

ORIGINAL ARTICLE OPEN ACCESS

# Board of Directors and Initial Public Offerings in Unregulated Financial Markets: Evidence From Belgium a Century Ago

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**Received:** 24 September 2024 | **Revised:** 14 February 2025 | **Accepted:** 24 March 2025

**Funding:** This work was supported by the Research Foundation Flanders (FWO) (Grant W0.023.19N).

**Keywords:** agency theory | Belgium | board of directors | corporate governance | initial public offerings | resource dependence theory | unregulated markets

## ABSTRACT

**Research Question/Issue:** At the turn of the 20th century, firms raised capital in a highly unregulated market characterized by severe information asymmetries and weak legal protection. In such a context, does the board of directors (BOD) play a significant role? If so, how?

**Research Findings/Insights:** We examine the relationship between the size and structure of the BOD and the market valuation and long-term performance of 668 initial public offerings (IPOs) on the Brussels Stock Exchange from 1890 to 1914. Consistent with hypotheses based on agency theory and resource dependence theory, we document an inverted U-shaped relationship between the size of the BOD and IPO valuation. Exploiting the BOD dual structure of Belgian firms, we reveal that the ratio of executive to supervisory board size influences the IPO long-term performance. Firms with a greater number of executive board members relative to supervisory board members are more likely to delist within 5 years of the IPO and exhibit lower buy-and-hold returns. The role of BOD is more pronounced for IPOs that are more likely to suffer from information asymmetry.

**Theoretical/Academic Implications:** Research on BOD has predominantly focused on contemporary and regulated contexts or on large companies. By investigating the relationship between the BOD and IPOs from a historical perspective, we document that corporate governance matters for both short-term and long-term IPO prospects in a context of unregulated financial markets, very poor investor protection, and high information asymmetry.

**Practitioner/Policy Implications:** Our results suggest that BOD is critical when investors cannot rely on regulation to cope with poor information and protection. While investors consider the size of the BOD at the time of the offering, they should also pay attention to its structure, as it strongly influences the firm's long-run performance.

## 1 | Introduction

Corporate governance has a long history. The first acknowledgments of its pivotal role date back to Adam Smith's *The Wealth of Nations*, which recognized the misalignment of interests between company managers and owners. Financial economists

have long debated about what determines corporate governance and how it affects companies' activity, emphasizing its central role in firms' productivity (e.g., Giroud and Mueller 2011), supply of capital in the financial markets (e.g., Shleifer and Vishny 1997), and ensure better long-term prospects due to the monitoring and advising functions usually exerted by

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companies' directors (e.g., Adams et al. 2010). Although the board of directors (BODs) has long been of interest to the economics (e.g., Hermalin and Weisbach 1998), finance (e.g., Boone et al. 2007; Pugliese et al. 2009), and management (e.g., Bell et al. 2014) literatures, corporate governance studies typically refer to contemporary and regulated contexts, highlighting how regulation often plays a substitute function. Historical and unregulated environments offer the opportunity to investigate the BOD without regulatory requirements, examining its function in the presence of high information asymmetries and weak legal protection.

Within the growing debate on the BOD in historical contexts (e.g., Acheson et al. 2016; Colvin et al. 2015; Deloof and Vermoesen 2016; Foreman-Peck and Hannah 2013; Hilt 2008; Lehmann-Hasemeyer and Neumayer 2022; Simpson 2009), the focus has been on large and mature firms. We extend the perspective to initial public offerings (IPOs), for which the BOD is especially important when it comes to convincing investors of the firm's value and prospects. At the IPO, the firm unveils its BOD composition to external public investors for the first time, making it more transparent than at any other stage in its history (Boone et al. 2007; Goktan and Muslu 2018). As a primary mechanism for supervising the firm and protecting minority shareholders, the BOD can serve as a signal to reassure prospective investors (e.g., Certo et al. 2001).

A particularly favorable context to investigate the BOD in an unregulated yet vibrant IPO market is Belgium a century ago, for three main reasons. First, in that period, Belgian investors faced very poor legal protection, even by the standards of the time. Financial markets' admission rules were very lax (Theate, 1905). Stockbrokers often behaved unscrupulously, and judicial authorities rarely prosecuted their financial misconducts; stock prices were typically manipulated through financial newspapers, and financial literacy was very limited among investors (Deloof and Paeleman 2024). A system of legal regulation in the Belgian financial market was introduced in 1934, and the first regulation proposal on BOD occurred in 1936, although significant regulatory changes only materialized after World War II (Deloof and Vermoesen 2016). Such uncertainty and information asymmetry were also exacerbated by the lack of modern communication technologies, difficult mobility, and the absence of international organizations, like the European Union or the United Nations today, that could have served as information networks to reduce geographic frictions. Nevertheless, Belgium had one of the most developed and international capital markets in the world (Rajan and Zingales 2003). Second, as documented by Deloof and Paeleman (2024), Belgium witnessed an impressive number of IPOs at the end of the 19th and the beginning of the 20th century. The number of Belgian common stocks listed on the Brussels Stock Exchange (BSE) increased from 180 to 616 (Annaert et al. 2015). Finally, the BOD of Belgian firms at that time had a dual structure consisting of executive directors ("administrateurs") and supervisory directors ("commissaires"), which allows us to conduct a more nuanced exploration of the BOD function, particularly of its structure.

In this article, we investigate how the size and structure of the BOD influence IPO valuation and long-term performance in

such an unregulated financial market. At that time, this was indeed the only corporate governance information available to investors for guiding their decisions (Gilis 1929). We base our predictions on the agency and resource dependence theories (e.g., Boivie et al. 2021; Hillman and Dalziel 2003). According to the agency theory, the monitoring function of the BOD is critical to addressing information asymmetries (Jensen and Meckling 1976), while the resource dependence theory assigns a fundamental role to the BOD in providing firms with valuable resources (e.g., Hillman et al. 2009). Access to resources was paramount at the turn of the 20th century, when the "First Wave of Globalization" materialized (Betrán and Huberman 2016). The unprecedented markets integration and the consequent expansion opportunities increased the firms' need for resources (Bordo et al. 2007). Accordingly, we contend that larger BODs could have played a fundamental role in mitigating information and legal deficiencies related to firms and investors in that period, thereby improving the IPO market valuation. However, too large BOD can entail coordination costs and cacophony of advices, thereby reducing the valuation of the firm (e.g., Faleye et al. 2011). Thus, we predict an inverted U-shaped relationship between BOD size and IPO valuation. Considering the critical role of monitoring exerted by supervisory board members to ensure long-term success, we expect the BOD structure to affect the IPO's long-term performance. Notably, as monitoring costs increase with the number of executive board members, we predict that IPOs with a larger number of executive relative to supervisory board members have worse long-term performance.

Our analysis relies on a unique sample of 668 IPOs listed on the BSE between 1890 and 1914. We use information on the size and structure of the BOD of each IPO-firm from the "Recueil Financier," an annual registry reporting governance and financial information of all listed companies on the BSE. For each firm, we measured the initial market valuation with the Market-to-Book (Tobin's Q as robustness) and the long-term performance with delisting probability and the 1-, 3-, and 5-year market-adjusted buy-and-hold returns. The empirical findings confirm our prediction that the BOD is critical for IPOs in unregulated financial markets. BOD size and IPO market valuation exhibit an inverted U-shaped relationship. Firms with a larger number of executive relative to supervisory board members were more likely to delist in the 5 years after the IPO and had lower 3- and 5-year market-adjusted buy-and-hold returns. The role of BOD is particularly pronounced for IPOs that are more likely to suffer from information asymmetry, such as IPOs operating outside Belgium and those listed during or after the 1900 crisis.

Our study contributes to three strands of the literature. First, it contributes to the corporate governance literature (e.g., Adams et al. 2010; Barg et al. 2024; Croci et al. 2024; Del Sordo and Zattoni 2024; Guedhami et al. 2022; Kumar and Zattoni 2013; Pugliese et al. 2015; Stathopoulos and Talaucar 2023) by investigating the BOD from a historical perspective to understand its function in unregulated financial markets. While corporate governance literature has predominantly focused on contemporary contexts (Li et al. 2020), recent studies have documented how historical analysis can help understand current governance issues (e.g., Burkart et al. 2023; Cardullo et al. 2025; Turner 2025). Our results contribute to understanding the role of corporate

governance in a global context marked by rising uncertainty (e.g., Enke and Graeber 2023), further exacerbated by recent events like military and trade conflicts. Like today, during the period we consider there was a substantial war risk that significantly affected firm outcomes (Verdickt 2020). In such a tumultuous environment, investors often deal with greater uncertainty and lower protection (e.g., Andrei et al. 2023). We document that, in such a context, the BOD plays a critical role in informing investors about IPO prospects. The historical perspective allows us to assess both short-term and long-term outcomes and to better isolate the role of the BOD from regulatory factors, which would be hardly possible by considering very recent regulated contexts alone. From a theoretical perspective, we join and contribute to recent studies combining agency theory and resource dependence theory to understand corporate governance issues (e.g., Boivie et al. 2021; Pugliese et al. 2014) by applying these theories to IPOs. With few exceptions (e.g., Bertoni et al. 2014, 2023), prior research has predominantly focused on large or small non-listed companies. We document that these two theories are powerful tools for understanding not only recent but also historical contexts.

Second, we contribute to the financial economics literature that investigates the role of corporate governance in dealing with IPOs (e.g., Becher and Frye 2011; Bertoni et al. 2014, 2023; Bruton et al. 2010; Chancharat et al. 2012; Farag et al. 2014; Khatami et al. 2023). We depart from most previous studies predominantly relying on regulated settings to document that corporate governance matters for both short-term (i.e., initial market valuation) and long-term (i.e., delisting and 3- and 5-year buy-and-hold returns) firm prospects in a context of unregulated financial markets, very poor investor protection, high information asymmetry, and lax eligibility criteria to be a corporate director.

Third, we expand the growing financial history literature on corporate governance (e.g., Acheson et al. 2016; Burhop 2009; Colvin et al. 2015; Deloof and Vermoesen 2016; Foreman-Peck and Hannah 2013; Hilt 2008; Simpson 2009; Turner 2025) and IPOs (e.g., Burhop et al. 2014; Chambers and Dimson 2009; De Jong and Legierse 2022; Deloof et al. 2023; Deloof and Paeleman 2024). Drawing on rich historical data, we contribute to a better understanding of the connection between corporate governance and IPOs at the turn of the 20th century. We extend prior research by examining the BOD outside the predominant UK context (e.g., Acheson et al. 2016; Campbell and Turner 2011; Foreman-Peck and Hannah 2012; Grossman and Imai 2016), which also allows us to consider the BOD under a dual- rather than a single-structure framework. Further, while prior historical research has considered the relationship between BOD size and firm value as linear (e.g., Campbell and Turner 2011; Foreman-Peck and Hannah 2013), we provide evidence of an inverted U-shaped effect.

The remainder of the article is structured as follows. Section 2 describes the historical and legal framework. Section 3 outlines the literature and theoretical background. Section 4 describes the data and methodology employed for the econometric analysis. Section 5 illustrates the main results. Section 6 focuses on IPOs that are potentially more exposed to information asymmetry. Section 7 concludes.

## 2 | Board of Directors and IPOs in Belgium a Century Ago

### 2.1 | Board of Directors

The legal framework for the BOD of Belgian firms before World War I was determined by the ministerial decree of February 20, 1841, and the law of May 18, 1873 (Demeur 1857, 1874; Theate, 1905; Wauwermans 1914; Deloof and Vermoesen 2016). The BOD had a dual structure with a “conseil d’administration,” which consisted of executive directors (“administrateurs”), and a “collège des commissaires,” consisting of supervisory directors (“commissaires”). A company could also set up a “conseil general,” consisting of both executive and supervisory directors (Demeur 1857, 1874). The executive directors acted on behalf of and for the account of the company. Their number and their responsibilities were determined by the company’s articles of incorporation. The executive directors were by default responsible for the companies’ operational management, and the articles of association could extend their powers to major operational and financing decisions (Wauwermans 1914; Gilis 1929). Individual directors could have specific managerial responsibilities, and non-board members could be hired to carry out specific managerial tasks. The supervisory directors had an “unlimited” right to supervise and control all operations of the firm, and they had to approve the firm annual accounts. As such, they fulfilled the role of external auditors, which did not exist in Belgium during this period.<sup>1</sup> They had access to all written documents of the company and legally acted as a college, in the interests of the shareholders (Wauwermans 1914). Their role was to inform the shareholders and each year they reported to the general shareholder meeting. Supervisory directors were not allowed to take actions themselves against the executive directors, nor to participate in the management of the company (except as members of the “conseil general”). They had the legal responsibility to the shareholders and to interested third parties for supervising the company in accordance with its statutes (Wauwermans 1914).

Firms were legally required to have at least three executive directors and one supervisory director. Directors were appointed by the general shareholder meeting for a maximum of 6 years, and their mandate was revocable. The mandate of executive directors could be renewed. The names of the directors were published in the Belgian Official Gazette, and all directors had to deposit a number of shares determined by the firm’s statutes to ascertain that directors acted in accordance with the interests of the firm (Wauwermans 1914). However, they did not have to own the deposited shares. If executive directors had a conflict of interest with respect to operations that needed to be approved by the BOD, they had to report this, and they were not allowed to participate in the decision (Demeur 1874). The executive directors could receive a salary, but they generally received “tantièmes,” i.e., a fixed percentage of the profits which was determined in the articles of association (Gilis 1929). The tantièmes of the supervisory directors was limited to a maximum of one-third of that of an executive director (Theate 1905). Surprisingly, there were no restrictions on who could be a supervisory director. According to Theate (1905), who was a law professor at the University of Brussels, these directors were often chosen among the network of the firm’s founders.

## 2.2 | IPOs

Investors in Belgium were generally very poorly protected in the period studied in this article, as reflected by the fact that none of the six investor protection measures included in the anti-director index of Djankov et al. (2008) were included in Belgian law (Deloof and Paeleman 2024). There were no mandatory procedures for security sales to the public and it was very easy to get securities listed on the BSE (Vanthemsche 1992). There was no obligation to issue a prospectus when selling securities to the public. However, a number of offerings in this period were announced with an advertisement in the *Moniteur des Intérêts matériels* (Monimat), which at the time was the most important Belgian financial journal. These advertisements were referred to as “prospectus” and contained basic information about the offering. Figure A1 illustrates an example of these prospectuses. Our own reading of 82 advertisements published in the Monimat in 1898–1899 reveals that most (but not all) of these advertisements prominently mentioned the names of the executive directors and supervisory directors. This suggests that the BOD was an important instrument for convincing investors of the firm's quality. The advertisements often also included information about the purpose of the firm and the distribution of its profits. IPO shares were typically (but not always) sold at a premium over their nominal value. The offer price was mostly fixed, but in some cases the shares were sold within an offer price range. They could be bought over a period of 1–3 days at one or more specified banks (typically one bank per city) or via mail, with some advertisements adding: “as well as with the country's leading bankers and stockbrokers.” Most advertisements included the caveat that the shares would be “allocated” if demand was greater than the number of offered shares, but they did not mention how this allocation would be done. We also did not find any mention of a procedure that could be interpreted as a greenshoe provision.

Because IPOs in this period were often subject to severe asymmetric information, they may have been underpriced. The firms going public were in most cases new ventures and/or operated abroad (Deloof and Paeleman 2024). We are not aware of any research on underpricing of Belgian IPOs in this period, but it is unlikely that IPO underpricing played a significant role. Findings on Germany (Fohlin 2010; Burhop 2011), Greece (Thomadakis et al. 2017), and the United Kingdom (Chambers and Dimson 2009) suggest that IPO underpricing was generally low in historical markets. For our setting, we were able to collect the offer price for 21 IPOs in the hot market of 1898–1900, which we compared with the first available market price. This comparison confirms the general lack of underpricing found in other countries in this period: the average (median) underpricing was minus 0.28% (1.05%), with a maximum underpricing of 14.93% and a minimum (i.e., overpricing) of minus 29.81%.

## 3 | Board of Directors, Market Valuation, and Long-Term Performance of IPOs

Corporate governance has long been of interest to the finance and management literatures, and research has devoted considerable effort to understanding the effects of BOD characteristics (e.g., Pfeffer 2019). The seminal study by Berle and

Means (1932) made popular the discussion on the separation of ownership and control. From this viewpoint, the BOD dilemma revolves around aligning the interests of directors with those of the firm's owners, the shareholders. BOD plays a fundamental role in enhancing firm productivity, and serves as an important determinant for raising capital in the financial markets (Turner 2025). As such, understanding why BODs exist has recently attracted considerable attention (Burkart et al. 2023).

BODs are at the core of two theories: the agency theory and the resource dependence theory (e.g., Daily et al. 2003; Hillman and Dalziel 2003; Shleifer and Vishny 1997). The core principle of the agency theory posits that principals (i.e., owners) delegate the administration of the company to agents (i.e., managers). To safeguard their interests, shareholders employ a combination of bonding, monitoring, and incentivization to align objective functions (Jensen and Meckling 1976). According to the agency theory, the BOD serves as the primary mechanism for conducting monitoring activities (Hermalin and Weisbach 1998). The BOD ensures that the company's management acts in the shareholders' best interests, refraining from extracting personal benefits. The monitoring role is primarily assumed to be exercised by independent directors (e.g., Afzali et al. 2024). In our case, this role would be predominantly exercised by the “commissaires.” Although independent directors might have less knowledge about the firm, their independence is crucial for monitoring management decisions. Independent directors, for instance, are found to be more prone to dismissing CEOs following bad performance (Hermalin and Weisbach 1998), promote the adoption of high-powered incentives for managers (Ryan and Wiggins 2004), reduce the company's propensity to report abnormal accruals (Klein 2002), and can increase the expected shareholder return from hostile takeovers (Byrd and Hickman 1992).

From a different perspective, the resource dependence theory suggests that the BOD acts as a bridge connecting the firm to the external environment, enabling the flow of several relevant resources. Notably, the BOD is functional in providing the firm with access to scarce resources and information (Hillman et al. 2009; Pfeffer 1972). Directors offer guidance, legitimacy, channels of communication with the external environment, and privileged access to external elements beyond the firm (Pfeffer and Salancik 1978).

Overall, both the agency and resource dependence theories suggest that larger BODs would benefit firms. Notably, in a context like Belgium at the turn of the 20th century, larger BODs could have guaranteed better investor protection, a sounder monitoring process, and reduced information asymmetries, which have a considerable impact on IPO outcomes (Boulton and Campbell 2016). Large BODs can also serve as a commitment device to investors, as the presence of multiple directors can partially restrict executive actions by increasing the cost of collusion among them (Campbell and Turner 2011).

However, BODs of excessive size can entail some disadvantages under both theories. A BOD with too many members could result in directors free-riding, potentially turning the

board into mere symbolic entities without substantial engagement (Yermack 1996). While monitoring is beneficial for the value of the firm, excessive monitoring can cause short-termism and inertia, which will eventually reduce the value of the firm (Faleye et al. 2011). Larger boards also tend to grant disproportionate control to the CEO (Eisenberg et al. 1998). The larger the BOD, the higher the agency costs, such as the cost of coordinating and motivating members to invest in monitoring activities (Wu 2004). Similarly, excessive BOD members can lead to a discordant array of advices, pose challenges in coordinating, controlling, and maintaining flexibility in decision-making processes, disperse management's focus, and diminish its decision-making capabilities (Krause and Bruton 2014).

BOD advantages (monitoring, advising, and access to resources) and disadvantages (coordination and control costs and decision-making problems) act as additive mechanisms (Haans et al. 2016). At a certain threshold, the marginal return from increasing BOD in terms of additional monitoring and advising will be less than its cost in terms of monitoring cost and information overflow.

We expect that both the BOD advantages and disadvantages will be especially pronounced in the historical environment that we are studying. The lack of legal protection and the severe information asymmetries between management, shareholders, and outside investors in pre-World War I Belgium increased the need for a BOD that reduces agency conflicts and help the firm cope with external uncertainties. However, these characteristics may also have amplified the disadvantages of large boards. The pivotal role that the BOD played in this environment is confirmed by the observation in Section 2.1 that the composition of the BOD was a central element in the communication of firms going public towards outside investors. We, therefore, predict that larger BODs in Belgium at the turn of the 20th century exerted a positive effect on IPO market valuation up to a certain threshold, after which the marginal return of an additional director decreases and becomes negative. Thus, the relationship between BOD size and IPO valuation should be non-linear (inverted

U-shaped). Further, considering that monitoring is critical to long-term success and that independent directors primarily do it, we contend that a larger number of executive (“administrateurs”) relative to supervisory (“commissaires”) board members makes monitoring more difficult, thereby shrinking the company’s long-term performance.

## 4 | Data and Methodology

### 4.1 | Sample and Data Sources

We base our study on the IPOs of Belgian firms registered on the BSE from January 1890 until the start of the World War I. We identified IPOs from the comprehensive database of the Studiecentrum voor Onderneming en Beurs (SCOB) at the University of Antwerp, which includes information on all stocks and bonds ever listed on the BSE and is based on the archives of the BSE. This is a well-established database for collecting information on Belgian firms that went public between the 19th and 20th centuries (e.g., Annaert and Verdickt 2021; Deloof and Paeleman 2024; Van Overfelt et al. 2009; Verdickt 2020). The starting year of our sample is primarily driven by the availability of the necessary information about our main variables, while the final year (1914) was the year in which the BSE was closed for 4 years because of the outbreak of the World War I.

We identify an IPO as the first time a firm lists shares on the BSE. For each of the identified IPO-firms, we use hand-collected identities and positions of the members of the BOD, as well as accounting data, from the “Recueil Financier,” a financial annual providing firm-specific information on firms listed on the BSE. From this document, investors could have access to the size and structure of the firm BOD. Figure 1 illustrates some examples of lists of BOD members as reported in the “Recueil Financier” of 1904. Of the 713 IPOs reported in the SCOB database, we could collect information on the size and structure of the BOD and financial statements for 668 IPOs, which constitute our final sample.

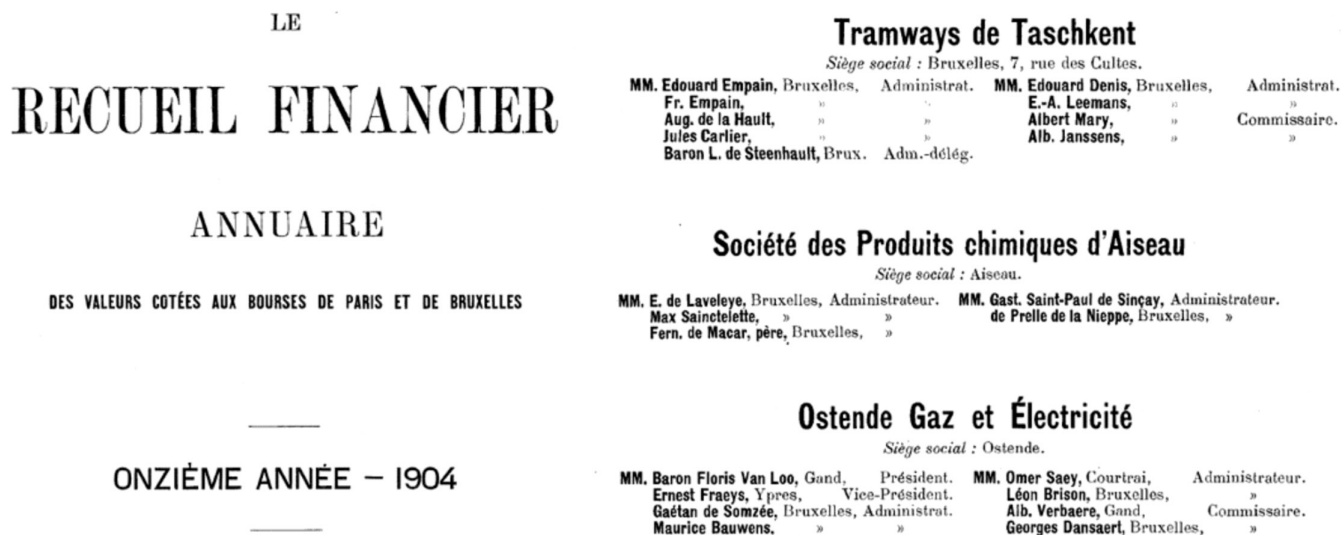


FIGURE 1 | Example of “Recueil Financier” and list of board of directors members.

## 4.2 | IPO Valuation and Long-Term Performance

The study aims to investigate the relationship of BOD size and structure with the IPO valuation and long-term performance. We assess the market valuation with the well-established *Market-to-Book*, computed as the ratio of the share's first-day closing price to the share nominal value at the time of the IPO. As a robustness, we employ a proxy of Tobin's Q. All financial information is hand-collected from the "Recueil Financier." Prior research has largely relied on these indicators to operationalize market valuation (e.g., Acheson et al. 2016; Bertoni et al. 2014; Croci et al. 2022). The benefit of using market-based valuation measures over accounting profitability measures is that they immediately incorporate the effect of corporate governance on growth expectations. Accounting profitability measures instead inherently reflect past performance. Additionally, accounting profits in Belgium were often manipulated (Van Overfelt et al. 2010). While manipulations typically concern information reported in the profit and loss account (e.g., earnings management), it is more complicated

to manipulate the balance sheet. This would anyway require a capital injection from the shareholders. Thus, we are confident that, while possible, manipulations in the measurement of the Market-to-Book are limited.

Following Deloof and Paeleman (2024), we first rely on the firm likelihood of *Delisting* in the 5 years after the IPO to examine the long-term performance. Next, we consider the 1-, 3-, and 5-year buy-and-hold market-adjusted returns (*BHAR1Y*, *BHAR3Y*, and *BHAR5Y*). Returns are measured monthly, assuming dividends received in any month to be reinvested in the stock (Ritter 1991). Specifically, market-adjusted returns are computed as the difference between the raw return and the overall stock market return over the same period. The latter is based on a value-weighted return of all Belgian stocks (Annaert et al. 2012). To ensure returns comparability across firms, we only consider firms for which the stock started trading in the IPO month. We could, therefore, compute the returns for 555 IPO-firms. All the main variables are defined in Table A1.

**TABLE 1** | Descriptive statistics.

	Mean	Median	SD	Min	Max
Market-to-Book	1.487	1.160	2.012	0.046	31.250
Delisting	0.144	0	0.351	0	1
BHAR1y	-0.074	-0.063	0.355	-1.069	2.848
BHAR3y	-0.164	-0.228	0.813	-1.440	11.152
BHAR5y	-0.248	-0.0330	0.930	-1.533	13.425
BOD size	9.325	9	3.773	2	32
Executive board size	6.332	6	2.778	1	24
Supervisory board size	2.993	3	1.505	1	11
BODs structure	2.490	2.250	1.394	0.1	14
CEO duality	0.054	0	0.226	0	1
Total assets (ml.)	6.752	3	13.391	0.390	201.094
Age at IPO	4.960	2	7.943	0	85
International distance (th. km)	3.175	2.253	3.097	0.137	16.717
Share categories	1.642	2	0.602	1	5
Leverage	0.126	0	0.185	0	0.936
Agriculture and food	0.072	0	0.258	0	1
Financials	0.109	0	0.312	0	1
Metals	0.210	0	0.407	0	1
Mining and extraction	0.139	0	0.346	0	1
Transportation	0.157	0	0.364	0	1
Utilities	0.090	0	0.286	0	1
Other industries	0.223	0	0.417	0	1
Bank affiliation	0.142	0	0.349	0	1

Note: The table reports descriptive statistics of the variables employed in the econometric analysis.  $N=668$  (555 for BHAR1y, BHAR3y, and BHAR5y).

### 4.3 | Board of Directors

To measure the BOD size and structure of each firm at the time of the IPO, we first identify the name and position of each board member as reported in the “Recueil Financier.” One issue to consider is that the “Recueil Financier” of a given year reports information from the previous year. For instance, the financial annual of 1904 provides the list of BOD members for the year 1903. Therefore, we use hand-collected BOD information for a given IPO year from the “Recueil Financier” of the following year. We first define *BOD size* as the sum of all BOD members for each firm at the time of the IPO. Next, considering the dual structure of the BOD of Belgian firms at that time, we distinguish between executive board members (“administrateurs”) and supervisory board members (“commissaires”) based on the position of each member. We construct two separate variables, *Executive board size* and *Supervisory board size*, as the sum of “administrateurs” and “commissaires” of each firm at the time of the IPO, respectively. We define *BOD structure* as the ratio of *Executive board size* to *Supervisory board size*, measuring the number of executive relative to supervisory board members.

### 4.4 | Control Variables

In line with prior research (e.g., Burhop et al. 2014; De Jong and Legierse 2022; Deloof and Paeleman 2024; Lehmann-Hasemeyer and Streb 2016), we include several control variables related to BOD, firm, and IPO characteristics. Regarding BOD characteristics, following prior literature (e.g., Bertoni et al. 2014), we include *CEO duality*, which is a binary variable equal to one if the Chairperson (i.e., “Président”) and the Chief Executive Officer (i.e., “Administrateur Délégué”) of the BOD at the time of the IPO are the same person. CEO duality can help mitigate principal-agent conflicts, but it may also lead to managerial entrenchment (Young et al. 2008).

Regarding firm characteristics, we first control for the firm size, which is critical to its valuation and performance. Notably, smaller firms typically have relatively higher valuations because of their relatively higher future growth opportunities. We measure firm size with the *Total assets* at book value at the time of the IPO. Second, we control for the *Age at IPO*, computed as the difference between the IPO year and the establishment year. Third, for each firm operating outside Belgium, we estimate its *International distance* from Belgium. In a context without modern communication technologies and difficult mobility, information asymmetry issues were particularly severe for firms operating at a great distance from Belgium. We operationalize international distance as the kilometers between the capital city of Belgium, Brussels, and the capital city of the country of operation of the focal firm. The capital cities of the Ottoman Empire and Brazil are Istanbul and Rio de Janeiro, while for all other countries, they are the current capital cities. Fourth, as a firm could list more than one share category, we compute the number of *Share categories*, which is the sum of the share categories listed by the firm. Fifth, in line with prior literature (e.g., Deloof and Paeleman 2024) and taking into account the problems with interpreting the balance sheet in this period, we include a proxy for firm *Leverage* measured as the market capitalization of bonds over market capitalizations of bonds and equity. Indeed, given the lack of regulations on the contents of either the

balance sheet or the profit and loss account, there was enormous variation in the financial reporting by Belgian listed firms in this period (Van Overfelt et al. 2010), which also makes it impossible to calculate the profitability of these firms in a reliable and consistent way. Finally, we control for firm industry. In line with Deloof and Paeleman (2024), we classify firms into seven industry categories: *Agriculture and Food*; *Financials*; *Metals* (e.g., iron, steel, and other metals); *Mining and Extraction*; *Transportation* (e.g., tramways and railways); *Utilities* (e.g., electricity, gas, and water);

TABLE 2 | BOD and IPO valuation.

Dependent variable	Market-to-Book		
	(1)	(2)	(3)
BOD size	—	0.044*	0.158***
	—	(0.023)	(0.058)
BOD size <sup>2</sup>	—	—	−0.004**
	—	—	(0.002)
BOD structure	—	0.101	0.110
	—	(0.083)	(0.084)
CEO duality	−0.001	0.047	0.041
	(0.154)	(0.167)	(0.168)
Total assets	−0.333	−0.432	−0.441
	(0.232)	(0.270)	(0.270)
Age at IPO	0.086	0.099	0.106
	(0.084)	(0.083)	(0.083)
International distance	0.077**	0.070**	0.068**
	(0.032)	(0.030)	(0.030)
Share categories	−0.073	−0.046	−0.077
	(0.146)	(0.156)	(0.157)
Leverage	−0.097	−0.041	−0.068
	(0.242)	(0.255)	(0.251)
Bank affiliation	−0.012	−0.031	−0.044
	(0.152)	(0.160)	(0.161)
Industry and Year FE	Yes	Yes	Yes
<i>Lind and Mehlum test:</i>			
Lower bound slope	—	—	0.140***
Upper bound slope	—	—	−0.123**
Overall test	—	—	$p = 0.018^{**}$
Observations	668	668	668
Log likelihood	−1390	−1388	−1386
R-squared	0.07	0.08	0.08

Note: The table reports the results of ordinary least squares models. The natural logarithm of total assets and age at IPO are considered. Robust standard errors in parenthesis. \*\*\*, \*\*, and\* denote significance at the 1%, 5%, and 10% levels, respectively.

*Other industries.* We assign each firm to a specific industry category based on the industry code defined by the SCOB.

In terms of IPO characteristics, we consider that banks played a critical role at that time (Van Overfelt et al. 2009) and that the quality of an IPO could have been certified by the reputation of an affiliated bank. Additionally, while the affiliation with a bank at the time of the IPO does not necessarily imply that the bank served as the IPO underwriter, it suggests that affiliated banks were likely involved in the IPO by selling the shares. We identify firms affiliated with banks at the time of the IPO by using interlocking directorships (e.g., Fohlin 1998; Deloof et al. 2010), retrieved from the “Recueil Financier.” The variable *Bank affiliation* is a binary variable equal to one if, at the time of the IPO, the firm has at least one board member who also serves as a board member in a bank (i.e., *Banque de Bruxelles, Banque Internationale de Bruxelles, Banque de Brabant, Banque de Charleroi, Banque de Crédit Commercial;*

*Banque de Flandre, Banque d’Outremer, Caisse d’Annuités dues par l’Etat, Crédit Général de Belgique, Crédit Général de Liégeois, Société de Crédit Communal, Société Général de Belgique*). We exclude from the banks the *Banque d’Anvers*, because it was not allowed by its statutes to be involved in underwriter business.

#### 4.5 | Empirical Model

We estimate the following model to assess the relationship between BOD and IPO market valuation and long-term performance:

$$Y = \alpha + \beta_1 \text{BOD size} + \beta_2 \text{BOD size}^2 + \beta_3 \text{BOD structure} + \gamma_1 \text{Controls} + \delta + \eta + \varepsilon \quad (1)$$

where  $Y$  is *Market-to-Book* when considering IPO valuation, and *Delisting, BHAR1Y, BHAR3Y, or BHAR5Y*, when considering IPO

**TABLE 3** | BOD and IPO long-term performance.

Dependent variable	Delisting (1)	BHAR1y (2)	BHAR3y (3)	BHAR5y (4)
BOD size	0.028 (0.079)	−0.018 (0.017)	−0.024 (0.035)	−0.023 (0.035)
BOD size <sup>2</sup>	−0.003 (0.003)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)
BOD structure	0.141*** (0.044)	−0.009 (0.014)	−0.057** (0.024)	−0.052** (0.025)
CEO duality	−0.625 (0.389)	0.060 (0.062)	0.192 (0.186)	0.298 (0.199)
Total assets	−0.085 (0.095)	0.031 (0.020)	0.074* (0.042)	0.085* (0.046)
Age at IPO	−0.322*** (0.094)	0.079*** (0.018)	0.142*** (0.043)	0.161*** (0.048)
International distance	−0.026 (0.033)	−0.008* (0.005)	−0.013 (0.011)	−0.019 (0.014)
Share categories	−0.125 (0.126)	−0.003 (0.032)	−0.096** (0.045)	−0.120** (0.050)
Leverage	−0.558 (0.463)	−0.018 (0.097)	−0.130 (0.192)	−0.178 (0.214)
Bank affiliation	−0.889*** (0.333)	0.060* (0.033)	0.002 (0.079)	0.011 (0.091)
Industry and year FE	Yes	Yes	Yes	Yes
Observations	668	555	555	555
Log likelihood	−219	−179	−644	−706
(Pseudo) R-squared	(0.20)	0.11	0.10	0.14

Note: Model (1) reports the results of Probit model, while Models (2)–(4) of ordinary least squares models. The natural logarithm of total assets and age at IPO are considered. Robust standard errors in parenthesis. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

**TABLE 4** | Two-stage least square instrumental variable analysis.

Dependent variable	First stage		Second stage				
	BOD size	BOD structure	Market-to-Book	Delisting	BHAR1y	BHAR3y	BHAR5y
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Mimicking BOD size	0.917*** (0.032)	—	—	—	—	—	—
Mimicking BOD structure	—	1.008*** (0.021)	—	—	—	—	—
BOD size	—	—	0.132** (0.063)	-0.021 (0.111)	-0.028 (0.022)	-0.053 (0.047)	-0.047 (0.047)
BOD size <sup>2</sup>	—	—	-0.004** (0.002)	-0.001 (0.005)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
BOD structure	—	—	0.125 (0.091)	0.137*** (0.050)	-0.019 (0.016)	-0.070** (0.030)	-0.067** (0.031)
CEO duality	-0.328 (0.244)	0.048 (0.138)	0.044 (0.171)	-0.627 (0.385)	0.060 (0.061)	0.196 (0.188)	0.300 (0.201)
Total assets	0.698*** (0.122)	-0.042 (0.031)	-0.404 (0.257)	-0.094 (0.097)	0.033 (0.021)	0.091** (0.044)	0.101** (0.047)
Age at IPO	0.083 (0.056)	0.035 (0.024)	0.099 (0.085)	-0.326*** (0.096)	0.078*** (0.018)	0.138*** (0.044)	0.158*** (0.049)
International distance	0.013 (0.024)	0.008 (0.007)	0.070** (0.030)	-0.024 (0.033)	-0.008 (0.005)	-0.012 (0.011)	-0.018 (0.013)
Share categories	-0.347*** (0.132)	-0.085* (0.046)	-0.080 (0.156)	-0.114 (0.129)	-0.002 (0.032)	-0.096** (0.046)	-0.122** (0.050)
Leverage	-0.641 (0.427)	0.028 (0.169)	-0.104 (0.248)	-0.539 (0.464)	-0.016 (0.098)	-0.139 (0.196)	-0.187 (0.217)
Bank affiliation	-0.176 (0.172)	0.133* (0.077)	-0.021 (0.161)	-0.877*** (0.332)	0.059* (0.033)	0.011 (0.078)	0.018 (0.090)
Industry and year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Lind and Mehlum test:</i>							
Lower bound slope	—	—	0.115**	—	—	—	—
Upper bound slope	—	—	-0.134**	—	—	—	—
Overall test	—	—	$p = 0.041$	—	—	—	—
Observations	668	668	668	668	555	555	555
Log likelihood	-1276	-617	-1385	-219	-176	-642	-705
(Pseudo) R-squared	0.81	0.81	0.08	(0.20)	0.12	0.10	0.14

Note: The table reports the results of the two-stage least square instrumental variable analysis. In Models (3)–(7) BOD size and BOD structure are instrumented with mimicking BOD size and mimicking BOD structure, respectively. The natural logarithm of total assets and age at IPO are considered. Robust standard errors in parenthesis. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

performance. All our models are estimated through ordinary least square (OLS) regressions, with the exception of the model where *Delisting* is the dependent variable, for which we estimate the Probit model through maximum likelihood. We include both linear and squared terms of *BOD size* to test the expected inverted U-shaped relationship between BOD size and IPO valuation and performance. We perform additional tests to ascertain the presence of an inverted U-shaped relationship, including the Lind and Mehlum (2010) test and semi-parametric spline linear regressions. Vector  $\bar{\gamma}_1$  includes the coefficients of the control variables. IPO industry ( $\delta$ ) year ( $\eta$ ) fixed effects ( $\eta$ ) are included.

## 5 | Results

Table 1 reports descriptive statistics of the variables included in the econometric analysis. Regarding the dependent variables, the 668 firms of our sample have, on average, a Market-to-Book equal to 1.487. A total of 14.4% of the firm delisted in the 5 years following the IPO, and the average buy-and-hold market adjusted 1-, 3-, and 5-year returns are  $-0.074$ ,  $-0.164$ , and  $-0.248$ , respectively. In terms of explanatory variables, firms have, on average, nine members in their BOD, which is in line with prior studies (e.g., Hilt 2008), six executive board members, three supervisory board members, and 2.5 executives per supervisory board member. All the BOD measures show a wide range between the minimum and maximum values, suggesting a notable variance in the BOD size and structure, which might not be available in contemporary contexts.<sup>2</sup>

Regarding the control variables, 5.4% of the firms have CEO duality. Firms have, on average, 6.752 million total assets (in Belgian Francs), do the IPO almost 5 years after the establishment, are located 3175 km from Brussels (for the firms operating abroad), list 1.642 share categories, and have a leverage of 0.126. Industry distribution is heterogeneous, with around 7% of the firms operating in agriculture and food, 11% in financials, 21% in metals, 14% in mining and extraction, 16% in transportation, 10% in utilities, and 22% in other industries. Lastly, 14.2% are affiliated with a bank at the time of the IPO. Table A2 reports the correlation coefficients among the variables included in the econometric analysis.

### 5.1 | Board of Directors and IPO Valuation

Table 2 reports the results of Equation (1) when considering the Market-to-Book as the dependent variable. Model (1) is the baseline specification including only the control variables only and year fixed effects. To assess the effect of BOD, we first add the linear term of *BOD Size* and *BOD Structure* in Model (2). Next, we include the *BOD size*<sup>2</sup> to test the predicted inverted U-shaped relationship in Model (3). The linear term of *BOD size* is positive and statistically significant ( $p$ -value  $< 0.01$ ), whereas *BOD Size*<sup>2</sup> is negative and statistically significant ( $p$ -value  $< 0.05$ ). These findings suggest that, consistent with our prediction, the relationship between BOD size and the IPO market valuation is inverted U-shaped.

However, while necessary, a negative and statistically significant quadratic term is not sufficient alone to ascertain the existence of an inverted U-shaped curve because it does not allow for reasonably rejecting the hypothesis that the true relationship is

**TABLE 5** | BOD and IPO valuation—executive and supervisory boards.

Dependent variable	Market-to-Book	
	(1)	(2)
Executive board size	0.177** (0.075)	—
Executive board size <sup>2</sup>	−0.007** (0.003)	—
Supervisory board size	—	0.353** (0.152)
Supervisory board size <sup>2</sup>	—	−0.020 (0.012)
BOD structure	0.065 (0.078)	0.233** (0.115)
CEO duality	0.055 (0.167)	0.023 (0.168)
Total assets	−0.404 (0.266)	−0.480* (0.265)
Age at IPO	0.107 (0.082)	0.097 (0.085)
International distance	0.069** (0.030)	0.069** (0.030)
Share categories	−0.075 (0.157)	−0.058 (0.152)
Leverage	−0.102 (0.244)	−0.012 (0.262)
Bank affiliation	−0.039 (0.159)	−0.044 (0.162)
Industry and year FE	Yes	Yes
<i>Lind and Mehlum test:</i>		
Lower bound slope	0.162***	0.313***
Upper bound slope	−0.165**	−0.087
Overall test	$p = 0.019$	$p = 0.290$
Observations	668	668
Log likelihood	−1389	−1386
R-squared	0.08	0.08

Note: The table reports the results of ordinary least squares models. Natural logarithm of total assets and age at IPO are considered. Robust standard errors in parenthesis. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

monotone (Haans et al. 2016). Hence, we perform the Lind and Mehlum (2010) test to corroborate the evidence of a quadratic relationship. The test identifies the curve turning point, that is the optimal BOD size, at 17 members, which is well located within

its range of variation. The curve slopes at the lower and upper bound are statistically significant and of the expected sign, positive for the lower and negative for the upper bound, and the overall test for the presence of the inverted U-shaped is statistically significant ( $p$ -value = 0.018). Conversely, the coefficient of *BOD structure* is not statistically significant, suggesting that BOD size rather than the BOD structure matters for IPO market valuation.

Among the control variables of the firm characteristics, the positive and statistically significant coefficient of *International Distance* ( $p < 0.05$ ) shows that IPO market valuation increases with the distance between Brussels and the capital city of the

country of operation of the focal firm. It seems that international firms were expected to have better growth and expansion prospects than domestic firms, although the findings of Deloof and Paeleman (2024) suggest that the IPOs of international firms tended to be overvalued.

## 5.2 | Board of Directors and IPO Long-Term Performance

We now examine the relationship between BOD and the long-term performance of IPO-firms. Table 3 reports the results of

**TABLE 6** | BOD and IPO long-term performance—executive and supervisory boards.

Dependent variable	Delisting		BHAR1y		BHAR3y		BHAR5y	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Executive board size	-0.051 (0.084)	—	-0.038 (0.026)	—	-0.033 (0.043)	—	-0.031 (0.042)	—
Executive board size <sup>2</sup>	-0.000 (0.004)	—	0.001 (0.001)	—	0.001 (0.002)	—	0.001 (0.002)	—
Supervisory board size	—	0.074 (0.168)	—	-0.140* (0.085)	—	-0.131 (0.117)	—	-0.102 (0.113)
Supervisory board size <sup>2</sup>	—	-0.017 (0.017)	—	0.016 (0.011)	—	0.012 (0.012)	—	0.008 (0.011)
BOD structure	0.165*** (0.045)	0.130** (0.066)	-0.001 (0.012)	-0.034 (0.025)	-0.045** (0.020)	-0.090* (0.046)	-0.041* (0.021)	-0.080* (0.046)
CEO duality	-0.635* (0.385)	-0.598 (0.390)	0.057 (0.061)	0.070 (0.061)	0.189 (0.187)	0.201 (0.186)	0.295 (0.199)	0.305 (0.199)
Total assets	-0.097 (0.092)	-0.119 (0.095)	0.033 (0.021)	0.025 (0.022)	0.071* (0.040)	0.073 (0.045)	0.081* (0.043)	0.083* (0.049)
Age at IPO	-0.329*** (0.095)	-0.318*** (0.095)	0.077*** (0.019)	0.078*** (0.018)	0.140*** (0.043)	0.143*** (0.043)	0.160*** (0.049)	0.163*** (0.048)
International distance	-0.023 (0.033)	-0.027 (0.032)	-0.008 (0.005)	-0.008* (0.005)	-0.013 (0.011)	-0.014 (0.011)	-0.019 (0.014)	-0.020 (0.014)
Share categories	-0.109 (0.124)	-0.114 (0.123)	-0.002 (0.032)	0.001 (0.031)	-0.097** (0.045)	-0.092** (0.045)	-0.120** (0.050)	-0.117** (0.049)
Leverage	-0.518 (0.461)	-0.525 (0.459)	-0.015 (0.098)	-0.026 (0.097)	-0.127 (0.193)	-0.137 (0.189)	-0.174 (0.215)	-0.182 (0.210)
Bank affiliation	-0.868*** (0.332)	-0.914*** (0.335)	0.065** (0.033)	0.062* (0.033)	0.003 (0.079)	0.002 (0.080)	0.011 (0.091)	0.010 (0.092)
Industry and year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	668	668	555	555	555	555	555	555
Log likelihood	-219	-219	-177	-173	-644	-643	-706	-706
(Pseudo) R-squared	(0.20)	(0.20)	0.12	0.13	0.10	0.10	0.14	0.14

Note: Models (1) and (2) reports the results of Probit model, while Models (3)–(8) of ordinary least squares models. The natural logarithm of total assets and age at IPO are considered. Robust standard errors in parenthesis. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

TABLE 7 | International and domestic IPOs.

Dependent variable	International IPOs					Domestic IPOs				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
BODs size	Market-to-Book 0.270** (0.127)	Delisting -0.114 (0.130)	BHAR1y -0.043 (0.035)	BHAR3y -0.072 (0.078)	BHAR5y -0.074 (0.075)	Market-to-Book 0.037 (0.046)	Delisting 0.042 (0.105)	BHAR1y 0.015 (0.016)	BHAR3y 0.040 (0.032)	BHAR5y 0.053 (0.036)
BODs size (sq.)	-0.007* (0.004)	0.002 (0.005)	0.001 (0.001)	0.001 (0.002)	0.002 (0.002)	-0.001 (0.001)	-0.004 (0.004)	-0.000 (0.001)	-0.001 (0.001)	-0.002 (0.001)
BODs structure	0.172 (0.139)	0.177*** (0.058)	-0.027 (0.019)	-0.063* (0.033)	-0.050 (0.030)	0.005 (0.045)	0.131* (0.076)	0.029 (0.022)	-0.050 (0.036)	-0.042 (0.042)
CEO duality	-0.098 (0.562)	0.253 (0.470)	-0.013 (0.080)	-0.141 (0.116)	-0.066 (0.157)	0.102 (0.145)	0.000 (0.000)	0.152 (0.110)	0.537 (0.340)	0.645* (0.350)
Total assets	-0.761 (0.483)	-0.038 (0.165)	0.058* (0.030)	0.173*** (0.054)	0.201*** (0.064)	-0.159 (0.135)	-0.125 (0.142)	0.016 (0.030)	-0.042 (0.076)	-0.023 (0.090)
Age at IPO	0.056 (0.177)	-0.369** (0.176)	0.085** (0.036)	0.175*** (0.063)	0.204*** (0.061)	0.127* (0.068)	-0.335*** (0.123)	0.089*** (0.022)	0.127** (0.060)	0.143** (0.070)
Share categories	-0.137 (0.321)	-0.325 (0.222)	0.035 (0.046)	-0.057 (0.064)	-0.083 (0.063)	0.005 (0.103)	-0.048 (0.164)	-0.054 (0.040)	-0.111 (0.083)	-0.152 (0.099)
Leverage	0.283 (0.588)	-1.196 (0.804)	-0.135 (0.137)	-0.237 (0.208)	-0.162 (0.208)	-0.363 (0.267)	0.036 (0.553)	0.130 (0.157)	-0.052 (0.333)	-0.273 (0.384)
FE affiliation	-0.267 (0.303)	-0.882* (0.505)	0.072 (0.051)	0.077 (0.116)	0.031 (0.123)	0.210 (0.215)	-0.930** (0.413)	0.085* (0.045)	-0.054 (0.096)	-0.004 (0.127)
Industry and year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Lind and Mehlum test:</i>										
Lower bound slope	0.243**	—	—	—	—	0.033	—	—	—	—
Upper bound slope	-0.163	—	—	—	—	-0.027	—	—	—	—
Overall test	$p=0.125$	—	—	—	—	$p=0.245$	—	—	—	—
Observations	311	311	271	271	271	357	357	284	284	284

(Continues)

TABLE 7 | (Continued)

Dependent variable	International IPOs					Domestic IPOs				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Market-to-Book	-731	-84	-89	-254	-247	-470	-126	-59	-348	-395
Log likelihood		(0.31)	0.19	0.23	0.35	0.09	(0.17)	0.21	0.16	0.16
(Pseudo) R-squared										

Note: Models (1)–(5) are estimated on the subsample of international (i.e., operating outside Belgium) IPOs, while Models (6)–(10) of domestic (i.e., operating in Belgium) IPOs. Models (1), (3)–(5), (6), and (8)–(10) report the results of ordinary least squares models, while Models (2) and (7) of Probit models. Natural logarithm of total assets and age at IPO are considered. Robust standard errors in parenthesis. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

Equation (1) when considering *Delisting* (i.e., a binary variable equal to one if the firm delists in the 5 years after the IPO) (Model 1), *BHAR1Y* (i.e., 1-year market-adjusted buy-and-hold returns) (Model 2), *BHAR3Y* (i.e., 3-year market-adjusted buy-and-hold returns) (Model 3), and *BHAR5Y* (i.e., 5-year market-adjusted buy-and-hold returns) (Model 4) as the dependent variables. The Probit Model (1) of Table 3 shows that neither the linear nor the quadratic term of *BOD size* are statistically significant, suggesting the BOD size does not affect the likelihood of delisting. Conversely, the structure of the BOD matters for delisting. The positive and statistically significant ( $p$ -value < 0.01) coefficient of *BOD structure* (i.e., the ratio of the number of executive board members to the number of supervisory board members) indicates that firms with a larger number of executive relative to supervisory board members were more likely to delist in the 5 years after the IPO. OLS Model (2) of Table 3 shows no effect of BOD on *BHAR1y*, while OLS Models (3) and (4) document that firms with a higher executive-to-supervisory board members ratio experienced lower *BHAR3Y* and *BHAR5Y*.

Overall, Table 3 reveals that BOD structure, rather than BOD size, matters for the long-term performance of the IPO firms. Specifically, firms with larger executive relative to supervisory board members have worse long-term prospects, as they are more likely to delist and have lower *BHAR3Y* and *BHAR5Y*. These findings are consistent with the agency theory, stating that monitoring is critical to success. As monitoring is usually done by supervisory board members, the monitoring costs and challenges faced by supervisory board members should increase with the number of executive board members. More executive board members to supervise entails a dilution of monitoring, which is detrimental to long-term performance. Regarding the control variables, older firms at IPO are less likely to delist and have higher returns. Firms that list more share categories have lower *BHAR3Y* and *BHAR5Y*, and those affiliated with a bank at the time of the IPO are less likely to delist.

### 5.3 | Addressing Endogeneity

Endogeneity concerns often arise in studies on corporate governance due to the potentially endogenous nature of BOD (Hermalin and Weisbach 1998). In our study, our analyses may suffer from endogeneity due to omitted variables, because IPO valuation and IPO performance may be due to unobservable qualities of a firm, also affecting BOD size and BOD structure. These unobservable qualities may also result in simultaneously determining good performance and improved governance. To address these concerns, we conduct an instrumental variable (IV) analysis, because IV provides a way to isolate the variation in the explanatory variable that is uncorrelated with the omitted variables. Following an approach similar to Bertoni et al. (2014), we instrument BOD size and structure with mimicking behavior variables (i.e., *Mimicking BOD size* and *Mimicking BOD structure*), which are defined as the average BOD size and structure of all the firms belonging to the same industry, and with the same age at IPO and travel distance from Belgium, listed in the BSE in the IPO year. Firms often mimic other firms with similar characteristics to gain

social legitimacy (Deephouse 1996), and mimicking behavior is particularly relevant for IPOs (Bell et al. 2012). This particularly applies to our study context, where IPO-firms could mimic other listed firms in terms of BOD size and structure. While mimicking behavior is correlated with the IPO-firm BOD size and structure, aligning with the relevance criterion, it is not directly related to its valuation and performance, aligning with the exclusion restriction criterion.

Table 4 presents the results of the two-stage least square IV analysis. Models (1) and (2) report the results of the first stage, showing that the IVs have a positive and statistically significant effect on BOD size and BOD structure. Models (3)–(7) report the results of the second stage, using measures of IPO valuation and long-term performance as dependent variables and instrumenting BOD size and BOD structure with the mimicking variables. The results confirm the inverted U-shaped relationship between BOD size and IPO valuation and the negative effect of a larger executive to supervisory board members on IPO long-term performance.

### 5.4 | The Board of Directors Dual Structure: Distinguishing Between Executive and Supervisory Board Members

The information on BOD collected from the “Recueil Financier” allows us to compute not only the size of the BOD as a whole but also the size of the executive and supervisory boards. In the common belief of the period, the executive board members (i.e., the “administrateurs”) played a much more important role than the supervisory board members (i.e., the “commissaires”) (Theate, 1905), which is reflected by the fact that the maximum tantième for supervisory directors was legally capped at one-third of the tantième for executive directors. Given the different reputations of executive and supervisory board members towards individuals and investors, the size of the executive and supervisory boards could affect the IPO market valuation differently. Accordingly, we disentangle

the BOD size into its two components and develop the following OLS model:

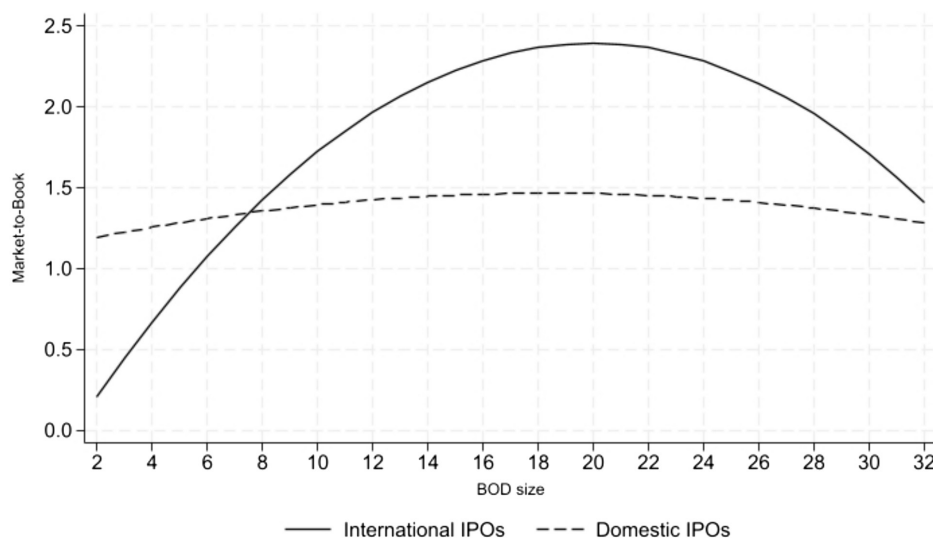
$$Y = \alpha + \beta_1 \text{Executive (Supervisory) board size} + \beta_2 \text{Executive (Supervisory) board size}^2 + \beta_3 \text{BOD structure} + \gamma_1 \text{Controls} + \delta + \eta + \varepsilon \quad (2)$$

Table 5 reports the results of Equation (2). Model (1) of Table 5 confirms the inverted U-shaped relationship between *Executive board size* and IPO market valuation and the non-statistically significant effect of BOD structure. Model (2), which considers *Supervisory board size*, provides weaker evidence of an inverted U-shaped curve. This might be due to the smaller variability and size of the supervisory board compared with the executive board. The BOD structure is positive and statistically significant in Model (2) of Table 5 ( $p$ -value  $< 0.05$ ), suggesting that a larger number of executive relative to supervisory board members is positively associated with IPO market valuation. When the most variable component of the BOD (i.e., the executive board) is excluded, its effect is likely to be incorporated by the BOD structure.

Table 6 reports the results of Equation (2) when considering the IPO long-term performance measures as the dependent variables. Overall, Table 6 confirms our main findings. The BOD size does not affect IPO long-term performance, even when disentangling the BOD in its two components. Conversely, the BOD structure affects IPO long-term performance. Firms with a larger number of executive relative to supervisory board members tend to have worse long-term prospects in terms of delisting and market returns.

### 5.5 | Robustness Tests

We develop three alternative models to test the robustness of the inverted U-shaped relationship between BOD and IPO market valuation. First, we employ a proxy of Tobin's Q as an alternative



**FIGURE 2** | BOD size and IPO valuation—international and domestic IPOs. *Notes:* The figure plots the predicted values of Market-to-Book at the values of BOD size observed in our sample, distinguishing between international (solid line) and domestic (dash line) IPOs.

TABLE 8 | IPOs listed before and during or after the 1900 crisis.

Dependent variable	IPOs listed during or after the 1900 crisis					IPOs listed before the 1900 crisis				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Market-to-Book	Delisting	BHAR1y	BHAR3y	BHAR5y	Market-to-Book	Delisting	BHAR1y	BHAR3y	BHAR5y
BODs size	0.203** (0.082)	-0.048 (0.093)	-0.018 (0.024)	-0.035 (0.051)	-0.006 (0.051)	0.068 (0.083)	0.148 (0.130)	-0.010 (0.022)	0.001 (0.035)	-0.039 (0.038)
BODs size (sq.)	-0.005** (0.002)	-0.000 (0.003)	0.000 (0.001)	0.001 (0.001)	0.000 (0.002)	-0.002 (0.003)	-0.009 (0.006)	0.000 (0.001)	-0.000 (0.001)	0.001 (0.001)
BODs structure	0.204* (0.121)	0.145** (0.057)	-0.013 (0.016)	-0.068* (0.036)	-0.076** (0.038)	0.008 (0.074)	0.124* (0.065)	-0.004 (0.027)	-0.044* (0.026)	-0.025 (0.027)
CEO duality	0.045 (0.300)	0.000 (0.000)	0.119 (0.095)	0.143 (0.160)	0.366* (0.204)	-0.082 (0.259)	-0.294 (0.449)	0.003 (0.085)	0.121 (0.274)	0.120 (0.275)
Total assets	-0.863** (0.416)	0.075 (0.120)	0.050* (0.028)	0.103* (0.058)	0.107* (0.060)	0.042 (0.268)	-0.189 (0.138)	0.012 (0.030)	0.040 (0.064)	0.066 (0.071)
Age at IPO	0.078* (0.046)	0.018 (0.041)	-0.008 (0.006)	-0.028 (0.018)	-0.037* (0.022)	0.039** (0.018)	-0.072 (0.050)	-0.008 (0.010)	0.003 (0.016)	0.007 (0.016)
International distance	0.025 (0.149)	-0.246** (0.109)	0.069*** (0.025)	0.100 (0.076)	0.104 (0.089)	0.119 (0.096)	-0.398*** (0.150)	0.113*** (0.032)	0.210*** (0.072)	0.233*** (0.073)
Share categories	0.145 (0.232)	-0.256 (0.172)	-0.054 (0.034)	-0.117** (0.054)	-0.166** (0.066)	-0.236 (0.219)	-0.001 (0.174)	0.068 (0.058)	-0.049 (0.085)	-0.054 (0.086)
Leverage	0.047 (0.366)	-0.229 (0.617)	-0.146 (0.135)	-0.655** (0.327)	-0.734* (0.377)	-0.437 (0.305)	-0.690 (0.660)	0.133 (0.144)	0.381* (0.228)	0.338 (0.228)
FE affiliation	0.232 (0.264)	0.000 (0.000)	0.012 (0.043)	-0.103 (0.083)	-0.096 (0.112)	-0.181 (0.152)	-1.017** (0.449)	0.102* (0.054)	0.124 (0.138)	0.149 (0.140)
Industry and year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Lind and Mehlum test:</i>										
Lower bound slope	0.182***	—	—	—	—	0.061	—	—	—	—

(Continues)

TABLE 8 | (Continued)

Dependent variable	IPOs listed during or after the 1990 crisis					IPOs listed before the 1990 crisis				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Market-to-Book	Delisting	BHAR1y	BHAR3y	BHAR5y	Market-to-Book	Delisting	BHAR1y	BHAR3y	BHAR5y
Upper bound slope	-0.122*	—	—	—	—	-0.056	—	—	—	—
Overall test	$p = 0.072$	—	—	—	—	$p = 0.306$	—	—	—	—
Observations	377	377	312	312	312	291	291	243	243	243
Log likelihood	-812	-103	-89	-389	-435	-542	-120	-82	-237	-240
(Pseudo) $R$ -squared	0.15	(0.13)	0.13	0.10	0.11	0.07	(0.19)	0.13	0.14	0.24

Note: Models (1)–(5) are estimated on the subsample of IPOs listed during or after the 1990 crisis, while Models (6)–(10) of IPOs listed before 1990. Models (1), (3)–(5), (6), and (8)–(10) report the results of ordinary least squares models, while Models (2) and (7) of Probit models. Natural logarithm of total assets and age at IPO are considered. Robust standard errors in parenthesis. \*\*\*, \*\*, \*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

valuation measure, computed as the ratio of the market value of assets to the book value of assets. The market value of assets is computed as the sum of the market value of outstanding shares and the market value of outstanding bonds. Model (1) of Table A3 confirms the presence of an inverted U-shaped relationship between BOD size and IPO valuation. Second, we winsorize Market-to-Book at the 1% and 99% levels to ascertain that the results are not driven by extreme values. Model (2) of Table A3 reports the results when using winsorized Market-to-Book, confirming our main findings. The main differences with Table 2 are the statistically significant coefficients of *Total assets* and *Age at IPO*. Third, in Model (3) of Table A3, we use semi-parametric spline regressions. Specifically, we compute two separate parameters for BOD size below and above its median. As expected, the slope is positive and statistically significant ( $p$ -value  $< 0.05$ ) in the part of the curve below the median BOD size and negative and statistically significant in the part of the curve above the median BOD size ( $p$ -value  $< 0.05$ ).

We conduct two robustness tests for the relationship between BOD and the IPO-firm long-term performance. First, in our main analysis, variable *Delisting* includes all delisted firms in the 5 years after the IPO, regardless of the reason for delisting. However, prior literature has highlighted that delisting may occur for reasons that are not necessarily indicative of poor performance, such as a merger or an acquisition (e.g., Macey et al. 2008; Wennberg and DeTienne 2014). Thus, for each firm of our sample that delisted in the 5 years after the IPO, we identified the reason for delisting from the “Recueil Financier.” We distinguish firms that delisted for reasons that are indicative of poor performance (e.g., bankruptcy, insolvency, liquidation, dissolution) from those that delisted for reasons that are not necessarily indicative of poor performance (e.g., merger, acquisition, restructuring). Of the 96 firms that delisted in the 5 years after the IPO, 55 delisted for reasons that are indicative of poor performance and 41 for reasons that are not necessarily indicative of poor performance. We conduct a robustness analysis by excluding firms in the second group from the definition of *Delisting*. Model (1) of Table A4 confirms that a larger number of executive relative to supervisory board members increases the likelihood of delisting.

Second, IPO long-term performance can be influenced by seasoned offerings, which refer to the issuance of additional shares following the IPO. Thus, we collect data on the monthly number of shares listed by each firm of our sample and their nominal value. We proxy seasoned offerings by looking at increases in the number of listed shares after the IPO. To avoid including stock splits (i.e., increases in the number of shares due to a decrease in the share nominal value, which means no new capital is raised), we only consider increases in the number of listed shares whose nominal value does not decrease. Given the time period of our performance variables (i.e., 1, 3, and 5 years), we define the three following variables: *SO1y* is a binary variable equal to one if the firm has seasoned offerings (i.e., increases the number of listed shares) in the first year after IPO; *SO3y* is a binary variable equal to one if the firm has seasoned offerings in 3 years after the IPO; and *SO5y* is a binary variable equal to one if the firm has seasoned offerings in 5 years after the IPO and zero otherwise. We conduct a robustness analysis by controlling for seasoned offerings in the regression models where long-term performance measures are the dependent variables. The results reported in Models (2)–(5)

of Table A4 show that seasoned offerings reduce the likelihood of delisting and increase BHAR3y and BHAR5y. The effect of BOD structure on the likelihood of delisting, BHAR3y, and BHAR5y is confirmed.

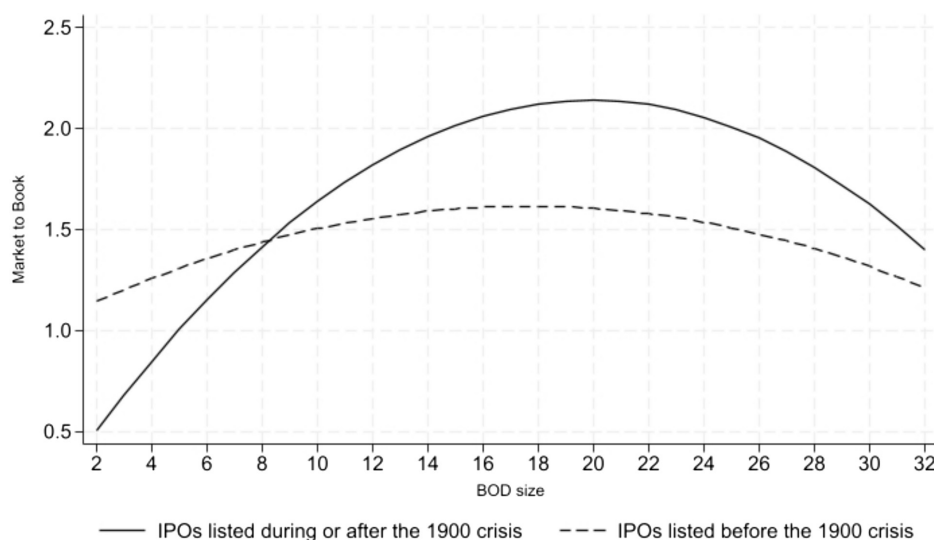
## 6 | IPOs More Exposed to Information Asymmetry

We examine whether the effects of BOD size and structure are more pronounced for IPOs that are more likely to suffer from information asymmetry during the sample period. We identify these IPOs in two ways. First, we distinguish between domestic (i.e., operating in Belgium) and international (i.e., operating outside Belgium) IPOs. Our sample includes a remarkable portion of international IPOs (47%). For these IPOs, information asymmetry is particularly severe due to the greater distances from Belgium and the absence of modern communication technologies. This issue is further intensified by the liability of foreignness that international IPOs face due to limited familiarity with the local market and insufficient access to information networks (Paeleman et al. 2017). Thus, we predict that the role of BOD is more pronounced for international IPOs. Second, Belgium experienced an economic crisis in 1900, which led to a sharp decline in stock prices on the BSE (Deloof and Paeleman 2024). This crisis, which was the first major stock market decline experienced by many Belgian investors, increased uncertainty, exacerbating information asymmetry and potentially increasing awareness among investors of the importance of the BOD for IPOs listed during or after the crisis. We distinguish between IPOs listed before and during or after the 1900 crisis, predicting that the role of BOD is more pronounced for the latter.

Following an approach similar to Bertoni et al. (2023), we estimate Equation (1) on split samples to identify whether the role of BOD is more pronounced for IPOs that are more likely to be exposed to information asymmetry (i.e., international IPOs and IPOs listed during or after the 1900 crisis).

In Table 7, we study the relationship between BOD and IPO valuation and performance distinguishing between international and domestic IPOs. The coefficients of the linear and quadratic terms of BOD size on Market-to-Book are statistically significant for international IPOs, as reported in Model (1) of Table 7, while they are of the expected sign but not statistically significant for domestic IPOs, as reported in Model (6) of Table 7. Thus, the role of BOD size is more pronounced in international IPOs compared with domestic IPOs. This is confirmed by Figure 2, showing a more pronounced inverted U-shaped relationship between BOD size and Market-to-Book for international compared with domestic IPOs. Models (2)–(5) and (7)–(10) of Table 7 indicate that the role of BOD structure is also more pronounced for international IPOs, particularly for the likelihood of delisting and BHAR3y. Taken together, Table 7 and Figure 2 show that BOD size and structure matter particularly for international IPOs, supporting our prediction that BOD has a stronger role for IPOs that are more exposed to information asymmetry.

In Table 8, we study the relationship between BOD and IPO valuation and performance distinguishing between IPOs listed during or after the 1900 crisis and those listed before. The coefficients of the linear and quadratic term of BOD size on Market-to-Book are statistically significant for IPOs listed during or after the 1900 crisis, as reported in Model (1) of Table 8, while they are of the expected sign but not statistically significant for IPOs listed before the 1900 crisis, as reported in Model (6) of Table 8. Figure 3 confirms the more pronounced inverted U-shaped relationship between BOD size and Market-to-Book for IPOs listed during or after the 1900 crisis compared with those listed before, indicating that BOD size plays a stronger role for IPOs listed after the onset of the crisis, during a period of heightened uncertainty. Models (2)–(5) and (7)–(10) of Table 8 indicate that the role of BOD structure is also more pronounced for IPOs listed during or after the crisis. Overall, Tables 7 and 8 and Figures 2 and 3 provide evidence that BOD plays a more pronounced role for IPOs that are more exposed to information



**FIGURE 3** | BOD size and IPO valuation—IPOs listed before and after the 1900 crisis. *Notes:* The figure plots the predicted values of Market-to-Book at the values of BOD size observed in our sample, distinguishing between IPOs listed during or after (solid line) and before (dash line) the 1900 crisis.

asymmetry, such as international IPOs and IPOs listed during or after the 1900 crisis.

## 7 | Conclusion

In this study, we investigate the relationship between the BOD and the market valuation and long-term performance of IPOs in a highly unregulated financial market like Belgium at the turn of the 20th century. At that time, Belgium had one of the most developed and international capital markets, yet characterized by lax regulation, high information asymmetry, and very poor legal protection. We collected information on the BOD and other relevant characteristics of 668 Belgian IPO-firm between 1890 and 1914. Our findings document that BOD played a critical role in shaping IPO market valuation and long-term performance in such an unregulated financial market.

Consistent with the agency and resource dependence theories, we predict and document an inverted U-shaped relationship between BOD size and IPO valuation, as gauged by the Market-to-Book ratio. This relationship is primarily driven by the number of executive board members (“administrateurs”), who had a better reputation than supervisory board members (“commissaires”) in the common belief of the time. While the BOD structure does not affect short-term market valuation, it emerges as critical to long-term performance. IPOs with a larger number of executive relative to supervisory board members are more likely to delist in the 5 years after the IPO and have lower 3- and 5-year buy-and-hold returns. The role of BOD is more pronounced for IPOs that are more likely to suffer from information asymmetry.

Our findings first contribute to the corporate governance literature by introducing a historical perspective on BOD and showing that BOD is critical when investors cannot rely on regulation to cope with poor information and protection. Secondly, our study expands the finance literature by documenting the active role of corporate governance in an environment characterized by lax regulations and weak investor protection. We document that, in a globalized yet unregulated market, the BOD serves as a fundamental factor in shaping IPO market valuation and long-term prospects. Finally, we expand the financial history literature by investigating the under-researched relationship between corporate governance and IPOs over the turn of the 19th and 20th centuries, when an extraordinary integration of commodity, labor, and capital markets materialized (Bordo et al. 2007). We provide evidence that BOD played a relevant role for IPOs in such a context and extend prior literature that found a linear and positive connection between BOD size and market valuation (e.g., Campbell and Turner 2011; Foreman-Peck and Hannah 2013). We document that the relationship is actually inverted U-shaped for IPO firms. Large BODs are beneficial for valuation, but too large BODs can be detrimental due to agency costs. We reveal the importance of considering both the short- and long-term dimensions. While BOD size affects the initial market

valuation, the BOD structure emerges as critical to long-term success.

## Acknowledgments

We are grateful to Frans Buelens for his help with collecting and interpreting the data used in this paper. We also thank Konstantinos Stathopoulos (the Editor), two anonymous reviewers, Sibylle Lehmann-Hasemeyer, Ine Paeleman, Laura Toschi, John Turner, and participants at the Finance & History Workshop at Euronext Brussels and the 35th AiIG Conference in Palermo for their valuable comments and suggestions. We thankfully acknowledge financial support provided by the Research Foundation Flanders (FWO) (Grant W0.023.19N). Open access publishing facilitated by Università degli Studi di Bergamo, as part of the Wiley - CRUI-CARE agreement.

## Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

## Endnotes

- <sup>1</sup> According to Wauwermans (1914, 256): “The real domain of the commissaires is the accounting ... In England, their work is done by chartered accountants.”
- <sup>2</sup> According to the Belgian legal framework of the time, firms were required to have at least three executive directors and one supervisory director. Thus, the minimum BOD size should be 4. However, only six firms in our sample have a BOD size lower than this threshold.

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## COMPAGNIE GÉNÉRALE de TRACTION ÉLECTRIQUE sur les VOIES NAVIGABLES

(SOCIÉTÉ ANONYME)

### CAPITAL : 1,500,000 FRANCS

Divisé en 15,000 actions d'une valeur nominale de 100 francs.  
Il a en outre été créé 15,000 actions de dividende sans désignation de valeur.

**Siège social : BRUXELLES**

Constituée par acte passé le 24 novembre 1898 devant M<sup>e</sup> ECTORS, notaire à Bruxelles, et publié au *Moniteur Belge* le 4 décembre 1898.

**Conseil d'administration :**

MM. le baron Floris VAN LOO, propriétaire à Gand, président ;  
Arthur DE POTTER, avocat, vice-président de la Société anonyme du Canal et des Installations maritimes de Bruxelles, vice-président ;  
Alfred VERBAERE, avocat à Gand, administrateur ;  
Ambroise DENEFLÉ, entrepreneur à Paris, administrateur ;  
Léon GÉRARD, ingénieur-électricien à Bruxelles, administrateur-délégué.

**Collège des commissaires :**

MM. le baron Maurice de PEELLAERT, ancien officier d'artillerie, à Gand ;  
Georges DANSAERT, commissaire du Crédit foncier de Belgique.

### VENTE PAR SOUSCRIPTION PUBLIQUE

DE  
**2,500 Actions de capital au prix de 130 francs**

PAYABLES	à la souscription.	50 francs.
	à la répartition.	80 francs.

**Contre délivrance du titre définitif.**

*La souscription sera ouverte le 10 Janvier 1899, de 10 heures du matin à 4 heures de relevée.*

Chez Messieurs **E. STALLAERTS et ALFRED LOEWENSTEIN,**  
Agents de change  
**47, Boulevard de la Senne, à BRUXELLES.**

Ainsi que chez les principaux banquiers et agents de change du pays et de l'étranger  
On peut souscrire dès à présent par correspondance.  
Si les demandes dépassent le nombre de titres offerts en souscription, il y aura lieu à répartition.

**L'admission de la Cote Officielle de la Bourse de Bruxelles sera demandée.**

### NOTICE.

Aux termes des statuts de la Compagnie générale de traction électrique sur les voies navigables, la société a pour objet l'industrie de la traction et de la propulsion des bateaux sur les voies navigables en tous pays et par tous procédés quelconques, notamment par les procédés mécaniques ou électriques.

La traction électrique sur les voies navigables apporte au trafic des canaux les progrès que la traction électrique sur rails a apportés à l'industrie des tramways, c'est-à-dire un accroissement de trafic par la vitesse, par la régularité et par le bon marché.

L'expérience a clairement démontré, par le succès considérable et par le développement de l'industrie des tramways électriques, combien l'électricité se prête avec facilité à ce genre de transport de force.

Il en est de même pour les canaux, avec cette circonstance favorable que les lignes électriques à construire traversent des centres industriels, des petites villes et villages dans lesquels il y a possibilité de vendre l'énergie électrique pour la lumière et la force motrice.

L'exploitation des lignes électriques établies le long des canaux représente donc pour ceux qui auront pris les devants dans cette industrie un avenir très brillant.

Les systèmes de traction électrique pour le halage des bateaux comprennent plusieurs modes d'application dont la société belge possède les divers brevets et les licences exclusives pour la Belgique, la Hollande, les colonies et le Congo.

Les procédés électriques sont expérimentés en France depuis 1893. Ils sont en exploitation depuis un an sur l'un des canaux les plus importants du Nord de la France (canal d'Alre et de la Deule). Cette seule installation des 20 premiers kilomètres fait des recettes moyennes de 500 fr. par jour. La construction du prolongement de cette ligne est en cours pour une longueur de 80 kilomètres.

Les recettes moyennes des canaux belges exploités électriquement sont de 5,000 fr. par kilomètre ; il en est qui atteignent 8,000 à 10,000 fr. par kilomètre, avec des moyens de traction dont la vitesse varie de 1,500 à 2,500 mètres à l'heure.

L'électricité permet d'atteindre des vitesses de 2,500 à 6,000 mètres et ces vitesses ne sont limitées que par des considérations de conservation des berges.

D'autre part, les frais bruts d'exploitation varient avec l'électricité de 2,000 à 3,000 francs par kilomètre, suivant le tonnage des bateaux et les conditions de formation des trains de bateaux.

Il y a donc lieu de prévoir que, comme pour les tramways, l'emploi de l'électricité augmentera le trafic des canaux, trafic qui est limité actuellement par la lenteur et par le prix élevé de la traction par chevaux.

D'une manière générale, l'emploi de l'électricité apporte une économie de 20 p. c. sur la traction animale, avec un accroissement de vitesse de 30 p. c.

D'autre part, on constate, de même que pour l'industrie des tramways, que l'industrie du halage et du remorquage présente une stabilité particulière de recettes, avec un accroissement progressif et régulier.

En 1888 le trafic des canaux belges était de 677,722,000 tonnes kilométriques ; en 1890 il atteignit 804,837,000 tonnes kilométriques, soit un accroissement de près de 18-20 p. c. en huit années.

Ce trafic représente une recette totale, au prix moyen de 5/10 de centime par

tonne kilométrique, de 4,000,000 de francs pour la navigation sur les canaux par bateaux d'intérieur seuls.

Les chiffres correspondants sont presque de 30 p. c. supérieurs pour la Hollande.

L'industrie de la traction électrique sur les voies navigables de ces deux pays constitue donc une des plus fructueuses applications de l'électricité aux moyens de transport.

La Compagnie générale s'est assurée, dès ses débuts, l'usage des procédés les plus perfectionnés et dont une exploitation régulière d'une année en France a consacré l'excellence.

Dès sa constitution la société a été mise à même d'entrer immédiatement en action.

M. A. Deneffé, qui a cédé ses droits pour la Belgique et la Hollande à la société belge, a été déclaré adjudicataire du halage monopolisé pour 47 kilomètres du canal de Charleroi à Bruxelles à partir du 1<sup>er</sup> janvier 1899. Les recettes actuelles de cette petite traction du champ d'opération de la Compagnie générale de traction électrique s'élevaient à 200,000 francs par an. L'exploitation électrique commencera dans le courant de l'été de cette année ; provisoirement le halage se continue par chevaux, au bénéfice de la compagnie.

La compagnie est en instance pour la construction de plus de deux cents kilomètres de voies navigables.

Comme on l'a vu plus haut, si l'on s'en tenait aux renseignements statistiques officiels de 1896, et en négligeant l'accroissement normal annuel du trafic, on peut, au minimum, prévoir que l'application de l'électricité sur la moitié seulement des canaux en Belgique seule apportera plus de 50 p. c. de l'import total des recettes, soit la moitié de 4,000,000 de francs par an, à l'industrie de la traction électrique, même en ne tenant aucun compte des augmentations certaines du trafic et du fait que la traction s'établira sur les canaux à fortes recettes. Le rendement probable de cette partie du réseau serait d'environ 3,000,000 de francs au moins et récomenserait largement le capital nécessaire à l'ensemble de ces entreprises, impliquant l'immobilisation de 12 millions environ.

En effet, ces recettes étant de 3,000,000 de francs (ce qui correspond à une estimation de recettes très réduite de 3,750 francs par kilomètre) et les dépenses d'exploitation de 2,000,000 de francs environ, le bénéfice serait de 1 million de francs.

Ce calcul, établi sur les bases les plus modérées, ne s'applique qu'au réseau belge. Il y a lieu de signaler que le développement de cette industrie en Hollande permet de prévoir un chiffre d'affaires de 30 p. c. plus considérable.

On conçoit donc que la Compagnie générale formée actuellement en Belgique a un champ d'opérations considérable et que son avenir est assuré, parce qu'elle est destinée, comme les premières sociétés générales de tramways formées dans notre pays, à servir d'organisme central, créant, au fur et à mesure du développement de son industrie, des sociétés filiales dont le rendement est certain dès maintenant et qui bénéficieront dans l'avenir de tous les progrès et perfectionnements acquis aux procédés de traction électrique.

Un placement en actions de la Compagnie générale de traction électrique semble donc pouvoir être considéré comme l'un des plus sûrs et des plus rémunérateurs. (766)

FIGURE A1 | An example of prospectus published in the "Moniteur des Intérêts matériels".

TABLE A1 | Variable definitions.

Variable	Definition
Panel A. Dependent variables	
IPO market valuation	
Market-to-Book	Ratio of the share first-day closing price to the share nominal value.
IPO long-term performance	
Delisting	Binary variable equal to one if the firm delisted in 5 years after the IPO and zero otherwise.
BHAR1y	Market-adjusted buy-and-hold returns (1 year).
BHAR3y	Market-adjusted buy-and-hold returns (3 years).
BHAR5Y	Market-adjusted buy-and-hold returns (5 years).
Panel B. Explanatory variables	
BOD size	Number of the board of director members at the time of the IPO.
Executive board size	Number of executive board members at the time of the IPO.
Supervisory board size	Number of supervisory board members at the time of the IPO.
BOD structure	Ratio of the number of executive to the number of supervisory board members at the time of the IPO.
Panel C. Control variables	
CEO duality	Binary variable equal to one if the firm has CEO duality and zero otherwise. CEO duality is defined when the Chairperson (i.e., <i>Président</i> ) and the Chief Executive Officer (i.e., <i>Administrateur Délégué</i> ) of the BOD at the time of the IPO are the same person.
Total assets	Total assets at book value at the time of the IPO.
Age at IPO	Years elapsed from the firm establishment to the IPO year.
International distance	Distance expressed in kilometers from Brussels to the capital city of the country of operation of the firm.
Share categories	Number of share categories listed by the firm at the time of the IPO.
Leverage	Market capitalization of bonds over market capitalizations of bonds and equity.

(Continues)

TABLE A1 | (Continued)

Variable	Definition
Industry	Agriculture and foods, financial, metals, mining and extraction, transportation, utilities, and other industries.
Bank affiliation	Binary variable equal to 1 if the firm has an affiliation with a bank and 0 otherwise. A firm is defined as affiliated with a bank if it has a bank director in its board at the time of IPO.

**TABLE A2** | Correlation matrix.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) Market-to-Book	1.000											
(2) Delisting	-0.020*	1.000										
(3) BHAR1y	-0.039*	-0.181*	1.000									
(4) BHAR3y	-0.037*	-0.216*	0.483*	1.000								
(5) BHAR5y	-0.019*	-0.196*	0.416*	0.919*	1.000							
(6) BOD size	0.013*	-0.082*	-0.047*	-0.020*	-0.013*	1.000						
(7) Executive board size	0.020*	-0.054*	-0.071*	-0.044*	-0.032*	0.939*	1.000					
(8) Supervisory board size	-0.003*	-0.106*	0.014*	0.032*	0.029*	0.773*	0.508*	1.000				
(9) BOD structure	0.055*	0.098*	-0.026*	-0.081*	-0.066*	-0.026*	0.255*	-0.535*	1.000			
(10) CEO duality	-0.020*	-0.060*	0.042*	0.035*	0.049*	-0.029*	-0.062*	0.041*	-0.078*	1.000		
(11) Total assets	-0.013*	-0.069*	0.017*	0.012*	0.014*	0.457*	0.457*	0.303*	0.198*	-0.026*	1.000	
(12) Age at IPO	0.066*	-0.120*	0.181*	0.142*	0.162*	-0.137*	-0.163*	-0.044*	-0.066*	-0.032*	-0.081*	1.000
(13) International distance	0.075*	-0.054*	-0.048*	-0.035*	-0.043*	0.261*	0.268*	0.159*	0.063*	-0.044*	0.245*	-0.105*
(14) Share categories	-0.037*	-0.005*	-0.026*	-0.057*	-0.057*	0.154*	0.135*	0.136*	-0.003*	0.032*	0.193*	-0.146*
(15) Leverage	-0.078*	-0.023*	-0.070*	-0.048*	-0.066*	0.098*	0.107*	0.048*	0.055*	0.049*	0.198*	-0.279*
(16) Agriculture and food	0.041*	0.035*	0.039*	-0.011*	-0.014*	0.013*	0.008*	0.017*	0.009*	-0.015*	0.021*	0.001*
(17) Financials	0.081*	0.007*	-0.046*	0.065*	0.057*	0.198*	0.188*	0.149*	-0.004*	-0.084*	0.114*	-0.005*
(18) Metals	0.026*	0.083*	-0.016*	-0.019*	-0.036*	-0.018*	-0.042*	0.032*	-0.068*	0.056*	-0.062*	-0.075*
(19) Mining and extraction	0.004*	-0.017*	0.012*	0.014*	0.007*	-0.092*	-0.087*	-0.070*	0.009*	-0.019*	-0.051*	0.040*
(20) Transportation	-0.051*	-0.060*	-0.017*	-0.011*	-0.011*	0.012*	0.036*	-0.036*	0.042*	-0.012*	0.151*	-0.041*
(21) Utilities	-0.045*	-0.039*	-0.019*	0.008*	0.012*	0.081*	0.106*	0.009*	0.067*	-0.029*	0.031*	0.021*
(22) Other industries	-0.040*	-0.014*	0.043*	-0.033*	-0.004*	-0.128*	-0.137*	-0.069*	-0.026*	0.063*	-0.149*	0.064*
(23) Bank affiliation	-0.019*	-0.142*	0.050*	0.013*	0.015*	0.201*	0.192*	0.150*	-0.017*	0.017*	0.182*	0.060*

(Continues)

TABLE A2 | (Continued)

Variables	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)
(1) Market-to-Book											
(2) Delisting											
(3) BHAR1y											
(4) BHAR3y											
(5) BHAR5y											
(6) BOD size											
(7) Executive board size											
(8) Supervisory board size											
(9) BOD structure											
(10) CEO duality											
(11) Total assets											
(12) Age at IPO											
(13) International distance	1.000										
(14) Share categories	0.147*	1.000									
(15) Leverage	0.016*	-0.039*	1.000								
(16) Agriculture and food	0.191*	0.050*	-0.074*	1.000							
(17) Financials	0.153*	0.097*	-0.016*	-0.097*	1.000						
(18) Metals	-0.177*	-0.091*	0.039*	-0.143*	-0.180*	1.000					
(19) Mining and extraction	-0.058*	-0.127*	-0.062*	-0.112*	-0.141*	-0.207*	1.000				
(20) Transportation	0.082*	0.100*	0.173*	-0.120*	-0.151*	-0.222*	-0.174*	1.000			
(21) Utilities	-0.041*	0.039*	0.113*	-0.087*	-0.110*	-0.162*	-0.126*	-0.136*	1.000		
(22) Other industries	-0.055*	-0.022*	-0.158*	-0.149*	-0.188*	-0.276*	-0.215*	-0.231*	-0.168*	1.000	
(23) Bank affiliation	0.129*	0.021*	0.013*	0.036*	0.036*	-0.146*	0.010*	0.130*	0.052*	-0.064*	1.000

Note: The table reports correlation coefficients among the variables employed in the econometric analysis. \* denotes  $p < 0.01$ .

**TABLE A3** | BOD and IPO valuation—robustness tests.

Dependent variable	Tobin's Q	Market-to-Book (w.)	Market-to-Book
	(1)	(2)	(3)
BOD size	0.125** (0.052)	0.100*** (0.039)	— —
BOD size <sup>2</sup>	-0.003** (0.002)	-0.003** (0.001)	— —
BOD (below median)	— —	— —	0.120** (0.048)
BOD (above median)	— —	— —	-0.109** (0.049)
BOD structure	0.101 (0.076)	0.062 (0.045)	0.109 (0.084)
CEO duality	0.141 (0.146)	0.067 (0.118)	0.040 (0.165)
Total assets	-0.560** (0.244)	-0.245* (0.128)	-0.420 (0.266)
Age at IPO	0.063 (0.075)	0.113** (0.050)	0.105 (0.083)
International distance	0.057** (0.028)	0.043** (0.019)	0.068** (0.030)
Share categories	0.023 (0.123)	-0.103 (0.091)	-0.073 (0.153)
Leverage	-0.184 (0.224)	-0.248 (0.175)	-0.065 (0.252)
Bank affiliation	0.014 (0.124)	0.020 (0.131)	-0.037 (0.159)
Industry and year FE	Yes	Yes	Yes
<i>Lind and Mehlum test:</i>			
Lower bound slope	0.112***	0.089***	—
Upper bound slope	-0.073*	-0.081**	—
Overall test	$p = 0.070^*$	$p = 0.018^{**}$	—
Observations	668	668	668
Log likelihood	-1290	-1017	-1386
R-squared	0.12	0.10	0.08

Note: Models (1) and (2) report the results of ordinary least squares models, while Model (3) of semi-parametric spline models. Spline parameters for board size are computed below and above its median. Tobin's Q is defined as the ratio of the market value of assets to the book value of assets. The natural logarithm of total assets and age at IPO are considered. Robust standard errors in parenthesis. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

**TABLE A4** | BOD and long-term performance—robustness analyses.

<b>Dependent variable</b>	<b>Delisting (1)</b>	<b>Delisting (2)</b>	<b>BHAR1Y (3)</b>	<b>BHAR3Y (4)</b>	<b>BHAR5Y (5)</b>
BOD size	−0.007 (0.087)	0.022 (0.083)	−0.017 (0.017)	−0.025 (0.035)	−0.025 (0.035)
BOD size <sup>2</sup>	−0.001 (0.003)	−0.003 (0.003)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)
BOD structure	0.147*** (0.049)	0.142*** (0.044)	−0.010 (0.014)	−0.057** (0.024)	−0.055** (0.025)
CEO duality	−0.297 (0.393)	−0.630 (0.389)	0.058 (0.060)	0.193 (0.182)	0.240 (0.190)
Total assets	−0.243** (0.110)	−0.063 (0.094)	0.030 (0.020)	0.076* (0.043)	0.078* (0.046)
Age at IPO	−0.351*** (0.110)	−0.284*** (0.092)	0.079*** (0.018)	0.137*** (0.043)	0.151*** (0.050)
International distance	−0.012 (0.038)	−0.008 (0.031)	−0.009* (0.005)	−0.016 (0.011)	−0.026* (0.015)
Share categories	0.273** (0.123)	−0.029 (0.134)	−0.006 (0.033)	−0.112** (0.045)	−0.150*** (0.050)
Leverage	0.959* (0.495)	−0.207 (0.462)	−0.019 (0.097)	−0.193 (0.189)	−0.318 (0.255)
Bank affiliation	−0.821* (0.422)	−0.883** (0.358)	0.057* (0.033)	−0.004 (0.080)	0.036 (0.090)
SO1y	— —	— —	0.059 (0.059)	— —	— —
SO3y	— —	— —	— —	0.171** (0.082)	— —
SO5y	— —	−1.042*** (0.241)	— —	— —	0.336** (0.167)
Industry and year FE	Yes	Yes	Yes	Yes	Yes
Observations	668	668	555	555	555
Log likelihood	−149	−206	−178	−642	−700
(Pseudo) <i>R</i> -squared	(0.22)	(0.25)	0.12	0.10	0.16

Note: Models (1) and (2) report the results of Probit models, while Models (2)–(4) of ordinary least squares models. In Model (1), variable *Delisting* excludes firms that delisted following a merger, an acquisition, or restructuring. The natural logarithm of total assets and age at IPO are considered. Robust standard errors in parenthesis. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.