

This item is the archived peer-reviewed author-version of:

Investor protection, taxation and dividend policy : long-run evidence, 1838-2012

Reference:

Moortgat Leentje, Annaert Jan, Deloof Marc.- Investor protection, taxation and dividend policy : long-run evidence, 1838-2012
Journal of banking and finance - ISSN 0378-4266 - 85(2017), p. 113-131
Full text (Publisher's DOI): <https://doi.org/10.1016/J.JBANKFIN.2017.08.013>
To cite this reference: <https://hdl.handle.net/10067/1454650151162165141>

Investor protection, taxation and dividend policy: Long-run evidence, 1838–2012*

Leentje Moortgat[†],^a Jan Annaert^b and Marc Deloof^b

^a University of Antwerp

^b University of Antwerp and Antwerp Management School

Abstract. We investigate whether investor protection and taxation legislation affect dividend policy, using a unique sample of all Belgian 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.

JEL CODE: G35, N23, N24

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

* We thank Frans Buelens, Chris Colvin, Abe De Jong, Yan Du, Ana Gomez-Loscos, Thomas Lambert, Zicheng Lei, John Turner, Christiaan Van Bochove, Gertjan Verdickt and Glen Vermeulen for helpful comments and suggestions. The paper has also benefited from presentations at the annual Congress of the European Business History Association (Utrecht), the Doctoral Day (Antwerp), the INFINITI Conference on International Finance (Ljubljana), the European Financial Management Association Annual Meeting (Amsterdam), the Finance and History Workshop (Amsterdam), the European Historical Economics Society Conference (Pisa), the Corporate Finance Day (Ghent), the Economic History Society Annual Conference (Cambridge), the European Social Science History Conference (Valencia) and the Conference on Legal Institutions and Finance (Edinburgh). We also thank the editor and two anonymous referees for their helpful comments. Leentje Moortgat received a PhD fellowship from the Flemish Research Foundation (FWO).

[†] Corresponding author: Leentje Moortgat, Prinsstraat 13, 2000 Antwerp, Belgium; leentje.moortgat@uantwerpen.be; 0032 3 265 40 96

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 policy¹ (e.g. DeAngelo et al., 2006; Floyd et al., 2014; Hail et al., 2014; La Porta et al., 2000; Lang and Litzenger, 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 substitution 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 policies in different ways. Firms change dividend policy in

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

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 shows 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 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 the evolution of dividend policy in Britain controlling for changes in investor protection and taxation and report no link between dividend policy and the legal environment. However, their time period covers only the post-World War II period (1949-2002). In this paper, we investigate 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 firms with listed common stocks in this period. 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 mitigate 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. 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 modifications in taxation or corporate legislation.

Our contributions to the literature are threefold. First of all, 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; Campbell 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). Second, our sample period consists of a period with and without dividend taxation, which further enhances our understanding of the impact of taxation on dividend policy. Third, in contrast to other research on dividend policy, our results suggest that changes in investor protection and taxation have little effect on dividend policy. This results are in line with Bank et al. (2009) who find no link between dividend policy and investor protection and taxation in the UK after World War II. 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 focuses 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, not only by present-day standards but also by contemporaneous standards. 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 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

² Daily average income of a male adult (older than 16) worker was less than 5 BEF in the 1840s (Neiryneck, 1944).

as to when a balance sheet was to be considered fraudulent (Guillery, 1886; Théate, 1905). 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 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. Until 1985, dividends were additionally taxed as part of the personal income of natural persons. In 2012,

this indirect dividend taxation was reintroduced for one year. Table I shows an overview of the evolution of the dividend taxation system in Belgium.

*** Insert Table I here ***

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 (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 SCOB database 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 firms listed on the spot market are considered. Figure 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 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.

*** Insert Figure 1 here ***

Additionally, we collect data on inflation and the short-term interest rate from different sources (an overview of our different data sources can be found in Appendix A Table A. I). 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:

$$Payers_t = New Payers_t + Old Payers_t + List Payers_t. \quad (1)$$

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:

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

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 for all stocks in year t is thus calculated as follows:

$$Propensity\ to\ pay_{all\ stocks,t} = \frac{Payers_t}{Total\ number\ of\ listed\ stocks_t}. \quad (3)$$

We calculate three variables to capture dividend payment dynamics:

$$Initiate_t = \frac{New\ Payers_t}{Nonpayers_{t-1} - Delist\ Nonpayers_t}, \quad (4)$$

$$Continue_t = \frac{Old\ Payers_t}{Payers_{t-1} - Delist\ Payers_t}, \quad (5)$$

$$Propensity\ to\ pay_{new\ stocks,t} = \frac{List\ Payers_t}{List\ Payers_t + List\ Nonpayers_t}. \quad (6)$$

$Initiate_t$ 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 yield³ 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 we investigate how the dividend policy of listed Belgian 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 BSE. During World War I and World War II, the BSE was temporarily closed⁴, but trading continued on informal markets. Moreover,

³ 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.

⁴ During World War I, the BSE was closed from July 27, 1914 to February 5, 1919. During World 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).

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 2. Descriptive statistics are included in the Appendix B.

*** Insert Figure 2 here ***

Panel A of Figure 2 describe the evolution of the *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 2 also includes the dividend tax rate throughout the period (right axis). The evolution of *Initiate*, 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%)⁵. Panel C describes the evolution of *Continue*, 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,

⁵ 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).

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*.⁶ This value is 3.97% over the entire period. The average dividend yield is again 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%).

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 U.S. 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 U.S. (10.03%), but the continuation

⁶ In unreported analyses (available from the corresponding author), we use the equally weighted dividend yield instead of the value-weighted dividend yield, but the results are very similar.

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 U.S. 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. The structural break analysis estimates a multiple linear regression model with M breaks of the form $y_t = x_t' \beta_j + u_t$. β_j is the coefficient estimate in each of the $M + 1$ subperiods, x_t is a $(q \times 1)$ vector of covariates, including a constant, $q = 1$ (there is one independent variable with structural breaks). As in Bai & Perron (2003), we allow up to five breaks ($M = 5$) and use a trimming $\varepsilon = 0.15$. Consequently, each period includes at least 26 observations ($h = 26$; $\varepsilon \times T = 0.15 \times 175$). A structural break is found whenever the average level of the 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, four different sets of tests⁷ are conducted to determine whether structural breaks are present in the data. If these tests reject the null hypothesis, structural breaks are present and a second set of tests is necessary to find the number of breaks and their location. There are three different

⁷ The tests conducted to test for the presence of structural breaks are the SupF-test of zero breaks versus m breaks ($m = 1, \dots, 5$), the SupF-tests of $l+1$ breaks given the presence of l breaks ($l = 1, \dots, 4$), the unweighted maximization test and the weighted maximization tests.

procedures to define the number of breaks: the sequential procedure, the modified Schwarz criterion (LWZ) (Liu et al., 1997) and the Bayesian Information Criterion (BIC). We mainly focus on the sequential procedure and the BIC procedure. Finally, the break dates are estimated and the parameter estimates (and their standard errors) of the variables in the different subperiods are calculated. Table II summarizes the results. The entire output is presented in the Appendix (Table C. I).

*** Insert Table II here ***

For *Propensity to pay_{all stocks}* and *Initiate*, 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*, 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 world 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 dividends⁸. Our findings (available from the authors) remain the same.

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 improvements in investor protection (e.g., in 1873), nor with important changes in tax legislation (e.g., in 1920).⁹ Again, these results suggest a weak (at best) link between dividend policy and the institutional environment in which firms operate.

⁸ 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 from the authors, of the structural break analysis barely change by only taking into account regular dividend payments, regardless which of the four definitions are used.

⁹ In an unreported analysis, available from the authors, 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 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). Here, we find no break for *Propensity to pay_{all stocks}* nor for *Dividend yield*.

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 affected 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 III. Complete results are again reported in the Appendix (Table C. II).

For *Continue*, *Propensity to pay_{new} stocks* and *Dividend yield*, we find a break (Table II) 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* and *Dividend yield*, the break in the 1980s remains. For *Continue*, a new break appears in 1865. Before 1865, 95% of the paying stocks continue paying a dividend. From 1865 onwards, 90% maintain the dividend payment.¹⁰ 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.

*** Insert Table III here ***

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* and *Dividend yield*) are driven by the wars and not by taxation. First, as pointed out by Hardewyn (2003) and confirmed by contemporaneous newspapers (*L’Echo*

¹⁰ 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.

du Soir and *Moniteur des intérêts matériels*), 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 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}* and *Dividend yield* in the mid-1980s. This break in the mid-1980s coincides with a revival of the BSE. Figure 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

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.

*** Insert Figure 3 here ***

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 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.¹¹ 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.

*** Insert Figure 4 here ***

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

¹¹ 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.

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 2007.¹² 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.

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

¹² 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.

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 except for the *Propensity to pay_{new stocks}*. For the latter we use robust standard errors as this is not a continuous time series. Results of the regression analysis are reported in Table IV.

*** Insert Table IV here ***

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, 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. 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.

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}*,¹³ 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: 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. 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 from the analysis firm age, firm-dummies and the interaction-effect between firm age and the period-dummies. 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

¹³ As a robustness check, we also run the regression analysis for *Payer_{new firms}*. The results, available from the authors, remain the same.

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 from the authors, 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 V. To save space, we do not report the coefficient estimates of the control variables¹⁴. 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).

*** Insert Table V here ***

The results shown in Table V 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 regressions, except for *Initiate*. For this regression, we perform pairwise t-tests comparing dividend policy in different periods. We find

¹⁴ The complete output is available from the corresponding author.

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.

7. The (non) importance of dividend taxation

7.1. Regression analysis

In a similar framework as in Table V, 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), 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 VI.

*** Insert Table VI here ***

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 & 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 & 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 changes¹⁵. The results, reported in Table VII, indicate that firms generally do not shift dividends in response to dividend tax changes. Only for 1962¹⁶, 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.

¹⁵ 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 (available upon request) do not change materially.

¹⁶ 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 1947 system than under the 1962 system. Therefore, shifting the dividend to December 1961 leads to a less beneficial tax treatment.

*** Insert Table VII here ***

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 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 founded 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 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 protection under law.

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 recent decades, investor protection in Belgium has been 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 very important in the period before World War I, the gradual introduction of better investor protection measures 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 study 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, which affects the prevalence and severity of agency conflicts, information asymmetry and taxation, 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.

References

- Acheson, G.G., Campbell, G., Turner, J.D., 2016. Common law and the origin of shareholder protection, unpublished working paper.
- Acheson, G.G., Hickson, C.R., Turner, J.D., Ye, Q., 2009. Rule Britannia! British Stock Market Returns , 1825-1870. *J. Econ. Hist.* 69, 1107–1137.
- Allen, F., Michaely, R., 2003. Payout Policy, in: *Handbook of Economics & Finance*. pp. 337–430.
- Alstadsaeter, A., Kopczuk, W., Telle, K., 2013. Are Closely-held firms tax shelters? (No. 19609). Cambridge.
- Alzahrani, M., Lasfer, M., 2012. Investor protection, taxation, and dividends. *J. Corp. Financ.* 18, 745–762. doi:10.1016/j.jcorpfin.2012.06.003
- Bai, J., Perron, P., 2003. Computation and analysis of multiple structural change models. *J. Appl. Econom.* 18, 1–22. doi:10.1002/jae.659
- Bai, J., Perron, P., 1998. Estimating and Testing Linear Models with Multiple Structural Changes Published by : The Econometric Society. *Econometrica* 66, 47–78.
- Baker, M., Wurgler, J., 2004. A Catering Theory of Dividends. *J. Finance* 59, 1125–1165. doi:10.1111/j.1540-6261.2004.00658.x
- Bank, S., Cheffins, B., Goergen, M., 2009. Dividends and politics. *Eur. J. Polit. Econ.* 25, 208–224. doi:10.1016/j.ejpoleco.2009.01.002
- Bankcommissie, 1948. Jaarverslag Bankcommissie 1947-1948.
- Baudhuin, F., 1958. *Histoire économique de la Belgique 1945-1956*. Bruylant, Brussels.
- Bhattacharya, S., 1979. Imperfect Information , Dividend Policy , and “ the Bird in the Hand ” Fallacy. *Bell J. Econ.* 10, 259–270.
- Braggion, F., Moore, L., 2011. Dividend Policies in an Unregulated Market: The London Stock Exchange, 1895-1905. *Rev. Financ. Stud.* 24, 2935–2973. doi:10.1093/rfs/hhr026
- Buissert, A., 1943. *Manuel théorique et pratique des impôts sur les revenus*. Jardic, Brussels.
- Buissert, A., Cauwe, H., 1947. *Commentaire de la loi du 20 août 1947 modifiant la législation relative aux impôts sur les revenus*. Jardic, Brussels.
- Campbell, G., Turner, J.D., 2011. Substitutes for legal protection: corporate governance and dividends in Victorian Britain. *Econ. Hist. Rev.* 64, 571–597.
- Centre d'étude des Sociétés, 1956. *Le statuts des commissaires et des commissaires-reviseurs: Loi du 1er Décembre 1953 modifiant les lois coordonnées sur les sociétés commerciales*. Bruylant, Brussels.
- Centre d'étude des Sociétés, 1941. *La taxe professionnelle et la taxe mobilière à charge des sociétés*. Emile Bruylant, Brussels.
- Cheffins, B.R., 2006. Dividends as a Substitute for Corporate Law: The Separation of Ownership and Control in the United Kingdom. *Washingt. Lee Law Rev.* 63, 1273–1338.
- Chlepner, B.S., 1930. *Le marché financier Belge depuis cent ans*. Falk, Brussels.
- Commissie Corporate Governance, 2004. *Belgische Corporate Governance Code*.

- Coppens, P., Bailleux, A., 1985. *Droit fiscal: les impôts sur les revenus*. Larcier, Brussels.
- De Beule, N., 2003. *Roerende voorheffing en herstructurering: praktische benadering van de 10% heffing*. Lefebvre, Mechelen.
- De Clercq, G., 1992. *Ter Beurze: geschiedenis van de aandelenhandel in België, 1300-1990*. Van de Wiele, Brugge.
- De Mey, C., 1930. *Commentaire de la loi du 13 juillet 1930 modifiant les lois relatives aux impôts sur les revenus*. Emile Bruylant, Brussels.
- DeAngelo, H., DeAngelo, L., Stulz, R., 2006. Dividend policy and the earned/contributed capital mix: a test of the life-cycle theory. *J. financ. econ.* 81, 227–254. doi:10.1016/j.jfineco.2005.07.005
- De Voghel, F., 1941. *Le statut légal des banques et le régime des émission*. Bruylant, Brussels.
- Deloof, M., Roggeman, A., Van Overfelt, W., 2010. Bank affiliations and corporate dividend policy in pre-World War I Belgium. *Bus. Hist.* 52, 590–616. doi:10.1080/00076791003753178
- Demeur, A., 1874. *Les Sociétés Anonymes de Belgique, 1870 à mai 1873*. Stienon, Brussels.
- Demeur, A., 1870. *Les Sociétés Anonymes de Belgique, 1865 à 1869*. Stienon, Brussels.
- Demeur, A., 1865. *Les Sociétés Anonymes de Belgique, 1858 à 1864*. Stienon, Brussels.
- Demeur, A., 1859. *Les Sociétés Anonymes de Belgique en 1857*. Stienon, Brussels.
- Deswarte, W., 1942. *Beperking van dividenduitkeering door de Naamloze Vennootschappen en de Commanditaire Vennootschappen op aandelen*. Sikkell, Antwerpen.
- Dielen, W.L., 1933. *Les impôts sur les revenus*. Cappelen-lez-Anvers.
- Dimson, E., Marsh, P., Staunton, M., 2015. *Credit Suisse Global Investment Returns Sourcebook 2015*.
- Easterbrook, F.H., 1984. Two Agency-Cost Explanations of Dividends. *Am. Econ. Rev.* doi:10.2307/1805130
- Ergo Insurance Group, 2013. *Belasting- & Beleggingsgids 2013*. Pelckmans NV.
- Fama, E.F., French, K.R., 2001. Disappearing dividends: changing firm characteristics or lower propensity to pay? *J. financ. econ.* 60, 3–43.
- Floyd, E., Li, N., Skinner, D.J., 2014. *Payout policy through the financial crisis: the growth of repurchases and the resilience of dividends*, unpublished working paper.
- Foerster, S.R., Sapp, S.G., 2006. The changing role of dividends: a firm-level study from the nineteenth to the twenty-first century. *Can. J. Econ. Rev. Can. d'Economie* 39, 1316–1344. doi:10.1111/j.1540-5982.2006.00391.x
- Geens, K., 1990. *Openbaar bod en beschermingsconstructies: Recente evoluties in wetgeving en praktijk naar Belgisch, Nederlands en Europees recht*. Biblio, Kalmthout.
- Gilson, F., 1921. *Les impôts sur les bénéfices des sociétés anonymes: application des lois établissant l'impôt sur les revenus et l'impôts sur les bénéfices exceptionnels*. Emile Bruylant, Brussels.
- Guillery, J., 1886. *Commentaire législatif de la loi du 18 Mai 1873 sur les sociétés commerciales en Belgique*. Bruylant, Brussels.
- Hail, L., Tahoun, A., Wang, C., 2014. Dividend payouts and information shocks. *J. Account. Res.* 52,

403–456. doi:10.1111/1475-679X.12040

- Hanlon, M., Hoopes, J.L., 2014. What do firms do when dividend tax rates change? An examination of alternative payout responses. *J. financ. econ.* 114, 105–124. doi:10.1016/j.jfineco.2014.06.004
- Hardewyn, A., 2003. Tussen sociale rechtvaardigheid en economische efficiëntie: Een halve eeuw fiscaal beleid in België (1914-1962). VUBPress, Brussels.
- Hendrickx, B., Van gulck, W., 1991. Misbruik van voorwetenschap in vergelijkend perspectief. *Jura falconis* 361–399.
- Henry, R., 1967. *L'imposition des revenus mobiliers soumis à l'impôt des personnes physique: intérêts d'obligation et dividendes*. Emile Bruylant, Brussels.
- Homer, S., Sylla, R., 1991. *A history of interest rates*. Rutgers University Press, Londen.
- Jank, S., 2015. Changes in the Composition of Publicly Traded Firms: Implications for the Dividend-Price Ratio and Return Predictability. *Manag. Sci.* 61, 1362–1377. doi:10.1287/mnsc.2013.1883
- Jensen, M.C., 1986. Agency Costs of Free Cash Flow, Corporate Finance and Takovers. *Am. Econ. Rev.* 76, 323–329.
- Jiraporn, P., Ning, Y., 2006. Dividend policy, shareholder rights, and corporate governance. *J. Appl. Financ.* 16, 24–36.
- John, K., Knyazeva, A., Knyazeva, D., 2015. Governance and Payout Precommitment. *J. Corp. Financ.* 33, 101–117. doi:10.1016/j.jcorpfin.2015.05.004
- KBC, 1999. De inkoop van eigen aandelen. *Econ. Financ. Ber.* 1–12.
- Koo, D.S., Ramalingegowda, S., Yu, Y., 2017. The effect of financial reporting quality on corporate dividend policy. *Rev. Account. Stud.* 22, 753–790. doi:10.1007/s11142-017-9393-3
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R., 2000. Agency Problems and Dividend Policies around the World. *J. Finance* 55, 1–33.
- Lang, L.H.P., Litzenberger, R.H., 1989. Dividend announcements: Cash Flow Signaling vs. Free Cash Flow Hypothesis. *J. financ. econ.* 24, 181–191.
- Lapotre, C., 1924. *Les impôts sur les revenus: commentaire pratique des lois coordonnées sur la contribution foncière, la taxe mobilière, la taxe professionnelle et la supertaxe*. P. Michiels, Brussels.
- Liu, J., Wu, S., Zidek, J., 1997. On segmented multivariate regressions. *Stat. Sin.* 7, 497–525.
- Martynova, M., Renneboog, L., 2010. A corporate governance index (No. 2010–17), CentER Discussion Paper.
- Memento der effecten, 1997. . Brussels.
- Memento der effecten, 1994. . Brussels.
- Michotte, F., 1937. L'évolution des prix de détail en Belgique de 1830 à 1913. *Bull. l'Institut des Sci. économique* 8, 345–357.
- Miller, M.H., Rock, K., 1985. Dividend Policy under Asymmetric Information. *J. Finance* 40, 1031–1052.
- Neiryneck, M., 1944. *De Loonen in België sedert 1846*. De Standaard, Antwerpen.

- Newey, W.K., West, K.D., 1987. A Simple, Positive Semi-Definite, Heteroskedasticity and Autocorrelation Consistent Covariance Matrix Published by: The Econometric Society Stable URL : <http://www.jstor.org/stable/1913610> JSTOR is a not-for-profit service that helps scholars, research. *Econometrica* 55, 703–708.
- Nissim, D., Ziv, A., 2001. Dividend Changes and Future Profitability. *J. Finance* 56, 2111–2134.
- Op de Beeck, P., 2005. *De Belgische dividendregeling*. Larcier, Gent.
- Petersen, M.A., 2009. Estimating standard errors in finance panel data sets: Comparing approaches. *Rev. Financ. Stud.* 22, 435–480. doi:10.1093/rfs/hhn053
- Piret, R., 1946. *L'évolution de la législation belge sur les sociétés anonymes*. Casterman, Tournai.
- Requette, F., 1928. *Traité des impôts sur les revenus*. Ferdinand Larcier, Brussels.
- Sawicki, J., 2009. Corporate governance and dividend policy in Southeast Asia pre- and post-crisis. *Eur. J. Financ.* 15, 211–230. doi:10.1080/13518470802604440
- Tas, R., 2003. *Winstuitering, kapitaalvermindering en -verlies in NV en BVBA*. Biblo, Kalmthout.
- Théate, T., 1905. *Les sociétés anonymes: abus et remèdes*. Missch & Thron, Paris.
- Turner, J.D., Ye, Q., Zhan, W., 2013. Why Do Firms Pay Dividends?: Evidence from an Early and Unregulated Capital Market. *Rev. Financ.* 17, 1787–1826. doi:10.1093/rof/rfs048
- Van Damme, G., 1983. *Loi du 17 juillet 1975 relative à la comptabilité et aux comptes annuels des entreprises et arrêts d'exécution*. Brussels.
- Van de Velde, G., 1943. *Le rendement des placements (1856-1939)*. Société d'Etudes Morales, Sociales et Juridiques, Leuven.
- Van Lent, W., Sgourev, S.V., 2013. Local Elites Versus Dominant Shareholders : Dividend Smoothing at the Dutch East India Company, in: *Academy of Management Annual Meeting Proceedings*. pp. 1127–1132. doi:10.5465/AMBPP.2013.230
- Van Overfelt, W., Deloof, M., Vanstraelen, A., 2010. Determinants of Corporate Financial Disclosure in an Unregulated Environment: Evidence from the Early 20th Century. *Eur. Account. Rev.* 19, 7–34. doi:10.1080/09638180902731539
- Vanheurck, J., 1954. *Les Finances Publiques Pendant l'Occupation Allemande de 1940 à 1945*, in: *Institut Belge de Finances Publiques (Ed.), Histoire Des Finances Publiques, Volume 2*. Bruylant, Brussels, pp. 401–439.
- Vanthienen, L., Vermaelen, T., 1987. The effect of personal taxes on common stock prices. *J. Bank. Financ.* 11, 223–244.
- Wauwermans, P., 1914. *Manuel pratique des sociétés anonymes*. Bruylant, Brussels.
- Willems, H., 2000. Het meervoudig stemrecht in de algemene aandeelhoudersvergadering in België tijdens het Interbellum. *Belgisch Tijdschr. voor Nieuwste Geschied.* 3, 431–492.

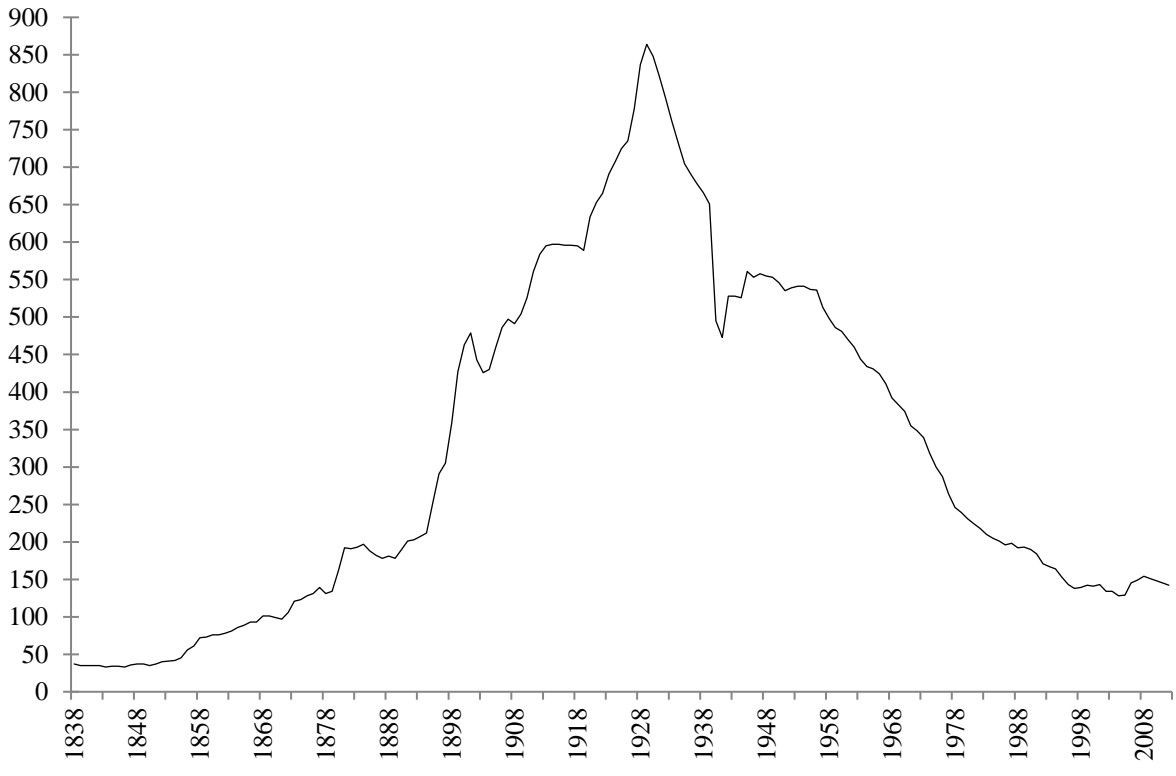


Figure 1. Evolution in number of stocks on the BSE, 1838–2012. This figure shows the evolution in the number of listed stocks in our sample.

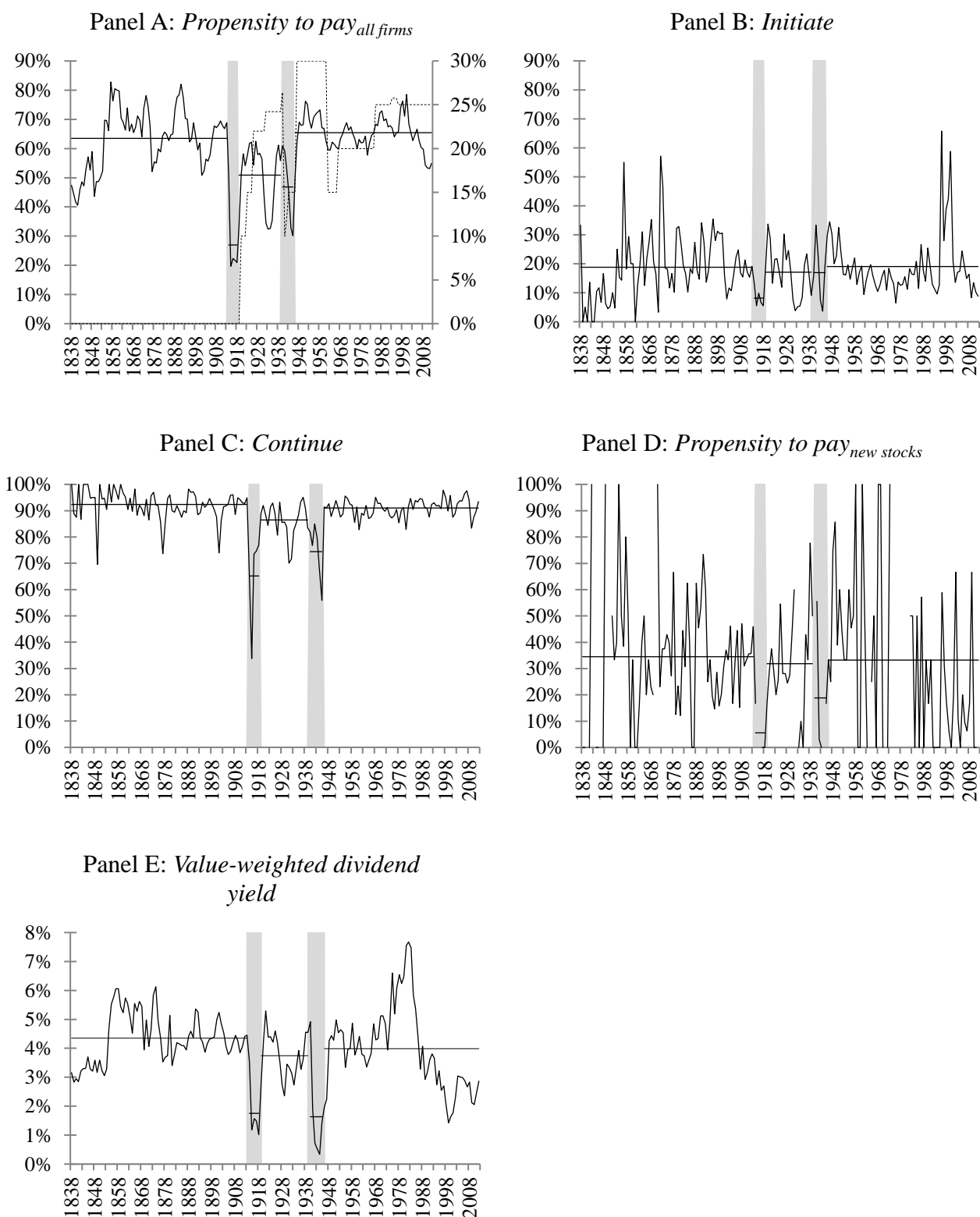


Figure 2. Evolution of dividend policy, 1838–2012. This figure shows the evolution in dividend policy between 1838 and 2012. The horizontal lines in each panel represent the means of the different variables in different periods (1838–1913); 1914–1918 (World War I, shaded area); 1919–1939; 1940–1945 (World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

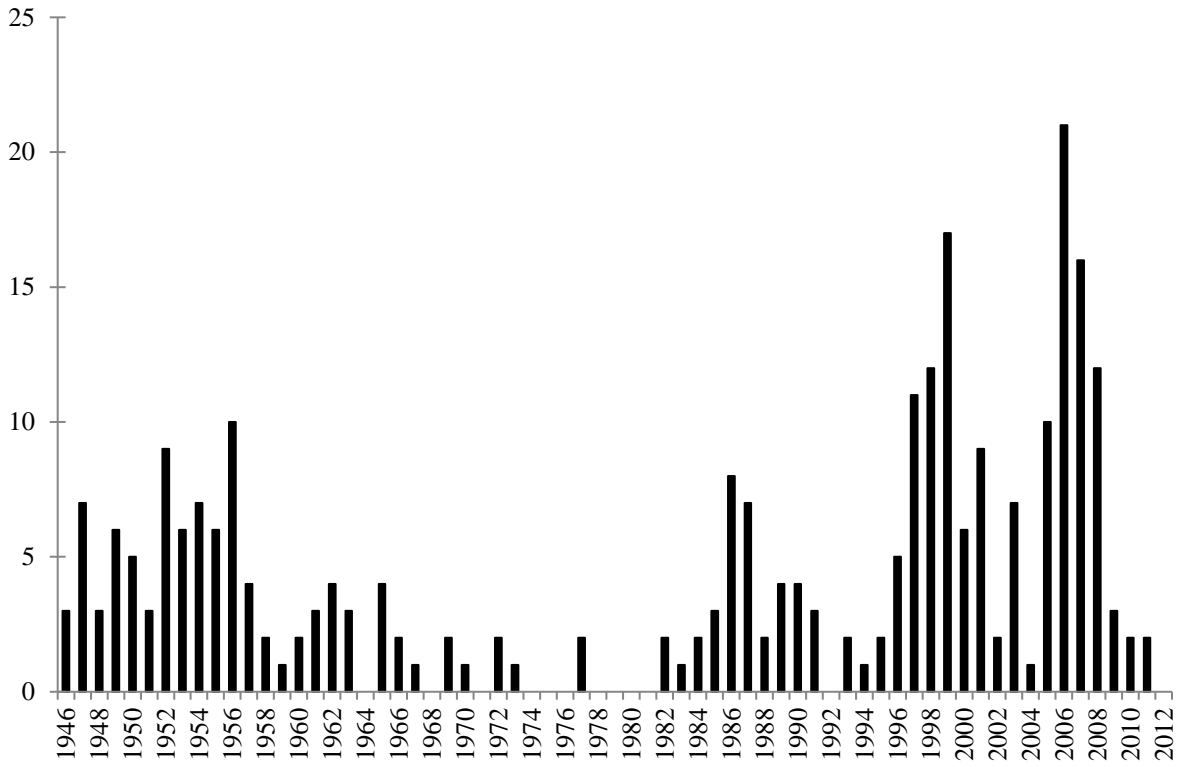


Figure 3. Evolution in number of IPOs, 1946–2012. This figure shows evolution in the number of new firms introduced on the BSE in the post–World War II period.

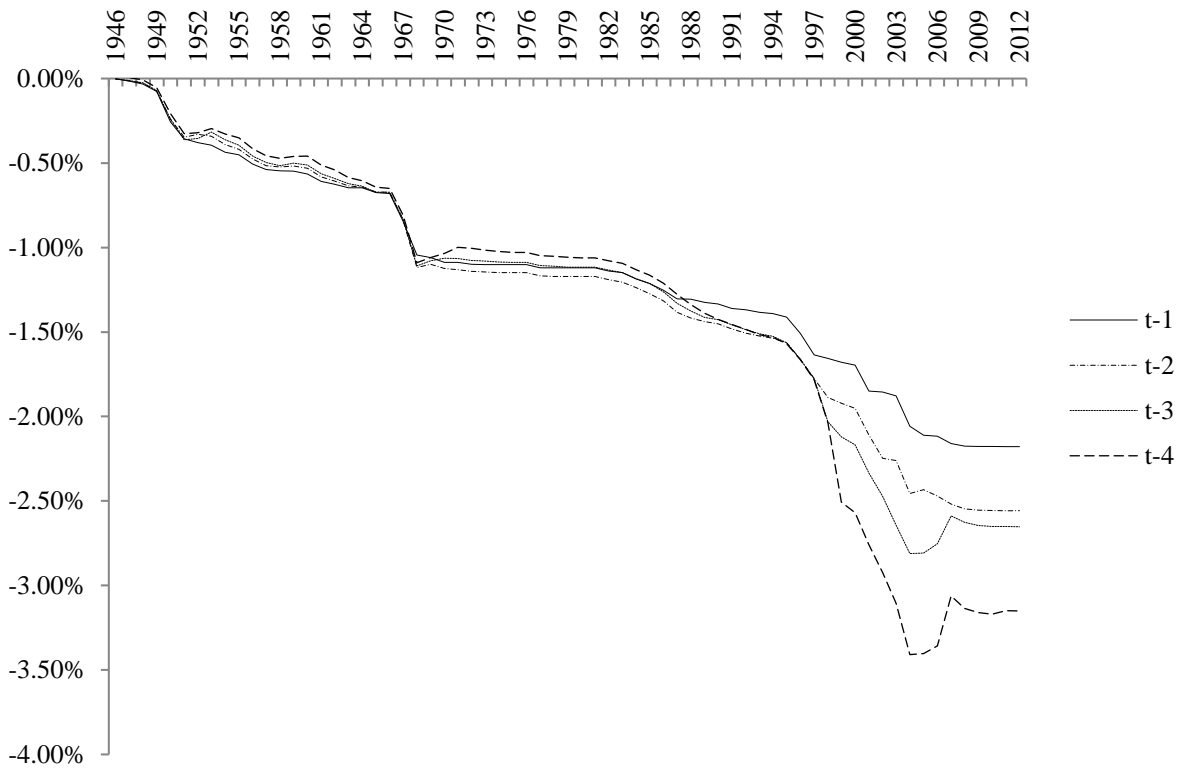


Figure 4. Cumulative difference in dividend yield of all stocks and continuously listed stocks, 1946–2012. This figure shows evolution of the difference in dividend yield of all stocks listed on the BSE and all continuously listed stocks. A stock is considered to be continuously listed if it is in the 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 introduction of one new stock that does not pay a dividend.

Table I. Evolution of dividend taxation in Belgium

This table shows evolution of the Belgian dividend taxation system. A distinction is made between direct dividend taxation (here the dividend tax rate is shown) and 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.

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).

| | <i>Dividend tax rate</i> | <i>Tax on company profits?</i> | <i>Taxed as part of personal income of taxpayer?</i> |
|------|--------------------------|--------------------------------|--|
| 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 |

Table II. 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: <i>Propensity to pay_{all} stocks</i> | | | | |
|--|------------------|-----------|-----------|-----------|
| Break points | No breaks | | | |
| Periods | 1838-2012 | | | |
| Parameter estimates | 61.09% | | | |
| Panel B: <i>Initiate</i> | | | | |
| Break points | No breaks | | | |
| Periods | 1838-2012 | | | |
| Parameter estimates | 18.33% | | | |
| Panel C: <i>Continue</i> | | | | |
| Break points | 1913, 1945 | | | |
| Periods | 1838-1913 | 1914-1945 | 1946-2012 | |
| Parameter estimates | 92.38% | 80.89% | 91.09% | |
| Panel D: <i>Propensity to pay_{new} stocks</i> | | | | |
| Break points | 1983 | | | |
| Periods | 1838-1983 | 1984-2012 | | |
| Parameter estimates | 35.87% | 18.55% | | |
| Panel E: <i>Dividend yield</i> | | | | |
| Break points | 1914, 1947, 1986 | | | |
| Periods | 1838-1914 | 1915-1947 | 1948-1986 | 1987-2012 |
| Parameter estimates | 4.35% | 2.98% | 4.90% | 2.76% |

Table III. Structural break analysis—Excluding World Wars (1914–1918; 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 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 37.21%; in the second period, it is 18.55%.

| Panel A: <i>Propensity to pay_{all firms}</i> | | |
|--|-----------|-----------|
| Break points | No breaks | |
| Periods | 1838-2012 | |
| Parameter estimates | 62.65% | |
| Panel B: <i>Initiate</i> | | |
| Break points | No breaks | |
| Periods | 1838-2012 | |
| Parameter estimates | 18.69% | |
| Panel C: <i>Continue</i> | | |
| Break points | 1865 | |
| Periods | 1838-1865 | 1866-2012 |
| Parameter estimates | 94.55% | 90.35% |
| Panel D: <i>Propensity to pay_{all stocks}</i> | | |
| Break points | 1983 | |
| Periods | 1838-1982 | 1983-2012 |
| Parameter estimates | 37.21% | 18.55% |
| Panel E: <i>Dividend yield</i> | | |
| Break points | 1986 | |
| Periods | 1838-1986 | 1987-2012 |
| Parameter estimates | 4.38% | 2.76% |

Table IV. 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 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 pay_{new 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 at the 10%, 5% and 1% level, respectively

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

Table V. 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 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 %). Coefficient estimates 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-tests 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. *, ** and *** represent significance at the 10%, 5% and 1% level, respectively

| Panel A: Regression analysis | | | | | |
|---|-----------------------|---------------------|----------------------|-----------------------|---------------------|
| | $Payer_{all\ stocks}$ | $Initiate$ | $Continue$ | $Payer_{new\ stocks}$ | $Dividend\ yield$ |
| 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% | |
| World War I | -2.655 (1.998) | -2.003 (2.338) | 3.142* (1.820) | -33.723*** (1.404) | 2.645** (1.138) |
| Interbellum | -1.601 (1.643) | -0.117 (1.597) | 4.292** (1.741) | 1.071 (1.334) | 2.035 (1.549) |
| World War II | 5.501*** (1.999) | 6.182*** (2.111) | 11.327*** (1.743) | omitted | 9.860*** (1.924) |
| Early post-war | 0.955 (1.830) | 4.550** (1.970) | 6.821*** (2.148) | 2.107 (2.720) | 2.758 (1.991) |
| Late post-war | 3.222 (3.592) | 6.672* (3.674) | 7.496 (4.712) | -1.645 (1.331) | -1.318 (2.996) |
| 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. | |

Table VI. 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). Coefficients and standard errors (between parentheses) are shown. Standard errors are clustered by as well firm as year (Petersen, 2009). *, ** and *** represent significance at the 10%, 5% and 1% level, respectively

| | <i>Payer_{all stocks}</i> (1) | <i>Initiate</i> (2) | <i>Continue</i> (3) | <i>Payer_{new stocks}</i> (4) | <i>Dividend yield</i> (5) |
|---------------------------------|--|------------------------|------------------------|--|------------------------------|
| 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% | |
| Direct dividend tax rate (ddt) | -2.401 (1.662) | 1.394 (1.061) | -1.120 (1.837) | -0.493 (1.031) | 1.001 (1.623) |
| Personal income tax dummy (pit) | 0.216 (0.406) | 1.828*** (0.631) | 0.527 (0.557) | 0.439 (0.291) | 0.615 (0.558) |
| Ddt * pit | -0.236 (2.110) | -7.456** (3.368) | -1.628 (2.794) | -1.828 (1.575) | 1.566 (3.761) |
| Ln(age) | -0.468*** (0.084) | -1.061*** (0.068) | -0.775*** (0.097) | | -0.509*** (0.116) |
| Ln(size) | 0.737*** (0.086) | 0.730*** (0.063) | 0.713*** (0.097) | 0.025 (0.034) | 0.246*** (0.068) |
| Inflation | -1.143 (0.628) | -0.240 (0.323) | -1.621* (0.638) | -0.358 (0.596) | -1.351* (0.562) |
| Interest rate | -0.031 (0.038) | -0.017 (0.031) | -0.014 (0.038) | -0.041 (0.057) | 0.078 (0.047) |

Table VII . Do firms shift their dividends in response to tax rate changes?

This table shows the results of the regression of the ratio of December dividends of year t to the January dividends of year $t+1$ on an indicator variable equal to 1 for observations in the year prior to and 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. Coefficients and standard errors (between parentheses) are shown. *, ** and *** represent significance at the 10%, 5% and 1% level, respectively

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

Appendix A: Data sources

Table A. I. Data sources used to construct the time series of inflation and short-term interest rate

| | |
|--|---|
| Panel A: Stock information (end-of-month stock prices, dividend information and capital information) | |
| 1838–2012 | Database of the Studiecentrum voor Onderneming en Beurs (SCOB). |
| Panel B: Inflation | |
| 1838–1920 | Michotte (1937) and Van de Velde (1943) |
| 1921–1939 | Ministry of Economic Affairs |
| 1940–1946 | National Bank of Belgium: combination of official price index (three-quarters) and index of black market (one-quarter) |
| 1947–2012 | Ministry of Economic Affairs |
| Panel C: 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 | Data of the 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 B: Summary statistics

Appendix Table B. 1 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 *Propensity to pay_{all firms}*, *Initiate*, *Continue*, *Propensity to pay_{new firms}* and *Value-weighted dividend yield*.

| Panel A: <i>Propensity to pay_{all stocks}</i> | | | | | | |
|--|-----------|-----------|-----------|-----------|-----------|-----------|
| | 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: <i>Initiate</i> | | | | | | |
| | 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: <i>Continue</i> | | | | | | |
| | 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: <i>Propensity to pay_{new stocks}</i> | | | | | | |
| | 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: <i>Value-weighted dividend yield</i> | | | | | | |
| | 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 C: Structural Break Analysis

Table C.1 Output structural break analysis—original variables

| Panel A: <i>Propensity to pay</i> _{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: <i>Initiate</i> | | | | |
| 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: <i>Continue</i> | | | | |
| 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 | | | | |
| $\widehat{\beta}_1$ | $\widehat{\beta}_2$ | $\widehat{\beta}_3$ | | |
| 0.9238 (0.0079) | 0.8089 (0.0121) | 0.9101 (0.0084) | | |
| \widehat{T}_1 | \widehat{T}_2 | | | |
| 1913 | 1945 | | | |

| Panel D: <i>Propensity to pay_{new stocks}</i> | | | | |
|--|-------------------------|-------------------------|-------------------------|-----------------------|
| 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 | | | | |
| $\widehat{\beta}_1$ | $\widehat{\beta}_2$ | | | |
| 0.3587 | 0.1855 | | | |
| (0.0237) | (0.0502) | | | |
| \widehat{T}_1 | | | | |
| 1983 | | | | |

| Panel E: <i>Dividend yield</i> | | | | |
|--------------------------------|-------------------------|-------------------------|-------------------------|-----------------------|
| 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 | | | | |
| $\widehat{\beta}_1$ | $\widehat{\beta}_2$ | $\widehat{\beta}_3$ | $\widehat{\beta}_4$ | |
| 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 | | |

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

Table C. II Output structural break analysis—no wars included

| Panel A: <i>Propensity to pay</i> 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: <i>Initiate</i> | | | | |
| 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: <i>Continue</i> | | | | |
| 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 | | | | |
| $\widehat{\beta}_1$ | $\widehat{\beta}_2$ | | | |
| 0.9455 | 0.9035 | | | |
| (0.0097) | (0.0044) | | | |
| \widehat{T}_1 | | | | |
| 1865 | | | | |

| Panel D: <i>Propensity to pay_{new stocks}</i> | | | | |
|--|-------------------------|---------------------------|-------------------------|-----------------------|
| 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 (***) | | | |
| Sequential procedure | | Number of breaks selected | | |
| LWZ | | | | 1 |
| BIC | | | | 0 |
| | | | | 1 |
| | | Estimates with one break | | |
| $\widehat{\beta}_1$ | $\widehat{\beta}_2$ | | | |
| 0.3721 (0.0242) | 0.1855 (0.0499) | | | |
| \widehat{T}_1 | | | | |
| 1983 | | | | |

| Panel E: <i>Dividend yield</i> | | | | |
|------------------------------------|-------------------------|---------------------------|-------------------------|-----------------------|
| 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 (***) | | | |
| Sequential procedure | | Number of breaks selected | | |
| LWZ | | | | 1 |
| BIC | | | | 2 |
| | | | | 2 |
| | | Estimates with one break | | |
| $\widehat{\beta}_1$ | $\widehat{\beta}_2$ | | | |
| 0.0438 (8.4777e ⁻⁴) | 0.0276 (0.0020) | | | |
| \widehat{T}_1 | | | | |
| 1986 | | | | |

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

Investor protection, Taxation and Dividend Policy: Long-run evidence, 1838-2012

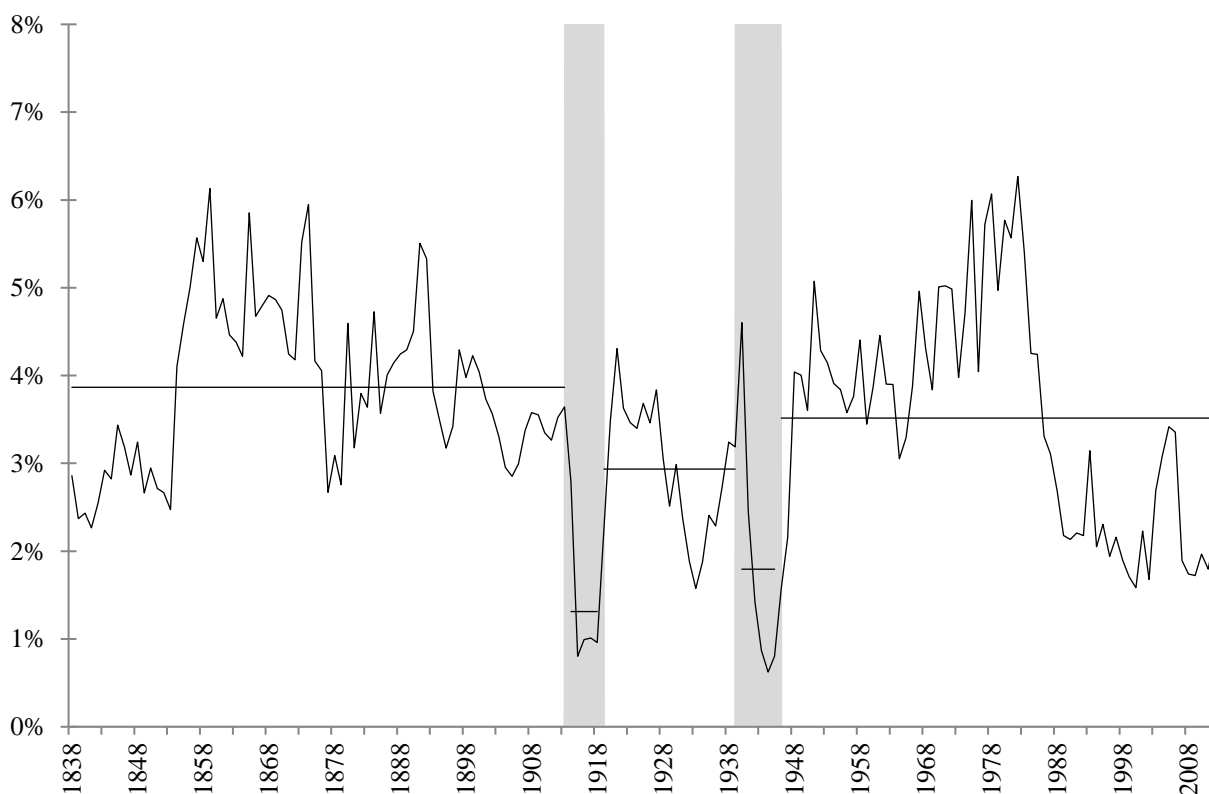
Internet Appendix with unreported results

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 - Figure 1 and Appendix - Table I 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 - 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 - Table 1 The evolution of the equally-weighted dividend yield

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

| | <i>Equally-weighted dividend yield</i> | | | | | |
|--------|--|-----------|-----------|-----------|-----------|-----------|
| | 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 - Table II 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 - Table III contains the entire output of the structural break analysis. We refer to the Appendix of the paper for the interpretation of this output.

Appendix - Table II Structural break analysis (summarized results)

In this table, the results of the structural break analysis are summarized. For each dividend measure, the break points, the different periods and the parameter estimates in the different 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 - Table III 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 | | |
| $\widehat{\beta}_1$ | $\widehat{\beta}_2$ | $\widehat{\beta}_3$ | $\widehat{\beta}_4$ | |
| 0.0387 (0.0010) | 0.0243 (0.0015) | 0.0446 (0.0015) | 0.0231 (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 | | |
| $\widehat{\beta}_1$ | $\widehat{\beta}_2$ | | | |
| 0.0385 (8.20 e ⁻⁴) | 0.0224 (0.0019) | | | |
| \widehat{T}_1 | | | | |
| 1987 | | | | |

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

2. Regular dividends

The *Value-weighted dividend yield* includes both regular and special dividends. In order to investigate whether our results hold by only taking into account regular dividends, we repeat the structural break analysis for dividend yield only including regular dividends

Given the 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). Summarized results are reported in *Appendix - Table IV*, the entire output of the structural break analysis is reported in *Appendix - Table V*. The results of the structural break analysis barely change by only taking into account regular dividend payments, regardless which of the four definitions are used.

Appendix - Table IV Structural break analysis for *Value-weighted dividend yield* calculated using only regular dividends (summarized results)

| Panel A: Special dividends identified as additional dividend payment | | | | |
|--|------------------|-----------|-----------|-----------|
| Break points | 1913, 1947, 1986 | | | |
| Periods | 1838-1913 | 1914-1947 | 1948-1986 | 1987-2012 |
| Parameter estimates | 4.09% | 2.76% | 4.84% | 2.58% |
| Panel B: Special dividends identified as (at least) double dividend | | | | |
| Break points | 1913, 1947, 1986 | | | |
| Periods | 1838-1913 | 1914-1947 | 1948-1986 | 1987-2012 |
| Parameter estimates | 4.07% | 2.76% | 4.79% | 2.56% |

| Panel C: Special dividends identified by winsorizing at the 99 th percentile | | | | |
|---|------------------|-----------|-----------|-----------|
| Break points | 1913, 1947, 1986 | | | |
| Periods | 1838-1913 | 1914-1947 | 1948-1986 | 1987-2012 |
| Parameter estimates | 4.06% | 2.73% | 4.68% | 2.50% |
| Panel D: Special dividends identified by winsorizing at the 95 th percentile | | | | |
| Break points | 1913, 1947, 1986 | | | |
| Periods | 1838-1913 | 1914-1947 | 1948-1986 | 1987-2012 |
| Parameter estimates | 4.12% | 2.84% | 4.79% | 2.61% |

Appendix - Table V Structural break analysis for *Value-weighted dividend yield* calculated using only regular dividends (entire output)

| Panel A: Special dividend identified as additional dividend payment | | | | |
|---|-------------------------|-----------------------------|-------------------------|-----------------------|
| | | 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) |
| 8.45 | 5.98 | 7.38 | 6.88 | 4.90 |
| (*) | | (**) | (***) | (**) |
| SupF _T (2 1) | SupF _T (3 2) | SupF _T (4 3) | SupF _T (5 4) | |
| 2.54 | 2.18 | 0.11 | 0 | |
| Udmax | Wdmax | | | |
| 8.45 | 8.45 | | | |
| (*) | (*) | | | |
| | | Number of breaks selected | | |
| Sequential procedure | | | | 1 |
| LWZ | | | | 3 |
| BIC | | | | 3 |
| | | Estimates with three breaks | | |
| $\widehat{\beta}_1$ | $\widehat{\beta}_2$ | $\widehat{\beta}_3$ | $\widehat{\beta}_4$ | |
| 0.0409 | 0.0276 | 0.0484 | 0.0258 | |
| (0.0012) | (0.0017) | (0.0016) | (0.0020) | |
| \widehat{T}_1 | \widehat{T}_2 | \widehat{T}_3 | | |
| 1913 | 1947 | 1986 | | |

| Panel B: Special dividend identified as (at least) double dividend | | | | |
|--|-------------------------|---------------------------|-------------------------|-----------------------|
| | | 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) |
| 8.83 | 6.25 | 7.15 | 6.83 | 4.88 |
| (**) | | (**) | (***) | (**) |
| SupF _T (2 1) | SupF _T (3 2) | SupF _T (4 3) | SupF _T (5 4) | |
| 2.83 | 2.31 | 0.07 | 0 | |
| UDmax | WDmax | | | |
| 8.84 | 8.84 | | | |
| (*) | (*) | | | |
| | | Number of breaks selected | | |
| Sequential procedure | | | | 1 |
| LWZ | | | | 3 |
| BIC | | | | 3 |

| Estimates with three breaks | | | |
|-----------------------------|---------------------|---------------------|---------------------|
| $\widehat{\beta}_1$ | $\widehat{\beta}_2$ | $\widehat{\beta}_3$ | $\widehat{\beta}_4$ |
| 0.0409 (0.0012) | 0.0276 (0.0017) | 0.0484 (0.0016) | 0.0258 (0.0020) |
| \widehat{T}_1 | \widehat{T}_2 | \widehat{T}_3 | |
| 1913 | 1947 | 1986 | |

Panel C: Special dividends identified by winsorizing at the 99th percentile

| $z_t = (1)$ | $q = 1$ | Specifications | | |
|-------------------------|-------------------------|-----------------------------|-------------------------|-----------------------|
| | | $p = 0$ | $h = 26$ | $M = 5$ |
| | | Tests | | |
| SupF _T (1) | SupF _T (2) | SupF _T (3) | SupF _T (4) | SupF _T (5) |
| 9.69 (**) | 6.84 (*) | 8.51 (***) | 8.87 (***) | 7.00 (***) |
| SupF _T (2 1) | SupF _T (3 2) | SupF _T (4 3) | SupF _T (5 4) | |
| 2.41 | 2.55 | 0.78 | 0 | |
| Udmax | Wdmax | | | |
| 9.69 (**) | 9.69 (**) | | | |
| | | Number of breaks selected | | |
| Sequential procedure | | | | 1 |
| LWZ | | | | 3 |
| BIC | | | | 3 |
| | | Estimates with three breaks | | |
| $\widehat{\beta}_1$ | $\widehat{\beta}_2$ | $\widehat{\beta}_3$ | $\widehat{\beta}_4$ | |
| 0.0406 (0.0011) | 0.0273 (0.0017) | 0.0468 (0.0016) | 0.0250 (0.0019) | |
| \widehat{T}_1 | \widehat{T}_2 | \widehat{T}_3 | | |
| 1913 | 1947 | 1986 | | |

Panel D: Special dividends identified by winsorizing at the 95th percentile

| $z_t = (1)$ | $q = 1$ | Specifications | | |
|-------------------------|-------------------------|-----------------------------|-------------------------|-----------------------|
| | | $p = 0$ | $h = 26$ | $M = 5$ |
| | | Tests | | |
| SupF _T (1) | SupF _T (2) | SupF _T (3) | SupF _T (4) | SupF _T (5) |
| 8.70 (*) | 6.16 | 6.97 (**) | 7.05 (***) | 4.81 (**) |
| 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 | | | |
| 8.70 (*) | 8.70 (*) | | | |
| | | Number of breaks selected | | |
| Sequential procedure | | | | 1 |
| LWZ | | | | 3 |
| BIC | | | | 3 |
| | | Estimates with three breaks | | |
| $\widehat{\beta}_1$ | $\widehat{\beta}_2$ | $\widehat{\beta}_3$ | $\widehat{\beta}_4$ | |
| 0.0412 (0.0011) | 0.0284 (0.0017) | 0.0479 (0.0016) | 0.0261 (0.0020) | |
| \widehat{T}_1 | \widehat{T}_2 | \widehat{T}_3 | | |
| 1913 | 1947 | 1986 | | |

3. 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 - Table VI, the entire output is shown in Appendix - Table VII.

Appendix - Table VI Structural break analysis (summarized results)

In this table, the results of the structural break analysis 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 - Table VII Structural break analysis (entire output)

| Panel A: Propensity to pay (long-lived firms) | | | | |
|---|-------------------------|----------------------------------|-------------------------|-----------------------|
| $z_t = (1)$ | $q = 1$ | Specifications p = 0 Tests | $h = 26$ | $M = 5$ |
| 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 | | | | |
| $z_t = (1)$ | $q = 1$ | $p = 0$ Tests | $h = 26$ | $M = 5$ |
| SupF _T (1) 3.39 | SupF _T (2) 3.20 | SupF _T (3) 3.32 | SupF _T (4) 3.62 | SupF _T (5) 2.71 |
| SupF _T (2 1) 1.86 | SupF _T (3 2) 2.02 | SupF _T (4 3) 0.10 | SupF _T (5 4) 0 | |
| UDmax 3.62 | WDmax 3.62 | | | |
| | | Number of breaks selected | | |
| Sequential procedure | | | | 0 |
| LWZ | | | | 3 |
| BIC | | | | 3 |
| | | No breaks selected | | |

4. 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 - Table VIII shows the entire output of the base regression. Appendix - Table IX and Appendix - Table X 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. *Continue* 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.

4.1 Coefficient estimates of control variables

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

| Panel A: Regression analysis | | | | | |
|------------------------------|-----------------------------------|----------------------|----------------------|-----------------------------------|-----------------------|
| | <i>Payer_{all stocks}</i> | <i>Initiate</i> | <i>Continue</i> | <i>Payer_{new stocks}</i> | <i>Dividend yield</i> |
| | (1) | (2) | (3) | (4) | (5) |
| 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% | |
| World War I | -2.655 (1.998) | -2.003 (2.338) | 3.142* (1.820) | -33.723*** (1.404) | 2.645** (1.138) |
| Interbellum | -1.601 (1.643) | -0.117 (1.597) | 4.292** (1.741) | 1.071 (1.334) | 2.035 (1.549) |
| World War II | 5.501*** (1.999) | 6.182*** (2.111) | 11.327*** (1.743) | | 9.860*** (1.924) |
| Early post-war | 0.955 (1.830) | 4.550** (1.970) | 6.821*** (2.148) | 2.107 (2.720) | 2.758 (1.991) |
| Late post-war | 3.222 (3.592) | 6.672* (3.674) | 7.496 (4.712) | -1.645 (1.331) | -1.318 (2.996) |
| Age | 0.008 (0.082) | -0.561*** (0.084) | -0.190** (0.096) | | -0.140 (0.114) |
| Age * World War I | -0.527*** (0.141) | -0.107 (0.301) | -0.068 (0.144) | | -0.331 (0.166) |
| Age * Interbellum | -0.511*** (0.150) | -0.190 (0.152) | -0.325** (0.128) | | -0.008 (0.175) |
| Age * World War II | -0.827*** (0.264) | -0.672** (0.318) | -0.480* (0.264) | | -0.420 (0.278) |
| Age * early post-war | -1.469*** (0.336) | -1.319*** (0.341) | -0.975*** (0.260) | | -0.085 (0.266) |
| Age * late post-war | -0.789*** (0.392) | -1.037** (0.529) | 0.517 (0.447) | | 0.658 (0.393) |
| Size | 1.232*** (0.087) | 1.016*** (0.083) | 1.260*** (0.114) | 0.097* (0.057) | 0.610*** (0.114) |
| Size * World War I | 0.0310 (0.104) | -0.032 (0.136) | -0.420*** (0.112) | 2.081*** (0.091) | -0.361*** (0.101) |
| Size * Interbellum | 0.027 (0.108) | -0.031 (0.102) | -0.356*** (0.112) | -0.077 (0.085) | -0.215** (0.105) |
| Size * World War II | -0.450*** (0.099) | -0.398*** (0.130) | -0.842*** (0.096) | | -0.703*** (0.094) |
| Size * early post-war | 0.0404 (0.097) | -0.082 (0.097) | -0.379*** (0.111) | -0.097 (0.146) | -0.230** (0.112) |
| Size * late post-war | -0.257 (0.171) | -0.288** (0.140) | -0.520** (0.228) | 0.017 (0.074) | -0.299*** (0.114) |
| Inflation | 0.752 (0.584) | 1.020** (0.512) | 0.537 (0.572) | -0.104 (0.627) | 0.628 (0.661) |
| Short-term interest rate | -0.002 (0.029) | 0.025 (0.032) | -0.010 (0.028) | -0.006 (0.054) | 0.110*** (0.035) |

4.2 Robustness check I – $\text{payer}_{\text{new firms}}$ instead of $\text{payer}_{\text{new stock}}$

Appendix - Table IX Propensity to pay of newly listed firms, controlling for size, inflation, short-term interest rates and firm-fixed effects.

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

4.3 Robustness check II – measuring age and size differently

Appendix - Table X 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. 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.

| Panel A: Regression analysis | | | | | |
|------------------------------|-----------------------------------|----------------------|----------------------|-----------------------------------|-----------------------|
| | <i>Payer_{all stocks}</i> | <i>Initiate</i> | <i>Continue</i> | <i>Payer_{new stocks}</i> | <i>Dividend yield</i> |
| | (1) | (2) | (3) | (4) | (5) |
| 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% | |
| World War I | -2.735** (0.920) | -2.529** (0.842) | -2.505*** (0.688) | -7.959*** (0.132) | -2.165*** (0.561) |
| Interbellum | -0.400 (0.477) | 0.788 (0.481) | 0.101 (0.451) | -0.139 (0.213) | -0.476 (0.491) |
| World War II | 0.206 (0.713) | 1.513* (0.746) | 0.393 (0.743) | | -0.568 (0.614) |
| Early post-war | 0.762 (0.685) | 2.309** (0.745) | 0.974 (0.637) | 0.426 (0.341) | 0.946 (0.702) |
| Late post-war | 1.154 (0.819) | 2.351* (0.949) | 1.540** (0.762) | -1.185*** (0.312) | -1.759 (1.014) |
| Age | -0.297 (0.305) | -1.967*** (0.370) | -0.764*** (0.293) | | -0.348 (0.411) |
| Age * World War I | -0.591 (0.476) | -0.090 (0.687) | 0.084 (0.494) | | -0.125 (0.463) |
| Age * Interbellum | -1.212* (0.599) | -1.272* (0.615) | -1.297** (0.540) | | -0.671 (0.624) |
| Age * World War II | -1.522* (0.751) | -1.809* (0.857) | -1.247* (0.750) | | -1.484* (0.721) |
| Age * early post-war | -2.248** (0.750) | -2.723*** (0.767) | -1.656** (0.682) | | -1.605* (0.743) |
| Age * late post-war | -1.068 (0.840) | -2.064 (1.077) | -0.683 (0.791) | | 0.313 (0.949) |
| Size | 6.737*** (0.451) | 5.540*** (0.481) | 4.878*** (0.395) | -4.517 (1.712) | 2.537*** (0.460) |
| Size * World War I | -1.023 (0.536) | -0.981 (0.731) | -1.559*** (0.523) | 328.146*** (3.215) | -1.387** (0.531) |
| Size * Interbellum | -0.490 (0.505) | -0.640 (0.473) | -0.580 (0.479) | -0.661 (3.580) | 0.227 (0.495) |
| Size * World War II | -2.484* (0.772) | -2.467** (0.895) | -2.790*** (0.606) | | -1.480 (1.159) |
| Size * early post-war | 0.388 (0.548) | -0.411 (0.554) | -0.236 (0.443) | 7.478 (20.085) | 0.3220 (0.559) |
| Size * late post-war | 0.277 (0.671) | 0.522 (0.821) | -1.107* (0.648) | 6.748* (2.815) | 0.422 (0.709) |
| Inflation | 1.043 (0.593) | 1.43** (0.504) | 0.921* (0.555) | 0.004 (0.619) | 0.944 (0.622) |
| Short-term interest rate | 0.034 (0.023) | 0.016 (0.024) | 0.003 (0.023) | 0.012 (0.053) | 0.136*** (0.032) |

| Panel B: Wald Tests | | | | | | |
|---------------------|-----------------------------------|-----------------|-----------------|-----------------------------------|-----------------------|--|
| | <i>Payer_{all stocks}</i> | <i>Initiate</i> | <i>Continue</i> | <i>Payer_{new stocks}</i> | <i>Dividend yield</i> | |
| | (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 | | | | | |
|---------------------------------------|-------------|--------------|----------------|---------------|-------|
| <i>Payer_{all stocks}</i> (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. | |
| <i>Initiate</i> (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. | |
| <i>Continue</i> (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. | |
| <i>Payer_{new stocks}</i> (4) | Interbellum | World War II | Early post-war | Late post-war | |
| World War I | -.*** | | -.*** | -.*** | -.*** |
| Interbellum | | | N.S. | +*** | |
| World War II | | | | | |
| Early post-war | | | | +*** | |
| <i>Dividend yield</i> (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 | | | | +*** | |

5. Shifting dividends

Similar to Hanlon & Hoopes (2014), we investigate whether firms shift their 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 $t+1$ in order to benefit from the lower dividend tax rate. 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 & 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. Results are reported in Appendix - Table XI. We estimate the regression models using five years of data prior and after the tax rate changes (Panel A), fifteen years of data prior and after the tax rate change (Panel B) and twenty years of data prior and after the tax rate change (Panel C).

Appendix - Table XI Do firms shift their dividends in response to tax rate changes?

This table shows the results of the regression of the ratio of December dividends of year t to the January dividends of year $t+1$ on an indicator variable equal to 1 for observations in the year prior to and 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. Coefficients and standard errors (between parentheses) are shown. *, ** and *** represent significance of 10%, 5% and 1%, respectively

| Panel A: Regressions using eleven years of data (five years prior to and after the tax rate change) | | | | | |
|---|-------------|----------------------|----------------------|----------------------|---------------------|
| | Expectation | 1915-1925 | 1936-1946 | 1942-1952 | 1957-1967 |
| Indicator 1919/1920 (tax rate: 0% → 10%) | + | 0.1142 (0.14) | | | |
| Indicator 1940/1941 (tax rate: 26.4% → 10%) | - | | 0.1719 (0.35) | | |
| Indicator 1946/1947 (tax rate: 15% → 30%) | + | | | 0.6511 (1.42) | |
| Indicator 1961/1962 (tax rate: 30% → 15%) | - | | | | 2.3753 (2.01)* |
| Constant | | 1.6093 (4.54)*** | 2.1582 (10.42)*** | 2.0871 (10.69)*** | 4.1247 (8.20)*** |
| R ² | | 0.00 | 0.01 | 0.18 | 0.31 |
| N | | 11 | 11 | 11 | 11 |
| Panel B: Regressions using 31 years of data (fifteen years prior to and after the tax rate change) | | | | | |
| | Expectation | 1905-1935 | 1926-1956 | 1932-1962 | 1947-1977 |
| Indicator 1919/1920 (tax rate: 0% → 10%) | + | -0.2671 (0.34) | | | |
| Indicator 1940/1941 (tax rate: 26.4% → 10%) | - | | -0.1810 (0.36) | | |
| Indicator 1946/1947 (tax rate: 15% → 30%) | + | | | -0.0053 (0.01) | |
| Indicator 1961/1962 (tax rate: 30% → 15%) | - | | | | 3.3052 (2.44)** |
| Constant | | 1.9905 (10.02)*** | 2.5111 (19.43)*** | 2.7435 (11.27)*** | 3.1948 (9.30)*** |
| R ² | | 0.00 | 0.00 | 0.00 | 0.17 |

| N | | 31 | 31 | 31 | 31 |
|---|-------------|----------------------|----------------------|----------------------|----------------------|
| <hr/> | | | | | |
| Panel C: Regressions using 41 years of data (twenty years prior to and after the tax rate change) | | | | | |
| | Expectation | 1900-1940 | 1921-1961 | 1927-1967 | 1942-1982 |
| Indicator 1919/1920 (tax rate: 0% → 10%) | + | -0.1963 (0.27) | | | |
| Indicator 1940/1941 (tax rate: 26.4% → 10%) | - | | -0.3638 (0.47) | | |
| Indicator 1946/1947 (tax rate: 15% → 30%) | + | | | -0.2907 (0.29) | |
| Indicator 1961/1962 (tax rate: 30% → 15%) | - | | | | 3.5232 (2.91)*** |
| Constant | | 1.9198 (11.87)*** | 2.6939 (15.89)*** | 3.0289 (13.46)*** | 2.9768 (11.12)*** |
| R ² | | 0.00 | 0.01 | 0.00 | 0.18 |
| N | | 41 | 41 | 41 | 41 |