6 The impact of initial dividend policy on future dividend policy per IPO cohort For $Payer_{i,t}$, we estimate per decade the impact of the initial decision to pay on future decisions to pay, controlling for size, age, idiosyncratic risk, share denomination and liquidity. Year-fixed effects and industry-fixed effects are included. We do this for all firms that go public in a given decade and we only include the first twenty observations per firm. Standard errors are clustered at firm level and are HAC robust.

	1840	1850	1860	1870	1880	1890	1900	1910	1920	1930
Panel A: Coefficient estimates										
Initial decision to pay	1.701***	1.664***	1.077***	0.693*	0.231	0.829***	0.358***	0.390***	0.477***	0.010
	(0.307)	(0.344)	(0.307)	(0.408)	(0.201)	(0.117)	(0.093)	(0.116)	(0.082)	(0.191)
Size	2.724***	0.977	0.114	2.793***	0.693	0.912***	1.513***	0.947***	0.890***	0.933**
	(0.703)	(0.760)	(0.685)	(0.760)	(0.452)	(0.308)	(0.226)	(0.242)	(0.188)	(0.395)
Age	-2.2999*	2.699***	3.295***	-1.746*	-0.447	0.042	0.937***	0.562	0.057	0.998**
	(0.636)	(0.813)	(1.245)	(0.901)	(0.565)	(0.334)	(0.236)	(0.351)	(0.182)	(0.419)
Idiosyncratic risk	-0.079	-0.688	-0.780	-1.808***	-1.670***	-3.823***	-2.522***	-1.761***	-1.392***	-2.106***
	(0.532)	(0.545)	(0.571)	(0.528)	(0.738)	(0.276)	(0.193)	(0.214)	(0.146)	(0.327)
Share denomination	2.500***	2.455***	6.115***	6.458***	6.137***	2.609***	3.069***	3.247***	4.340***	2.216***
	(0.632)	(0.723)	(0.817)	(0.684)	(0.562)	(0.310)	(0.245)	(0.268)	(0.215)	(0.409)
Liquidity	0.360***	0.155***	0.170***	-0.041	0.175***	0.195***	0.196***	0.258***	0.226***	0.184***
	(0.056)	(0.036)	(0.041)	(0.039)	(0.030)	(0.021)	(0.016)	(0.023)	(0.017)	(0.045)
Year-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	613	627	538	591	1,401	2,752	4,071	2,642	5,088	1,262
Log likelihood	-202.4	-223.8	-223.5	-269.4	-472.4	-1,140	-1,759	-1,155	-2,392	-568.7
Pseudo R^2	0.498	0.310	0.392	0.517	0.396	0.399	0.372	0.361	0.318	0.310
Panel B: Odds ratios										
Initial decision to pay	5.482***	5.279***	2.937***	2.000*	1.260	2.290***	1.430***	1.477***	1.611***	1.010
Size	15.234***	2.656	1.120	16.331***	1.999	2.490***	4.540***	2.577***	2.436***	2.542**
Age	0.100***	14.861***	26.938***	0.174**	0.640	1.043	2.553***	1.754	1.059	2.714**
Idiosyncratic risk	0.924	0.503	0.458	0.164***	0.188***	0.022***	0.080***	0.172***	0.249***	0.122***
Share denomination	12.148***	11.646***	452.433***	637.704***	462.885***	13.589***	21.518***	25.722***	76.728***	9.168***
Liquidity	1.433***	1.168***	1.186***	0.960	1.192***	1.215***	1.216***	1.295***	1.254***	1.202***

Appendix C − Table 7 The impact of initial dividend policy on future dividend policy per IPO cohort For *Dividend per share*$_{i,t}$, we estimate per decade the impact of the initial dividend per share on future dividends per share, controlling for size, age, idiosyncratic risk, share denomination and liquidity. Year-fixed effects and industry-fixed effects are included. We do this for all firms that go public in a given decade and we only include the first twenty observations per firm. Standard errors are clustered at firm level and are HAC robust.

	1840	1850	1860	1870	1880	1890	1900	1910	1920	1930
Initial dividend per	0.046	0.078	0.139**	0.246***	0.047	0.204***	0.058*	0.083	0.048	0.328***
share	(0.040)	(0.053)	(0.057)	(0.051)	(0.033)	(0.067)	(0.034)	(0.000)	(0.034)	(0.079)
Size	0.128**	0.062	-0.042	0.189***	-0.097***	0.025	0.015	0.052	-0.030**	0.019
	(0.053)	(0.083)	(0.054)	(0.062)	(0.028)	(0.039)	(0.018)	(0.00)	(0.015)	(0.024)
Age	0.077*	0.099***	0.127*	0.248***	0.082**	0.054*	0.012	0.054	0.006	0.075**
	(0.044)	(0.034)	(0.067)	(0.054)	(0.038)	(0.031)	(0.014)	(0.000)	(0.014)	(0.031)
Idiosyncratic risk	0.003	0.172***	0.141***	0.049	-0.076**	0.060**	0.066***	-0.010	0.059***	0.073**
	(0.037)	(0.064)	(0.047)	(0.042)	(0.039)	(0.028)	(0.020)	(0.000)	(0.016)	(0.029)
Share denomination	0.267***	0.062*	0.005	-0.024	0.186***	0.027	0.087***	0.101	0.083***	-0.009
	(0.044)	(0.033)	(0.033)	(0.039)	(0.033)	(0.047)	(0.019)	(0.000)	(0.012)	(0.024)
Liquidity	0.292***	0.483**	0.629***	0.352***	0.562***	0.531***	0.494***	0.358	0.541***	0.327***
	(0.053)	(0.055)	(0.057)	(0.035)	(0.037)	(0.036)	(0.035)	(0.000)	(0.028)	(0.034)
Year-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	584	602	517	854	1,340	2,635	3,891	2,531	4,885	1,207
Adjusted R^2	0.552	0.418	0.481	0.518	0.380	0.382	0.353	0.241	0.352	0.471

Nederlandstalige Samenvatting

1. Waarom is economische geschiedenis belangrijk?

In dit doctoraatsonderzoek bestudeer ik de dividendpolitiek van Belgische en koloniale ondernemingen in de periode 1824−2012. De economische geschiedenis bestuderen is belangrijk voor ten minste twee redenen. Ten eerste zorgt terugkijken naar de geschiedenis ervoor dat we weten hoe het vroeger was. Dit is noodzakelijk om ten volle te begrijpen waar we vandaag staan (Blum en Colvin, 2018). Ten tweede, als we kijken naar dividendpolitiek, dan is het belangrijk om ook de omgeving waarin ondernemingen actief zijn goed te begrijpen. De institutionele omgeving heeft namelijk een belangrijke invloed op de dividendpolitiek van ondernemingen (bv. La Porta et al., 2000). In de beschouwde periode, verandert de institutionele omgeving heel sterk. Bijgevolg kan het bestuderen van dividendpolitiek op de lange termijn zorgen voor belangrijke nieuwe inzichten in de relatie tussen de dividendpolitiek en de omgeving waarin ondernemingen actief zijn.

Een eerste belangrijke vraag is dus: Waar komen dividenden vandaan? Het antwoord op deze vraag vinden we in de vroege 17e eeuw, de eeuw waarin de eerste maatschappijen op aandelen ontstonden. De meest bekende maatschappijen uit dat tijdperk zijn de Nederlandse Oost-Indische Compagnie en de Engelse Oost-Indische Compagnie, twee ondernemingen die belangrijk waren voor de internationale handel. De financiering van deze ondernemingen was gekenmerkt door een korte termijn focus. Er werden verschillende reizen georganiseerd naar het oosten en voor elke reis, werd afzonderlijk kapitaal opgehaald. Als de reis voltooid was, werden de opbrengsten van de reis uitbetaald aan aandeelhouders en werd de reis ontbonden. Deze *"verdelingen"* (*"divisions"*) zijn in feite de eerste dividenden die ooit werden uitbetaald. Op dat moment werd er geen onderscheid gemaakt tussen dividenden en kapitaalwinst: beide waren het resultaat van het ontbinden van de reis. De eerste dividenden werden dus letterlijk uitbetaald als de restwaarde van de onderneming. Naarmate de Engelse en Nederlandse Oost-Indische Compagnie zich verder ontwikkelden, maakte de financiering per reis plaats voor een meer permanente kapitaalstructuur. De Nederlandse Oost-Indische Compagnie maakte deze transformatie in 1612; de Engelse Oost-Indische Compagnie bleef de financiering per reis gebruiken tot 1659 (Neal, 1990). Dankzij de overgang naar een meer lange-termijn oriëntatie, was het niet langer nodig dat de *volledige onderneming* ontbonden werd om de *verdelingen* te betalen; vanaf dan werden de *verdelingen* enkel betaald uit de netto-inkomsten (Baskin en Miranti, 1997). Vandaag hebben ondernemingen nog altijd deze lange-termijn oriëntatie. Een belangrijke vraag is dan ook waarom ondernemingen in de 21e eeuw nog steeds een dividend uitbetalen. Dit is een groot vraagstuk in de literatuur omtrent bedrijfsfinanciering. Een lange termijn onderzoek naar dividendpolitiek kan bijdragen tot het oplossen van dit mysterie.

De institutionele omgeving waarin ondernemingen actief zijn, heeft een grote invloed op de dividendpolitiek van ondernemingen (bv. La Porta et al., 2000). Aangezien de institutionele omgeving typisch zeer traag verandert, is een lange termijn perspectief noodzakelijk om deze relatie te bestuderen. Tijdens onze onderzoeksperiode, verandert de institutionele omgeving zeer drastisch. Aan de start van onze onderzoeksperiode is de bescherming van beleggers erg zwak. De vennootschapswetgeving, zoals ingevoerd door Napoleon in 1807, was nog steeds van kracht. Voor de oprichting van een naamloze vennootschap (NV) was overheidstoestemming nodig. Eens de NV opgericht was, golden er zeer weinig regels. Ondernemingen moesten bijvoorbeeld geen jaarrekening publiceren, de jaarlijkse algemene vergadering was enkel toegankelijk voor grote aandeelhouders en er was geen raad van bestuur (Demeur, 1859; Théate, 1905). Bovendien waren dividenden niet belast. In deze omgeving zijn dividenden een zeer belangrijke bron van informatie voor beleggers (Baskin en Miranti, 1997). Doorheen onze onderzoeksperiode verandert de institutionele omgeving zeer sterk. Ik geef enkele voorbeelden om dit te illustreren: de oprichtingsvereisten veranderden sterk (1873) (Théate, 1905), de wetgeving m.b.t. de toegang tot en het stemrecht op de algemene vergadering werden aangepast (1873, 1934) (Willems, 2000), de wetgeving m.b.t. publicatie-vereisten werd een aantal keer verbeterd (1873, 1913, 1953, 1975) (’t Kint, 1985; Centre d’étude des Sociétés, 1956; Théate, 1905; Wauwermans, 1914), wetten op handel met voorkennis en overnames werden ingevoerd (1989) (Geens, 1990; Hendrickx and Van gulck, 1991) en er werd een code voor deugdelijk bestuur ontwikkeld (2004) (Commissie Corporate Governance, 2004). Naast deze grondige wijzigingen in de vennootschapswetgeving, veranderde het belastingsysteem in België ook drastisch, met grote aanpassingen in het systeem in 1920 (Gilson, 1921) en 1962 (Henry, 1967). Gegeven dat dividendpolitiek beïnvloed wordt door de omgeving waarin ondernemingen actief zijn, kan een lange-termijn onderzoek zorgen voor een beter begrip van dividendpolitiek.

België is ook een uitstekende omgeving om zulk een lange termijn onderzoek uit te voeren. Hiervoor zijn verschillende redenen. Ten eerste, België is het enige land in de wereld waarvoor er gedetailleerde dividenddata beschikbaar is over de tijdsperiode die in dit onderzoek beschouwd wordt. Aangezien er verscheidene bronnen werden geconsulteerd en de data handmatig verzameld werden, is deze zeer betrouwbaar en van hoge kwaliteit (Annaert et al., 2012). Ten tweede, in de periode voor Wereldoorlog I was België economisch een toonaangevend land. Het was het eerste land op het Europese vasteland dat industrialiseerde en de Beurs van Brussel behoorde tot de grootste en meest actieve aandelenmarkten ter wereld. Daarnaast bestaat onze onderzoeksperiode uit een periode met en een periode zonder dividendbelasting, wat voor een beter begrip zorgt van de relatie tussen belastingen en dividendpolitiek.

In de volgende drie paragrafen bespreek ik de resultaten van de drie empirische studies.

2. Studie I: Beleggersbescherming, belasting en dividendpolitiek: Lange-termijn onderzoek, 1838−2012

In het eerste empirische onderzoek, behandelen we de vraag hoe veranderingen in de institutionele omgeving de dividendpolitiek beïnvloeden. Hiertoe gebruiken we 175 jaar aan gegevens van Belgische en koloniale ondernemingen met een notering op de Beurs van Brussel.

Er wordt algemeen aangenomen dat dividendpolitiek in belangrijke mate beïnvloed wordt door de omgeving waarin ondernemingen opereren (bv. La Porta et al., 2000). De vennootschapswetgeving beïnvloedt het niveau van beleggersbescherming, wat op zijn beurt een invloed heeft op de grootte en het belang van problemen van asymmetrische informatie en de kosten ten gevolge van belangenconflicten tussen managers en aandeelhouders. Dit zijn twee belangrijke determinanten van dividendpolitiek (bv. DeAngelo et al., 2006; Floyd et al., 2015; Hail et al., 2014; La Porta et al., 2000; Lang en Litzenberger, 1989; Nissim en Ziv, 2001). Bovendien beïnvloedt de belastingwetgeving het verschil tussen de belasting op kapitaalwinst en de belasting op dividenden. Hoe zwaarder dividenden belast worden relatief t.o.v. kapitaalwinsten, des te onaantrekkelijker ze worden vanuit een belastingoogpunt (de zogenaamde *dividendbelastingstraf*) (bv. Brennan, 1970). Aangezien de beleggersbescherming sterk toeneemt doorheen de tijd en de verandering in de belastingwetgeving ervoor zorgt dat dividenden vanuit een belasting perspectief steeds minder aantrekkelijk worden, verwachten we dat dividenden minder belangrijk worden doorheen de tijd.

We starten het onderzoek met het bestuderen van de evolutie van dividendpolitiek. Vervolgens voeren we een structurele breukanalyse uit. Dit laat ons toe om aan te tonen of er structurele veranderingen in de dividendpolitiek van Belgische ondernemingen zijn. We schatten ook tijdsreeksregressies en cross-sectionele regressies om de impact van verschillende wetsveranderingen op dividendpolitiek te kunnen meten.

Verrassend genoeg vinden we dat dividendpolitiek zeer stabiel is gedurende de beschouwde periode. De structurele breukanalyse wijst op drie breuken in dividendpolitiek van Belgische ondernemingen. De eerste twee breuken bevinden zich aan de start van Wereldoorlog I en aan het einde van Wereldoorlog II. De derde breuk vindt plaats halverwege de jaren 1980. Als we de structurele breuk analyse herhalen en de oorlogsjaren buiten beschouwing laten (1914−1918 voor Wereldoorlog I en 1940−1945 voor Wereldoorlog II), dan vinden we geen breuken rond de start van Wereldoorlog I en het einde van Wereldoorlog II. Dit toont aan dat de eerste twee breuken volledig te wijten zijn aan het effect van de wereldoorlogen. De derde breuk in dividendpolitiek, de breuk in het midden van de jaren 1980, wordt veroorzaakt door de

veranderingen in het type van ondernemingen dat naar de beurs trekt. Ook de tijdsreeksanalyses en cross-sectionele analyses wijzen erop dat veranderingen in de vennootschapswetgeving en de belastingwetgeving geen invloed hebben op de dividendpolitiek.

De vraag blijft natuurlijk: Waarom zijn dividenden zo stabiel over zulk een lange tijdsperiode? We geven drie potentiële verklaringen. Ten eerste, in de 19e eeuw en aan het begin van de 20e eeuw, zijn het aantal beleggers beperkt. Voornamelijk welvarende families zijn in staat om in aandelen te beleggen. Daardoor kan sociale controle een belangrijk mechanisme zijn dat ervoor zorgt dat aandeelhouders niet benadeeld worden. Ten tweede, net zoals voor Groot-Brittannië (Acheson et al., 2016), vinden we dat ondernemingen vrijwillig beschermingsmechanismen opnemen in hun statuten. Zodoende is de feitelijke bescherming van beleggers vaak beter dan wettelijk vereist, wat ervoor kan zorgen dat het belang van dividenden in de vooroorlogse periode kleiner is. Een derde mogelijk verklaring is dat de perceptie van wat goede bescherming van beleggers is, ook verandert doorheen de tijd. Als we beleggersbescherming vergelijken tussen België en bijvoorbeeld Groot-Brittannië, dan vinden we dat Belgische beleggers zowel in historische kapitaalmarkten als in hedendaagse kapitaalmarkten slechter beschermd zijn dan Britse beleggers. Belgische beleggers kunnen zichzelf dus nog altijd als slecht beschermd beschouwen en daardoor zou het kunnen dat de dividendbetaling zowel in de vooroorlogse als in de naoorlogse periode belangrijk is.

3. Studie II: Waarom betalen ondernemingen een dividend? Bewijs van 175 jaar dividendgeschiedenis

In het tweede empirisch onderzoek bestuderen we de determinanten van dividendpolitiek in België, over een periode van 175 jaar. Het lange termijnperspectief biedt ons de mogelijkheid om te onderzoeken of de redenen waarom bedrijven een dividend uitkeren afhankelijk zijn van (1) de institutionele omgeving, (2) de economische omgeving en (3) de maturiteit van de industrie waarin de onderneming actief is. Het is niet ondenkbaar dat ondernemingen een dividend uitkeren om verschillende redenen in verschillende situaties. Bijvoorbeeld, in het begin van onze onderzoeksperiode, was er nauwelijks financiële informatie beschikbaar voor aandeelhouders. Bijgevolg vormde het dividend vaak de enige vorm van informatie die beleggers op dat moment hadden. In dit geval is de signaalfunctie van dividenden zeer belangrijk (Baskin en Miranti, 1997). Vandaag hebben beleggers toegang tot veel betrouwbare financiële informatie over de onderneming en zodoende is de signaalfunctie van dividenden minder belangrijk geworden. Een zelfde redenering kan gemaakt worden voor verschillende economische situaties. In tijden van economische crisis is de signaalkost van dividenden groter, waardoor de waarde van het signaal ook belangrijker wordt. Zodoende zullen bedrijven meer geneigd zijn een dividend te betalen om een signaal te geven over de toekomst. Ook de maturiteit van de industrie kan een belangrijke invloed hebben op de reden waarom

bedrijven dividenden betalen. In jonge industrieën zijn problemen van asymmetrische informatie groot en zijn er veel investeringsopportuniteiten. In mature industrieën drogen investerings-opportuniteiten typisch op, worden ondernemingen winstgevender en is er minder asymmetrische informatie. Zodoende kunnen ondernemingen in jonge industrieën meer geneigd zijn een dividend te betalen omwille van de signaalfunctie, terwijl ondernemingen in mature industrieën dividenden betalen uit levenscyclus-overwegingen.

We vinden bewijs dat de determinanten van dividenden dezelfde zijn in verschillende institutionele omgevingen, tijdens economische recessie en economische expansie en tijdens alle fases van de industrie-levenscyclus. Grote ondernemingen, ondernemingen met minder bedrijfsspecifiek risico, ondernemingen met een hoge aandelenprijs en liquide ondernemingen zijn meer geneigd om een dividend te betalen. Bovendien wordt de meerderheid van dividenden betaald door een minderheid van grote ondernemingen.

Onze resultaten geven aan dat bedrijven geen dividend betalen om een signaal te geven naar beleggers. Als dit wel het geval zou zijn, dan zouden ondernemingen met meer bedrijfsspecifiek risico meer geneigd moeten zijn om een dividend te betalen. Het feit dat dividenden geconcentreerd zijn in de handen van grote bedrijven is ook moeilijk te rijmen met de signaalfunctie van dividenden. Als bedrijven een dividend echt zouden gebruiken als signaal, dan zouden de grote ondernemingen, die typisch bij een wijd publiek gekend zijn, niet de meerderheid van dividenden betalen. Levenscyclus argumenten blijken wel een belangrijke reden te zijn om dividend te betalen.

4. Studie III: Persistentie in dividendpolitiek: Lange termijn bewijs

In de derde empirische studie vertrekken we van een vaststelling uit de literatuur omtrent kapitaalstructuur. Recent bewijs toont aan dat de kapitaalstructuur van ondernemingen sterk wordt beïnvloed door een eerder niet-geobserveerde component, die zeer stabiel is doorheen het leven van de onderneming (bv. Hanousek en Shamshur, 2011; Hanssens et al., 2016; Lemmon et al., 2008). Voor dividendpolitiek is er veel bewijs dat dit op korte termijn ook zo is (bv. Brav et al., 2005; Lintner, 1956). In deze paper onderzoeken we of dit ook geldt voor dividendpolitiek. Gegeven dat de kapitaalstructuur van de onderneming en de dividendpolitiek onlosmakelijk met elkaar verbonden zijn, en gegeven de korte-termijn persistentie in dividenden, is het logisch om te onderzoeken of dividenden ook op lange termijn gedreven worden door een stabiele component. Dit wordt onderzocht in het derde hoofdstuk op basis van gegevens van ondernemingen die genoteerd zijn op de Beurs van Brussel tussen 1824 en 2012.

Vanuit theoretisch oogpunt is het niet duidelijk in welke mate dividenden beïnvloed zouden worden door een stabiele component. Aan de ene kant kan geargumenteerd worden dat de dividendpolitiek verandert in functie van de maturiteitsfase waarin een onderneming zich bevindt (bv. DeAngelo et al., 2006; Grullon et al., 2002). Jonge, kleine ondernemingen met veel groei-opportuniteiten zijn minder geneigd een dividend te betalen. Meer mature ondernemingen, met minder groei-opportuniteiten en een hogere winstgevendheid, zullen meer geneigd zijn om een dividend te betalen. Dit suggereert dat dividendpolitiek in latere fases van het leven van de onderneming niet beïnvloed wordt door dividendpolitiek op het moment van de onderneming haar eerste notering. Aan de andere kant zijn dividenden conservatief. Managers kijken naar de dividendbeslissing in het voorbije jaar wanneer ze hun huidige dividendbeslissing maken (bv. Brav et al., 2005; Lintner, 1956). Het feit dat dividenden conservatief zijn, impliceert dat de initiële dividendpolitiek wel een blijvende invloed heeft op toekomstige dividendpolitiek. Dit stemt overeen met de *imprinting* theorie (Marquis en Tilcsik, 2013; Stinchcombe, 1965). De *imprinting* theorie suggereert dat de onderneming tijdens bepaalde perioden in haar leven vatbaar is voor kenmerken in de omgeving, en deze kenmerken zullen een blijvende invloed hebben op de onderneming.

We tonen aan dat de initiële dividendpolitiek een blijvende invloed heeft op de toekomstige dividendpolitiek van ondernemingen. Gelijktijdig speelt ook het levenscyclus argument en neemt de invloed van de initiële dividendpolitiek af als de onderneming meer matuur wordt. Het feit dat dividenden een zeer persistente component hebben, is een zeer belangrijke vaststelling. Bovendien is dit nooit eerder vastgesteld in voorgaand wetenschappelijk onderzoek. Samengevat vinden we bewijs voor imprinting theorie en levenscyclusargumenten.

5. Conclusie

Dit doctoraatsonderzoek focust op dividendpolitiek van ondernemingen genoteerd op de Beurs van Brussel in de periode 1824−2012. Ten eerste wordt er onderzocht hoe de institutionele omgeving een invloed heeft op dividendpolitiek (Studie I). Vervolgens wordt er bekeken of de determinanten van dividendpolitiek verschillend zijn in verschillende omstandigheden (Studie II). Ten slotte wordt bekeken of de initiële dividendpolitiek een blijvende invloed heeft (Studie III). Stabiliteit blijkt de gemeenschappelijke deler van de drie studies te zijn. We tonen aan dat dividendpolitiek zeer stabiel is doorheen de tijd (Studie I), dat de determinanten van dividendpolitiek stabiel zijn in onze onderzoeksperiode (Studie II) en dat dividenden beïnvloed worden door een zeer stabiele component die een blijvende impact heeft doorheen het leven van de onderneming (Studie III).

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