Board Structure in Emerging Markets: A Simultaneous Equation Modeling

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Board Structure in Emerging Markets: A Simultaneous Equation Modeling[*]

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Abstract: This paper unravels the board structure of 42,146 firms in China and 21 European emerging markets and empirically examines its determinants. Structural estimation of simultaneous equation models that endogenize board size, outside board chairmanship, and board independence produced evidence supporting our predictions about potential factors that determine these three variables, which are based on previous studies of developed economies. However, we found striking differences in the combination of factors that strongly affect board structure between China and European emerging markets and between public and private companies. Furthermore, the empirical results in this paper suggest that the close interdependence among board components requires analytical consideration.

JEL classification numbers: D22; G32; G34; K22; L22; P34

Keywords: board structure, emerging market firms, simultaneous equation modeling, China, Eastern Europe

1 Introduction

As the presence of China and former socialist European emerging markets in the global economy grows daily, the interest in corporations operating in these economies also grows. With an increasing number of emerging market firms joining the world's top-ranked companies in terms of market capitalization, we are witnessing a complete shift from the 1990s, when Unites States (US), European, and Japanese firms virtually dominated the world market.[1] The international community is confronted with the formation of a new economic order created by the rise of emerging market firms.

The greater the firm's international presence, as with Japanese firms in the 1980s, the greater the interest of investors and researchers in its management organization. The internal organization of emerging corporations intrigues investors who want to find whether these firms are trustworthy enough to invest their own money in. It also inspires researchers to explore whether these firms are catching up with those that previously dominated the market or undergoing genuine organizational evolution. These aspects have, in fact, been the focus of research on the internal organization of Japanese companies, yielding a wealth of knowledge and making significant contributions to both business and academia (Dore, 1973; Aoki, 1988; Asanuma, 1997; Roberts, 2004).

Companies in China and Eastern Europe's emerging markets are currently attracting the most attention from investors and researchers. The core of these companies were formerly socialist state enterprises founded during the planned system's era; thus, their internal organization was vastly different from that of capitalist enterprises. These state-run enterprises, monitored and supervised by the planning authorities, lacked even the most fundamental corporate body, the board of directors, and an autonomous corporate governance structure. However, the implementation of China's reform and open-door policy, as well as the disintegration of the socialist bloc in Eastern Europe, transformed the corporate landscape (Turley and Luke, 2010; Åslund, 2013; Lin et al., 2020). In the decades since, Chinese and Eastern European companies have had to drastically change their internal organizational structures to adapt to the new business environment. In many ways, these emerging market firms may have imitated the management organization of firms in advanced economies. However, it is also highly likely that they have evolved their own organization, influenced by the national character of emerging markets and the

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[1] According to *Forbes* magazine, in 2021, 39 of the world's top 100 firms by market capitalization were US firms, whereas 17 and 2 were Chinese and Russian firms, respectively. Only 20 firms from the other six G7 countries were listed in this ranking (https://www.forbes.com/lists/global2000).

planned system's historical path dependency (the so-called "socialist legacy"). Therefore, the survey and empirical analysis of emerging market firmsshould produce results that cannot be obtained from either advanced or developing economies, as well as new issues and theoretical hints for organizational economics and corporate finance. Furthermore, as will be discussed later, the nature of the systemic transformation process differs significantly between China, which maintains a one-party communist dictatorship at the core of its political system, and eastern European countries, which have been promoting marketization and democratization simultaneously. Indeed, studying how differences in transition processes are reflected in firms' internal organization will advance the study of emerging markets and comparative economics.

Using a large sample of public and private companies, we explore the board structure of firms in China and 21 European emerging markets, and we empirically examine its determinants.[2] We make the following contributions to the literature by achieving the study's objectives.

The reasons for emerging market firms' recent exceptional success are largely unknown because academic research on emerging market firms is still in its early stages. Although the board of directors is the "first milestone" for researchers of internal corporate organization, only a few studies published in international journals investigate the organizational structure of corporate boards in emerging markets and its determinants. The same can be said of Chinese companies, which have long attracted international attention (Yu and Ashton, 2015; Cheng et al., 2018; Wang, 2018; Liu et al., 2021; Wang et al., 2021). Furthermore, most studies of Chinese firms have focused on large corporations listed on the Shanghai and Shenzhen stock exchanges, with little attention paid to over-the-counter (OTC) companies and other nonlisted firms, which outnumber listed firms significantly. Studies on European emerging market firms are even more limited, with only a few researchers ever publishing findings on Russian and Czech firms (Iwasaki, 2008, 2018; Muravyev, 2017; Odehnalová and Pirožek, 2018). To fill such an academic void, this article boldly enters the research field of internal organization of emerging market firms by focusing on the board structure of companies in China and European emerging markets, and presenting a quantitative analysis of board structure determinants. We seek to identify factors that have an economically meaningful and

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[2] This paper defines a public company (or publicly traded company) as a firm whose ownership is organized via shares of stock that are freely traded on a stock exchange or over-the-counter market. We define a private company (or privately held company) as a company whose shares are offered, owned, traded, and exchanged privately.

statistically significant impact on the board structure of emerging market firms by conducting a comprehensive review of theoretical considerations and empirical findings from previous studies that primarily focused on firms in developed economies.

Furthermore, we use an advanced empirical approach and econometric techniques to specify the determinants of board structure to provide facts and empirical evidence that previous research work had never revealed. Following Arthur (2001) and Iwasaki (2008, 2009), we first categorize factors that may influence board structure into "governance variables," which are narrowly defined to capture the state of a firm's internal organization, and "business-activity variables," which reflect business activities and financial performance. We further categorize governance variables into two subcategories: "bargaining variables," proxies for managers' and interested parties' bargaining power in conflict with top management, and "other governance variables," which cover other aspects of internal firm organization. The impact of these three variable groups on corporate board structure in emerging markets is then compared across four types of firms: (a) Chinese public companies, (b) European emerging market public companies (hereafter referred to as European public companies), (c) Chinese private companies, and (d) European emerging market private companies (hereafter referred to as European private companies).

To assess the effects of the three variable groups mentioned above on the board structure of emerging market firms, we focus on the issue raised by Mak and Li (2001) and Linck et al. (2008) concerning the simultaneous formation of board components. More specifically, we estimate a model for each group of firms that assumes the endogeneity of the total number of board members (board size), the frequency with which the board chairman is elected from outside the firm (outside board chairmanship), and the proportion of outside/independent directors to all board members (board independence). To that end, we perform a regression analysis. The first stage involves a reduced-form estimation of single-equation models using each of the three board structure variables as the dependent variable. In the second stage, structural estimation of simultaneous equation models is performed, in which independent variables estimated to be statistically significant in the first stage and endogenized board structure variables are introduced on the right-hand side of the equation. This econometric approach is regarded as one of the best empirical strategies in this field of research, where the true model cannot be specified theoretically.

Large firm-level data covering 42,146 firms in China and 21 European emerging markets were used for the structural estimation of simultaneous equation models that

endogenized board size, outside board chairmanship, and board independence. This resulted in evidence to support our predictions, which are based on previous studies of developed economies on potential factors influencing these three variables. Alternatively, we found significant differences in the combination of factors that strongly affect board structure between China and European emerging markets, and between public and private companies. Our empirical results also highlight the importance of analytically considering the close interdependence of the aforementioned board structure variables. This type of research is unprecedented and contributes to studies of corporate finance and emerging markets.

The rest of the paper is structured as follows: The following section examines the institutional foundations of corporate boards in China and European emerging markets. Section 3 presents a set of hypotheses about the factors that influence board structure in emerging markets. Section 4 discusses the data and methodology used to test hypotheses. Section 5 provides a statistical overview of board composition in China and European emerging markets. Section 6 reports the estimation results. Section 7 summarizes the main findings and brings the article to a close.

2 Institutional Frameworks of Corporate Legislation, Corporate Forms, and Board Structure in China and European Emerging Markets

Section 2.1 outlines the institutional frameworks of corporate legislation, major corporate forms, and board structure for China, whereas Section 2.2 outlines the institutional frameworks for European emerging markets.

2.1 China

The Company Law of the People's Republic of China (hereinafter referred to as the PRC Company Law), the Partnership Business Law, and the Law on Individual Proprietorship Enterprises form the foundation of modern Chinese corporate law.[3] Business firms that can be established in China are broadly classified into three types: (a) individually owned

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[3] The PRC Company Law was enacted on December 29, 1993, at the 5th meeting of the Standing Committee of the 8th National People's Congress. It was subsequently revised in 1999, 2005, 2013, and 2018 before it assumed its current form. The Partnership Business Law was enacted on February 23, 1997, at the 24th meeting of the Standing Committee of the 8th National People's Congress and was subsequently revised in 1997, 2006, and 2009. The Law on Individual Proprietorship Enterprises is the most recent law enacted by the Standing Committee of the 9th National People's Congress at its 11th meeting, held on August 30, 1999, and came into effect on January 1, 2000.

enterprises, (b) partnerships, and (c) corporations. Limited liability companies (LLCs) and joint-stock companies (JSCs) are examples of corporations. The board of directors as a corporate governance system is relevant for LLCs and JSCs, and most Chinese medium- and large-sized companies use one of these corporate forms.

The shareholders' committee, the firm's highest decision-making body, has authority over the appointment and dismissal of LLC directors, according to the PRC Company Law (Art. 37), and the number of directors appointed at the shareholder meeting is between 3 and 13 (Art. 44). Similarly, the law requires that JSC directors be elected and dismissed at a general meeting of shareholders (Art. 105), and that the board of directors comprises 5 to 19 members (Art. 108). The directors' terms of office are limited to 3 years per term and are subject to the provisions of the incorporation articles (Arts. 46 and 108). LLCs and JSCs can name one chairman and one or two vice chairs to their boards. While LLCs can specify how the board chairman and vice chairman are to be elected in their articles of incorporation (Art. 44), JSCs are required to have their board chairman and vice chairman elected by a majority of board members (Art. 109).

The board of directors is authorized to: convene shareholders' meetings/general meetings of shareholders and report on business operations; execute shareholder meetings/general meetings of shareholders; decide on management plans and investment plans; prepare budget proposals and resolutions; prepare profit distribution plans and deficit compensation plans; prepare plans to increase or reduce registered capital and issue bonds; prepare plans for the merger, division, dissolution, or change of the corporate form; establish internal control mechanisms; decide on the appointment, dismissal, and remuneration of the general manager, deputy general manager, and other financial managers; decide on the basic management system of the firm; and exercise other powers provided for in the articles of incorporation (Arts. 47 and 109). Although the voting procedures of the board of directors of LLCs may be specified in the articles of incorporation (Art. 49), a resolution of the board of directors of JSCs must be approved by most directors (Art. 112). These legal provisions for directors, chairpersons of boards of directors, and boards of directors apply equally to public and private companies.

The PRC Company Law also includes several special provisions concerning the organizational structure of listed companies (Section 5). In fact, Article 123 of the law requires listed companies to appoint independent directors in accordance with the State Council's regulations (i.e., the central government). In fact, there are several official

regulations concerning independent directors of listed firms.[4] Here, we will focus on the most important document, known as "the Guidance Opinions on the Establishment of Independent Directorship System of Listed Companies" (hereafter referred to as the "Guidance"), which the Securities and Exchange Commission issued on August 16, 2001. According to the Guidance, domestic listed firms must amend their articles of incorporation and appoint a certain number of independent directors, at least one of whom must be an accounting expert.[5] It also recommends that independent directors account for at least one-third of all board members. Independent directors may not serve on the boards of more than five firms. Like all other directors, independent directors serve three-year terms and are eligible for reappointment. Furthermore, the Guidance states that an independent director may not be removed without cause before the end of their term of office, unless circumstances have arisen that make him or her unsuitable for appointment as a director under the PRC Company Law.

China's listing markets are divided into four categories based on strict listing criteria, in descending order: first-board market, second-board market, third-board market, and fourth-board market. The first-board market, also known as the "main board," and the second-board market, also known as the "founding board," are stock exchanges that the People's Bank of China directly controls. Floor-to-floor stock exchanges (OTC markets) under direct control of local governments manage the third- and fourth-board markets. In 2020, 4,154 companies were listed on stock exchanges, while the third-board market alone had 8,187 OTC companies (China Securities Regulatory Commission, 2020; Saito, 2021). Companies listed on the third- and fourth-board markets and those going public on the first- and second-board markets must have a sound organization in terms of corporate governance and business model—as one listing criterion.[6] In addition,

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[4] These regulations include the "Guidelines for Corporate Governance of Listed Companies" promulgated by the Shanghai Stock Exchange in November 2000 and "the Code of Corporate Governance for Listed Companies" promulgated by the China Securities Regulatory Commission and the State Economic and Trade Commission on January 7, 2002. These regulations neither contradict nor differ significantly from the Guidance Opinions of the China Securities Regulatory Commission.

[5] In the Guidance Opinion, an *independent director* is defined as "a director who does not hold any other positions in the firm besides that of director and who does not have any relationship with the listed firm that invited him or her, nor with the firm's major shareholders, that could influence their independent and objective judgment."

[6] In fact, to register a listing on the third-board market, the following five conditions must be met: (a) The company must be a joint-stock company established by law and in existence for at least 2 years; (b) the company has clear business operations and the ability to sustain management;

according to the assessments of Chinese legal experts and other specialists, the above-mentioned special provisions for listed firms in the PRC Company Law are interpreted to apply also to third- and fourth-board companies listed over the counter on the Shenzhen, Shanghai, and Beijing stock exchanges. [7] Therefore, the aforementioned official regulations aimed at listed firms also impact the board structure of these OTC companies.

Another noteworthy aspect of Chinese firms' governance systems is that the Communist Party of China (CPC) mediated ties between the state and firms. Although the internal CPC organization is not a corporate body as defined by the PRC Company Law, it does play a role in management decision-making and supervision (Jiang, 2020; Ma and Iwasaki, 2021; Wang and Wang, 2022). In fact, the PRC Company Law states that "The activities of the communist party grassroots organization (primary-level party organization, hereinafter 'grassroots party organization') within a firm shall be carried out following the CPC Constitution. The firm shall provide the necessary conditions for the grassroots party organization to carry out their activities" (Art. 19). Furthermore, the CPC Constitution states that "in state-owned firms, the grassroots party organization shall take a leadership position, provide opinions and proposals on important issues, and participate in decision-making," and that "in nonstate-owned firms, the grassroots party organization shall thoroughly enforce the CPC's policies and guide and supervise firms' compliance with national laws" (Art. 33). Simply put, the state has a significant influence on the corporate organization of both state-owned and private firms in China, primarily through grassroots party organization within the firm, and has a particularly large say in the board structure of state-owned firms. This point will be raised again when discussing institutional framework differences with European emerging market countries.

2.2 European emerging markets

More than 30 years after the fall of the Berlin Wall in 1989, European emerging markets, previously under socialist regimes, are now widely recognized worldwide as countries operating based on the capitalist market economy with modern corporate laws comparable to those of developed economies. These countries have developed labor, securities, and other related legislation to supplement their corporate laws. The *Principles*

(c) the company has a sound corporate governance system, and its operation is set forth in written rules; (d) the rights of shareholders are clear, and the share issuance and transfer of shares do not violate any laws or regulations; and (e) the company has been recommended by the sponsoring securities firm and is subject to sustained supervision and guidance (http://star.sse.com.cn/).

[7] For instance, see the following Chinese websites: https://zhuanlan.zhihu.com/p/373595314; https://www.csai.cn/wenda/1005608.html; and https://www.csai.cn/stock/1386656.html.

of Corporate Governance, published by the Organization for Economic Cooperation and Development (OECD, 1999), which is an international benchmark for sound corporate governance, are strictly embodied in the corporate governance codes widely introduced and practiced in the region as soft law.

The situation in European emerging markets is similar to that in China in that (a) LLCs and JSCs are the most common corporate forms in European emerging market countries, (b) corporate laws have basic provisions on how to elect members and chairmen of the board of directors and on the authority of the board's members, and (c) government regulations for public companies aim to ensure that boards of directors are formed with a certain degree of independence.[8] Hence, rather than listing the legal provisions governing corporate forms and boards of directors in European emerging markets, we will concentrate on the institutional characteristics of these countries that contrast sharply with those of China in this subsection.

First, European culture and law have significantly impacted corporate systems and business activities in European emerging markets. Most European emerging markets have followed the legal systems of Germany and the Netherlands in constructing the institutional organization of their firms, which is typically characterized by a two-tier corporate governance system. Estonian public firms, for example, are modeled after German law. However, the composition of the supervisory board is not determined jointly by shareholders and employees, but rather by a unique discretionary model (Vutt and Vutt, 2017). Russia's corporate law is also based on German law, but it also shares some characteristics with the Anglo-American corporate legal system (Iwasaki, 2003, 2018; Oda, 2012). This type of a so-called "hybrid corporate" is also found in Belarus (Cerha Hempel, 2020).

Second, companies established and operating in Central and Eastern European (CEE) countries that have joined or are candidates for membership in the European Union (EU) are subject to the EU's policy influences and institutional regulations. Corporate laws in

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[8] Public companies in European emerging markets are required to disclose reports on corporate governance and finance, and their governance structures are subject to public regulation. For instance, the Czech Republic and Estonia do not allow board directors to serve on the supervisory board, and Hungary requires that the board of directors and the supervisory board have a majority of independent directors and that the accounting and auditing board consist only of independent directors from either of these two organizations (Cigna et al., 2017a). Further, public companies in Russia and Latvia are required to adopt a two-tier management model, and Poland requires public companies to draw a clear distinction between the board of directors and the supervisory board in terms of board composition (Iwasaki, 2003; Cigna et al., 2017b).

EU member countries are primarily based on each country's historical background. However, some EU rules govern the entire region, imposing significant restrictions on the member countries' national laws. In this regard, EU law is truly supranational. In 2001, the European Company Statute was enacted to achieve competitive business activities across the EU. Its provisions are primarily codified by EU Directive 2017/1132 (European Parliament, 2017), which relates to certain aspects of company law.[9] According to the Statute, a European firm must be established in accordance with the JSC law of the country in which it is incorporated and can choose between a two-tier and a one-tier management structure. The former represents the German approach to corporate governance and comprises the board of directors and the supervisory board, whereas the latter comprises a unitary board. In a two-tier system, the supervisory board is responsible for appointing and removing board members, whereas the general meeting of shareholders is responsible for appointing supervisory board members. The articles of incorporation specify the maximum and minimum number of board members. Although European firms must ensure employee participation in management (codetermination), the rules governing directors' and shareholders' responsibilities, corporate social responsibility, and employee participation operate as soft law, similar to policy recommendations (Horak and Poljanec, 2018).

The EU legislation, which inevitably influenced corporate laws enacted by member states and candidate countries, also significantly impacted the corporate governance rules adopted in each of these countries. Furthermore, the European Commission employs the Corporate Sustainability Reporting Directive or other similar frameworks to maintain tight control over the corporate law in each member and candidate country. For example, the European Commission once required Poland to appoint independent experts to boards and to have at least two independent members on supervisory boards, as is customary in Europe (Cigna et al., 2017b). Not only are EU member and candidate countries subject to such policy influences from the European Commission, but they are also subject to frequent interventions by the judiciary.[10]

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[9] For more details, see the European Commission's basic policy on the common EU rules on corporate law and corporate governance (https://ec.europa.eu/info/business-economy-euro/doing-business-eu/company-law-and-corporate-governance_en). According to the European Parliament, there are 24 million firms operating in the EU, approximately 80% of which are LLCs. These LLCs are required to be able to operate within the EU on the basis of a uniform legal framework (European Parliament, 2022).

[10] In July 2021, for example, the European Commission referred Bulgaria to the Court of Justice of the EU for failure to connect its business register to the EU business registers system (European

Third, as European economic integration has deepened, non-EU member countries have faced institutional pressure to conform. For example, Russia amended its corporate law to strengthen the protection of minority shareholders' property rights, which the EU values highly, and adopted a corporate governance code in line with European standards (Oda, 2012; Iwasaki, 2018). In Ukraine, where the development of the corporate law system was significantly delayed and institutional deviations from EU law were significant, the JSC law was finally enacted in 2019 after many years of twists and turns, followed by the Ukrainian National Securities and Stock Market Commission's March 2020 adoption of the corporate governance rules as soft law. Both clearly sought alignment with the EU corporate law system, specifically the aforementioned EU Directive 2017/1132 (Kostruba and Vasylieva, 2020). Numerous cases like this exist in European emerging markets, and these developments have accelerated the homogenization of corporate laws and corporate systems.

As a fourth point, we emphasize that the relationship between the state and business in European emerging markets differs markedly from that in China, where one-party rule is enforced. There are several major channels through which governments in European emerging markets influence corporate decision-making, including shareholder voting, input at board meetings as an owner, and policy interventions via regulatory agencies. While this type of government intervention is common in China, what distinguishes China from CEEs is the presence of institutions/managers that are unique to China. As stated in the preceding subsection, in Chinese state enterprises, not only is the party organization involved in key decisions of firm management, but the CPC itself forms an internal organization of the firm (Wang and Wang, 2022; Yang, 2022). The same can be said for state-owned companies that have been converted to JSCs, and "no matter what corporate governance scheme is introduced, the framework remains the same, with CPC leading and guiding the state-owned firms" (Nakaya, 2019, p. 46). The CPC does not have the same degree of penetration into the internal organization of private companies as it does in state enterprises, but the government and the party still exert some managerial and supervisory control over them by utilizing the grassroots party organization within the firm (Chen, 2020; Liu, 2020; An and Fu, 2021). Furthermore, under the Xi Jinping administration, the CPC has gradually strengthened its monitoring and supervision of Chinese firms in various ownership categories since 2013. Clearly, no European emerging market—not even Russia—can compete with China regarding the extent and intensity of state involvement in firm management.

Commission, 2021).

As previously stated, while Chinese firms and their counterparts in European emerging markets share many provisions of company law and major corporate forms, they differ significantly in the institutional environment in which the firms operate. Furthermore, state regulations apply only to publicly traded companies in both China and Europe's emerging markets. As stated in the Introduction, our goal is to thoroughly verify whether the results of previous studies on the factors affecting the board structure of firms in developed economies can be replicated in the case of firms in emerging markets. The discussion in this section clearly shows that in order for our empirical analysis to be valid, it must account for differences between Chinese firms and European emerging market firms, as well as differences in the institutional environment between public and private companies. For this reason, the sample in our empirical study is divided into four groups: Chinese public companies, European public companies, Chinese private companies, and European private companies.

3 Determinants of the Board Structure of Emerging Market Firms: Hypothesis Development

In this section, we present a set of hypotheses that can be tested using previous studies of firms in developed economies in our empirical analysis. According to Arthur (2001) and Iwasaki (2008, 2009), factors that can potentially influence board structure can be divided into two categories: "governance variables" and "business-activity variables." While governance variables address factors such as ownership structure and firm size, business-activity variables address factors such as innovation activities and financial performance. Some governance variables specifically reflect managers' bargaining power as well as the bargaining power of interested parties who disagree with managers. They are commonly referred to as "bargaining variables" to distinguish them from other governance variables. Sections 3.1–3.3 discuss the specific factors involved in each of the three variable categories and explain how they may affect the board of directors' composition. Then, in Section 3.4, we discuss the board components' interrelationships.[11]

3.1 Bargaining variables

We focus on four variables that can capture the bargaining power of managers and investors/stakeholders: (a) managerial independence from investors, (b) concentration of ownership, (c) affiliation with a business group, and (d) state and foreign investor

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[11] The discussion in this section mainly draws on Arthur (2001) and Iwasaki (2008, 2009), as well as Mak and Li (2001), Prevost et al. (2002), Perry and Shivdasani (2005), Boone et al. (2007), Linck et al. (2008), Lehn et al. (2009), Monem (2013), Chen (2014), and Iwasaki (2018).

ownership.

Previous research has repeatedly shown that corporate executives are generally opposed to board oversight and supervision. Thus, top executives who have a high degree of independence from investors and thus exercise strong managerial discretion are likely to use their bargaining power to limit the number of board positions in their company and to limit the appointment of the chairman and other board members from outside the firm.

Major shareholders, alternatively, are well-known for sending someone who represents their interests to serve on the board while keeping the board size small, thereby securing their own voice in the firm they invest in. Consequently, a business group to which the firm belongs acts as an insider owner of that firm and colludes with the managers. It is likely to try to increase the board's size to send representatives from the parent company or affiliates to serve on it, while using its bargaining power to limit the board's independence. In contrast, the state, in order to achieve its political and policy objectives, and foreign investors, in order to ensure a more reliable return on their investments, would likely try to increase the number of board positions and appoint outside directors to additional posts in order to increase management oversight and supervision.

We believe that the above assumptions are reasonable for emerging markets as well. Hence, we propose testing the four hypotheses below regarding the effect of bargaining variables on the board structure of emerging market firms.

Hypothesis 1: *Managerial independence from investors limits the size of the board and its management oversight function.*

Hypothesis 2: *Ownership concentration strengthens the board's management oversight function while limiting board size.*

Hypothesis 3: *Membership in a business group reduces the independence of the group company's board of directors while increasing board size.*

Hypothesis 4: *State and foreign investor ownership increases the board's size and strengthens the board's management oversight function.*

3.2 Other governance variables

We focus on three elements, as with other governance variables: (a) firm size, (b) firm age, and (c) the adoption of a divisionalized organizational structure.

The increase in organizational complexity caused by firm size and age gives rise to various management issues and organizational problems. As a result, there is a greater need within the company for the board's advisory function, specifically the knowledge and expertise of the board members. Because the best way to achieve board diversity is

to appoint a larger number of directors to serve on the board and hire additional outside directors, firm size and age are both expected to increase the size of the board and the presence of outsiders on the board. Furthermore, increases in board size and board independence are likely to have a synergistic effect of increasing the likelihood of the board's chairman being elected from outside the firm.

In addition to firm size and age, adopting a divisionalized organizational structure to respond to business diversification is likely to encourage corporate board expansion due to the need to secure positions for directors in charge of each division. However, it is argued that there is no easy way to predict whether internal or external personnel will fill the increased number of director positions created by business diversification. It is also unclear how the increased number of director positions will affect the channels by which the board chairman is appointed.

The following hypotheses about other governance variables are derived based on the preceding arguments.

Hypothesis 5: *Firm size and age contribute to increasing the size of the board, the proportion of outside directors on the board, and the likelihood that the chairman of the board will be elected from outside the firm.*

Hypothesis 6: *Adopting a divisionalized organizational structure increases the board size.*

3.3 Business-activity variables

We address three business-activity variables that can have a significant impact on the board structure of emerging market firms: (a) innovativeness, (b) sound financial performance, and (c) solvency.

Firms actively seeking to innovate are more likely to add a Research and Development (R&D) director to their board of directors. Furthermore, because of the high risk involved and the technological uncertainty, investing in R&D increases the need to evaluate management performance in terms of the quality of its decision-making rather than its financial performance. Internal directors must inevitably conduct these performance evaluations. As a result, intensive innovation activities are expected to increase the board's size and reduce the percentage of outside directors on the board.

Many previous studies have repeatedly demonstrated that poor firm performance and high debt levels relative to competitors and peers frequently result in the dismissal of internal directors and the appointment of outside directors to replace them. It is not difficult to imagine how firms with strong financial performance and solvency profiles might be less likely to seek management supervision from outside directors. Several studies, however, have found that past performance or financial conditions have little

effect on board size, and researchers are split on how financial performance and solvency affect board size.

These discussions give rise to two hypotheses about the effect of business-activity variables on the board structure of emerging market firms:

Hypothesis 7: *Companies with high levels of innovation form larger corporate boards with fewer outside directors.*

Hypothesis 8: *Firms with strong financial performance or solvency have fewer outside directors on their boards.*

3.4 Interactions between board components that are endogenous

Interactions between board components should also be considered. For example, firms with larger boards of directors may be more likely to bring in more outside directors. Pressure from the state and investors to appoint outside directors to ensure better corporate governance and more transparent corporate management may cause the board to increase in size, potentially increasing the likelihood that the board's chairman will be elected from among the outside directors. In turn, an externally appointed board chairman may seek to expand the power of outside directors in order to ensure their leadership in strategic decision-making or to strengthen their bargaining power with top management. Even if attempts to replace internal directors with outsiders are hampered by management opposition or other factors, increasing the number of director positions and filling those additional positions with outsiders will inevitably cause the board to grow in size. These arguments lead to the following hypothesis about board component interrelationships:

Hypothesis 9: *Board size, outside chairmanship, and board independence are all positively related.*

The discussions in this section are summarized in Table 1. In the following sections, we use an empirical analysis of a large dataset of emerging market firms to test the preceding hypotheses.

4 Data and Methodology

The data and methodology used for hypothesis testing are described in this section. Section 4.1 provides an overview of the data, and Section 4.2 explains the empirical methodology.

4.1 Data

This paper's empirical analysis data came from Orbis, a company information database compiled by Bureau van Dijk, a Moody's Analytics company. As of 2024, Orbis is the

world's largest commercial database of firm-level records, with over 400 million firms and organizations from various industries represented. It contains information on public and private companies in China and European emerging markets. Orbis contains information on each registered company's ownership structure and board structure, in addition to a business description and financial statements. This makes it an excellent source of information for this paper's research topic.[12]

The job titles of the chairman and each board member are included in the board structure data disclosed by Orbis. These data allow us to determine the total number of board members for each firm and whether the chairman and board members were appointed internally or externally. Using this feature of the Orbis database, we chose public and private companies registered in the database that were confirmed to be operating in the following 22 emerging markets as of the first quarter of 2020, and for which information on the job titles of the chairman and other members of the board is available from the database: China, five Central European nations (the Czech Republic, Hungary, Poland, Slovakia, and Slovenia), five Eastern European and Baltic nations (Bulgaria, Romania, Estonia, Latvia, and Lithuania), seven Southern European nations (Croatia, Serbia, Albania, Montenegro, North Macedonia, Bosnia and Herzegovina, and Kosovo), and four former nations of the Soviet Union (Moldova, Belarus, Ukraine, and Russia). The final sample includes 42,146 companies, with 12,546 being public and 29,600 being private.[13]

Table 2 shows down each sample firm group by number of employees and industry sector.[14] **Appendix Table A1** reports the sample firm composition for each of the 22 emerging markets. As shown in these tables, our sample includes firms of various sizes and industries. In light of the official statistics provided, it sufficiently represents firms in China and European emerging markets. In comparison to the actual population of companies, our sample has a relatively small proportion of small and medium-sized companies with fewer than 100 employees. This is primarily because the number of small and medium-sized firms with boards is limited compared to their larger counterparts with

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[12] For further details about the Orbis database, see the website of Moody's Analytics: https://www.moodys.com/

[13] In this study, we employ cross-sectional data based on firm information for 2019-2020. The main reasons are that there is very limited data on firms in some Eastern European countries and non-listed firms in China prior to 2018 and that the impact of the COVID-19 pandemic on business organizations after 2020 is unknown.

[14] The sample of Chinese public companies consists of 3,732 firms listed on stock exchanges and 6,841 OTC companies on the third- and fourth-board markets.

more than 100 employees. We have established that our sample is not biased in any way. Aside from information on the board structure of the 42,146 sample firms, we also obtained data from Orbis on managerial independence, ownership structure, firm size and age, operating industries, number of patents owned, and financial performance, as detailed in the following subsection.

4.2 Methodology

As the first stage of the empirical analysis, we perform a reduced-form estimation of the three regression equations, each of which contains one of the three board structure variables (i.e., board size of the i-th sample firm as measured by the total number of board directors (*board_size*), outside board chairmanship (*board_chairmanship*) that assigns a value of 1 to firms that elect the chairman of the board from the outside directors, and board independence defined as the proportion of outside/independent directors to all board directors (*board_independence*)) introduced on the left-hand side, and bargaining variables (*bargaining*), other governance variables (*governance*), business-activity variables (*business_activity*), and the board structure variables that do not constitute the dependent variable introduced on the right-hand side:

$$board\_size_{i,t} = \mu + \sum_{n=1}^{5} \alpha_n \cdot bargaining_{n,i,t-1} + \sum_{m=1}^{3} \beta_m \cdot governance_{m,i,t-1}$$

$$+ \sum_{l=1}^{3} \gamma_l \cdot business\_activity_{l,i,t-1} + \delta \cdot board\_chairmanship_{i,t}$$

$$+ \sigma \cdot board\_independence_{i,t} + \theta_j + \varphi_k + \varepsilon_i, \quad (1)$$

$$board\_chairmanship_{i,t}$$

$$= \mu + \sum_{n=1}^{5} \alpha_n \cdot bargaining_{n,i,t-1} + \sum_{m=1}^{3} \beta_m \cdot governance_{m,i,t-1}$$

$$+ \sum_{l=1}^{3} \gamma_l \cdot business\_activity_{l,i,t-1} + \omega \cdot board\_size_{i,t}$$

$$+ \sigma \cdot board\_independence_{i,t} + \theta_j + \varphi_k + \varepsilon_i, \quad (2)$$

$$board\_independence_{i,t}$$

$$= \mu + \sum_{n=1}^{5} \alpha_n \cdot bargaining_{n,i,t-1} + \sum_{m=1}^{3} \beta_m \cdot governance_{m,i,t-1}$$

$$+ \sum_{l=1}^{3} \gamma_l \cdot business\_activity_{l,i,t-1} + \omega \cdot board\_size_{i,t}$$

$$+ \delta \cdot board\_chairmanship_{i,t} + \theta_j + \varphi_k + \varepsilon_i, \quad (3),$$

where μ is a constant term; α, β, γ, δ, σ, and ω are the parameters to be estimated; θ is the

fixed effect for the j-th industry to which the i-th firm belongs; and ε is a disturbance term. φ is the fixed effect for the k-th country where the i-th firm resides, which is controlled using multinational data. Each of the four sample firm groups is estimated to compare how well they fit each hypothesis.

According to **Table 1**, we use five bargaining variables: (1) management independence variable based on a six-point evaluation scale provided by Bureau van Dijk, (2) ownership concentration variable proxied by average ownership share per shareholder/member, (3) dummy variable for business group affiliation that assigns a value of 1 to companies affiliated with a business group, (4) state ownership variable that assigns a value of 1 to firms with state as the ultimate owner at the 50% control threshold, and (5) foreign ownership variable that assigns a value of 1 to firms with a foreign investor as the ultimate owner. Other governance variables include (6) firm size (measured by the natural log of total assets in Euros), (7) firm age (number of years in operation), and (8) divisionalized organization (proxied by the number of operating industries at the NACE (European Classification of Economic Activities) division level.[15] Business-activity variables include (9) innovativeness, as measured by the number of granted patents owned, (10) sound financial performance, as measured by a 3-year average of profit margins, and (11) solvency, as measured by a 3-year average of solvency ratio.

The 11 types of independent variables listed above are all predetermined for the dependent variables, as indicated by the regression equations. In particular, all three types of board structure variables captured events in the first quarter of 2020, whereas the nine variables ranging from management independence to innovativeness captured events in 2019. The sound financial performance and solvency variables are expressed as a three-year average for 2017–2019 to avoid endogeneity with the dependent variable. We account for the fixed effect θ by combining 13 industry dummy variables that used the manufacturing industry as a reference category.[16] Taking into account the characteristics of each dependent variable, the first stage of estimation utilizes the Poisson maximum likelihood (ML) estimator to estimate Equation (1), a logit ML estimator to estimate Equation (2), and a tobit ML estimator to estimate Equation (3). We test the statistical significance of regression coefficients by using heteroscedasticity-consistent robust

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[15] An investigation of the board composition of 100 randomly selected firms from our sample with two or more registered industrial sectors confirmed a clear positive correlation between the number of registered industrial sectors and the presence of directors representing specific business divisions.

[16] These industrial sector categories correspond to the industrial classifications used in **Table 2**.

standard errors.

Although we assume that the board structure variables are endogenous, the reduced-form estimation performed during the first stage of the empirical analysis described above takes no specific measures to address the potential simultaneity bias caused by the endogenous relationships among these variables. Simultaneity bias can cause estimation results to be distorted and lead to incorrect conclusions. As a second step, we attempt structural estimation of simultaneous equation models to address this issue. However, as Barnhart and Rosenstein (1998), Bekiris (2013), and other experts in applied microeconometrics have repeatedly pointed out, estimation of simultaneous equation models can lead to unpredictable results, as minor errors in model specification can have system-wide consequences. In other words, introducing independent variables carelessly into the structural estimation of a corporate governance model whose true structure is unknown poses a substantial risk to the empirical analysis.

As a less risky alternative to model specification, we employ Iwasaki's (2009) estimation strategy, in which independent variables estimated to be statistically significant at the 10% level or less in the reduced-form estimation of Equations (1), (2), and (3) are combined with endogenized board structure variables to generate endogenous board structure models. The structural estimation of these models is done using the two-stage least-squares method (2SLS) or the three-stage least-squares method (3SLS). To ensure that the dependent variables fit the least-squares estimates better, we estimate these models using a logarithm of the board size variable, a logarithm of the outside board chairmanship variable with 1 added to it, and the board independence variable converted using Klein's (2002) logistic conversion technique. The models to be reported were chosen based on the Hausman test of the null hypothesis that the 3SLS model has consistency while the 2SLS model does not.

Table 3 lists the names, definitions, and descriptive statistics for the variables used in the empirical analysis by sample firm group. **Appendix Table A2** shows a correlation matrix for the independent variables for each sample firm group. As shown in **Table A2**, the correlation coefficients of all simultaneously estimated variable combinations fall below the 0.70 threshold for possible multicollinearity. In addition, we confirmed in our preliminary estimation procedure that the variance inflation factors calculated for all independent variables are less than 5.0.

5 Board Structure in Emerging Market Firms: A Statistical Overview

This section provides a statistical overview of the board structure of the 42,146 sample firms from China and 21 European emerging markets to help readers understand the estimation results reported in this paper.

In the first quarter of 2020, sample firms had 308,243 directors, an average of 7.31 directors per firm, according to our data. The total/average number of directors per sample firm group type is 97,192/9.19 for Chinese public companies, 11,420/5.79 for European public companies, 18,818/5.01 for Chinese private companies, and 152,970/5.92 for European private companies. Quan and Zhang (2021) and Wang et al. (2021) reported the number of directors per firm to be 9.51 and 9.32, respectively, in their studies of Chinese listed firms, figures that do not differ significantly from those in our sample. Although data on the average number of directors in European firms are scarce, Muravyev (2017) and Nikulin et al. (2020) reported 8.79 and 8.96 directors per Russian-listed firm, respectively, and Iwasaki (2018) reported 4.8 directors per Russian private firm. According to the summary statistics for Russian firms in **Appendix Table A1**, there does not appear to be a significant difference between the firms reported in previous studies and our sample firms.

Figure 1 shows the director composition by job classification for each of the four sample firms. As shown in the figure, insider directors are divided into four categories: (a) top managers (CEO, president, general manager, etc.) and other senior executives (vice president, CFO, etc.), (b) other managers, (c) employee representatives, and (d) other insider directors; and outside directors are divided into two categories: (e) independent directors[17] and (f) other outside directors. The figure shows the number of directors in each job category and their share of the total. Surprisingly, although China and the former socialist countries of Europe are, or were, "working class countries," only a small number of directors classified as employee representatives can be found in all sample firm groups, except for European private companies. Furthermore, even among public companies, independent directors constitute only a small percentage of the board, and their presence is quite limited compared to firms in advanced countries. **Figure 1** also shows that, except for European public companies, outside/independent directors do not constitute a majority of the board, as evidenced by the ratio of outside/independent directors to all directors, which is 47.0% for Chinese public companies, 63.0% for

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[17] The term *independent director* here refers to a person who is registered with Orbis as a lawyer, accountant, tax accountant, university faculty member, or other outside expert in corporate management, which is not necessarily consistent with the definitions of independent directors as stipulated in the corporate laws and other regulations of the countries studied.

European public companies, 43.0% for Chinese private companies, and 45.2% for European private companies. This finding is consistent with the Chinese studies of Zhang et al. (2018) and Wang et al. (2021), as well as the Russian studies of Muravyev (2017) and Iwasaki (2018), which report a much lower than 50% ratio of outside/independent directors to all board members. This suggests that emerging market corporate governance systems are still in their infancy.

Figure 2 shows the frequency distribution of board size. Private company boards in China and Europe tend to have few members. In fact, 73.4% or 2,759 Chinese private companies and 60.4% or 15,611 European private companies have boards of five or fewer members. In contrast, 61.6% or 6,512 of Chinese public companies appoint between five and eight directors. In terms of board size distribution, comparing these three sample firm groups and European public companies reveals that European public companies are quite different from other groups. In fact, although European public companies with 9 to 13 board directors represent the peaks of the frequency distribution shown in Figure 2, they account for only 28.7% of the total, or 566 firms, with so many other firms having boards of varying sizes. Furthermore, 8.5% of the 167 European public companies have boards with 30 or more members.

Figure 3 shows the difference in management attitudes toward appointing the board chairman between public and private companies. The overwhelming majority of public companies in both China and Europe appear to appoint the board chairman from outside the firm, with the percentage of outside board chairpersons among all board chairpersons being 90.3% in China and 91.4% in Europe.[18] In contrast, only 64.0% of Chinese private companies and a mere 24.3% of European private companies appoint the board chairman from outside directors.

The differences in the appointment route of board chairmen among the sample firm groups can be explained to some extent by the board members' characteristics. As suggested in Figure 4, which shows the distribution of sample firm groups based on the degree of board independence, it is clear that European public companies are eager to appoint outsiders to their boards. In fact, 77.8% or 1,535 of European public companies have a board independence ratio of 50% or higher, and it is not surprising that most of these firms appoint the board chairman from among their outside directors. European public companies stand out when compared to Chinese public companies, Chinese private

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[18] Our observation on the percentage of Chinese public companies appointing the board chairman from outside the firm is slightly higher than the 87.6% estimated by Wang et al. (2021) for the observation period from 2004 to 2014.

companies, and European private companies, where only 47.7% (5,041 firms), 41.8% (1,571 firms), and 45.3% (11,698 firms) of all samples have a board independence ratio of 50% or more. Even more intriguing is the trend of polarization among European private companies. Although 28.4% or 7,341 of European private companies have boards with at least 80% outside/independent directors, up to 44.3% of 11,457 have boards with less than 10% outside/independent directors. This extreme polarization trend in board composition has been repeatedly highlighted by Iwasaki (2008, 2018) in studies of Russian firms, and it appears to be prevalent in emerging European markets.[19]

Table 4 examines the relationship between board size, outside board chairmanship, and board independence for each sample firm group. As shown in **Table 1**, we assume a positive correlation between these three board structure variables. **Table 4** shows that our prediction for Chinese public companies and European private companies is likely to be correct. In contrast, a negative correlation between board size and board independence is observed among European public companies and Chinese private companies, which contradicts our expectations. Multivariate regression analysis is required to determine whether these findings are replicated even after controlling for other potential influencing factors.

It is worth noting that the results presented in **Appendix Table A1** and our preliminary data analysis have confirmed that each European emerging market generally shares the set of characteristics we outlined above for European corporate board structure. However, there is some variation across countries. Controlling for a country-level fixed effect in the regression estimation of the European company models effectively addresses this heterogeneity.

6 Estimation Results

This section presents the estimation results derived from the data and empirical methodology described in Section 4. We review the results of the reduced-form estimation

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[19] The polarization phenomenon observed in the board composition of European private companies is intimately related to the fact that former state enterprises, which were established during the socialist era and privatized during the transition period, play a pivotal role in the corporate sector of these countries. Specifically, in the CEEs and the former states of the Soviet Union, while many socialist state enterprises were sold directly to strategic investors or were acquired by outside investors through public auctions or other means, a significant number of firms were acquired by their own management or employees. The latter so-called insider-controlled firms are organizationally closed and have serious issues in terms of corporate governance (Iwasaki and Mizobata, 2018).

of the models with board size, outside board chairmanship, and board independence as dependent variables in Sections 6.1–6.3. In Section 6.4, we examine at the structural estimation results for endogenous board structure models.

6.1 Board size model

Table 5 presents the results of the Poisson ML estimation of the board size model expressed in Equation (1). This table shows that the predicted sign relationships are observed for all bargaining variables estimated to be statistically significant at the 10% level or less, except for managerial independence in the Chinese public company model [1]. This implies that managerial independence suppresses the board size of private companies in China and European emerging markets, and ownership concentration negatively impacts the board size of all sample firm groups except Chinese private companies. Alternatively, all other things being equal, firms affiliated with a business group and firms owned by the state or foreign investors tend to have larger boards.

The coefficients for other governance variables strongly support our hypotheses regarding the effects of firm size, firm age, and divisionalized organization on board size, as proved by the statistically significant coefficients for these three variables, all showing a positive sign in line with our predictions, as summarized in **Table 1**. In particular, Models [2] and [4] reveal the importance of other governance variables as determinants of board size in European firms, with the three variables estimated to be significant. Consequently, as shown in Models [1] and [3], the effects of firm size on private companies and firm age on public companies in China are estimated to be insignificant, contrary to our expectations.

Concerning business-activity variables, innovativeness is shown to have equally large effects on board size in all sample firm groups, as evidenced by the significant and positive estimates presented in **Table 5**, which strongly confirms our prediction. It also became evident that sound financial performance and solvency negatively affect board size in emerging markets as observed in developed economies.

Regarding board structure variables, while the coefficients for outside board chairmanship are significantly positive at the 1% level in all four models, thus strongly supporting our hypothesis, the coefficients for board independence are estimated to be significant and negative in all models except Model [4], which rejects our hypothesis. We re-examine this finding referring to the models that endogenize the board structure variables in Section 6.4.

6.2 Outside board chairmanship model

The results of the logit ML estimation of the outside board chairmanship model specified in Equation (2) are reported in **Table 6**. As compared to the board size models, relatively few variables in these models support our hypotheses. In fact, our predictions regarding the effects of bargaining variables on outside board chairmanship are supported only by ownership concentration among Chinese firms, affiliation with a business group among Chinese public companies and European private companies, state ownership among Chinese public companies, and foreign ownership among Chinese private companies. Furthermore, the concentration of ownership among European public companies and managerial independence, state ownership, and foreign ownership among European private companies are estimated to be significant with unpredicted signs.

Similar trends are observed in the effects of other governance variables and business-activity variables on outside board chairmanship, with variables such as firm size, firm age, and innovativeness producing mixed results. In contrast, solvency produced estimation results consistent with our hypothesis but only in the Chinese private company Model [3]. It should be noted that divisionalized organizations, whose direction of effect is theoretically difficult to predict, have a significantly positive impact on European firms regardless of their listing status.

The results produced by the board structure variables stand in sharp contrast to the estimation results produced by the above variables. Both the board size and independence display positive estimates at the 1% significance level in all models. A universal rule that a resolution of the board shall elect the chairman of the board of directors is in force even in emerging markets, which seems to explain our finding that outside board chairmanship is strongly and positively correlated with board size and board independence.

6.3 Board independence model

Table 7 shows the results of the tobit ML estimation of Equation (3), which formulates the board's independence model. In terms of explanatory power and the degree to which they support our hypotheses, the models in this table outperform the outside board chairmanship models in **Table 6** and produce results similar to those of the board size models in **Table 5**. In fact, once statistically significant, the seven variables, which include managerial independence, affiliation with a business group, state ownership, firm size, firm age, sound financial performance, and solvency, strongly support our predictions about the impact on board independence across sample firm groups. However, the sign relationships between the significant estimates of ownership concentration, foreign ownership, and innovativeness are inconsistent across models.

The estimation results for the board structure variables are particularly interesting in

this context. In fact, at the 1% level, all four models produced significantly positive estimates for outside board chairmanship. According to our prediction, this result strongly suggests the existence of a close and positive correlation between the frequency with which the board chairman is elected from outside the firm and the presence of outside/independent directors on the board. The coefficients for board size, alternatively, are significantly negative in all models except Model [4], which contradicts both the empirical results of many previous studies and our assumptions. We must re-examine the effect of board size in the board independence model and the effect of board independence in the board size model, using endogenous models for these two variables.

6.4 Endogenous board structure model

Table 8 displays the structural estimation results of the simultaneous equation model. The model, as described in Section 4.2, comprises endogenized board structure variables and independent variables that show statistically significant estimates at the 10% level or less in the reduced-form estimation results shown in **Tables 5**, **6**, and **7**. **Table 8** also shows the Hausman test results for model selection, confirming the consistency of the 3SLS estimator for Chinese and the 2SLS estimator for European company models.[20]

Consistent with previous studies, in the board structure model with explicitly endogenized board structure variables, almost all variables produced estimates that corresponded well with those produced by reduced-form estimation in terms of statistical significance and coefficient signs. However, the statistical significance of some independent variables was less than 10%, and their signs were opposite to those in the reduced-form estimation. Indeed, we found 27 cases in which the variable estimated at 10% or higher significance in the reduced-form estimation did not reach 10% significance level in the structural estimation. Furthermore, in Model [4], we found a case of foreign ownership estimated in the regression equation with outside board chairmanship as the dependent variable, which turned out to be significant in both the reduced-form and structural estimations but with a negative sign in the former and a positive sign in the latter. Furthermore, in Model [4], the coefficient of board independence in the regression equation that has the board size on its right-hand side and the coefficient of the board size in the regression equation that has board independence on its right-hand side turned out to be insignificant in the reduced-form estimation. However, structural estimation was significantly positive at the 1% level.

As a result, when compared to the reduced-form models, the structural models used

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[20] In the **Appendix**, we report the results of simultaneous equation modeling of board structure for Chinese listed firms and OTC companies individually.

to empirically assess the extent to which each independent variable affects board structure produce limited insights. However, when compared to the reduced-form estimations, the variables estimated at the 10% level or with higher statistical precision in the structural estimation provided substantially more support for our hypotheses. Specifically, the significant estimates are shown in **Table 8** for seven variables, including two bargaining variables: managerial independence and affiliation with a business group; all three other governance variables, and two business-activity variables, sound financial performance and solvency. Most of the significant estimation results for the remaining four variables, which include ownership concentration, state ownership, foreign ownership, and innovativeness, support our hypotheses.

A similar trend is observed for the board structure variables, with estimation results significant at the 10% level or less in **Table 8** showing substantially greater agreement with our theoretical arguments about the determinants of board components than those reported in **Tables 5**, **6**, and **7**. In fact, except for board independence in the regression equations for public company models [1] and [2], where board size is introduced on the left-hand side, the regression coefficients for the statistically significant board structure variables are all positive, consistent with our hypotheses. In other words, similar to companies in developed economies, the three factors of board size, outside board chairmanship, and board independence are likely to determine the board structure of emerging market firms while interacting in ways that benefit the others.

7 Conclusions

This paper explored the board structure of 42,146 companies operating in China and 21 European emerging markets and empirically analyzed its determinants. We discovered that, except for European public companies, these economies have issues with corporate governance systems, with the majority of directors appointed internally and a low presence of outside directors on the board compared to developed economies. Furthermore, even among emerging market firms, we found notable differences in board size, the frequency with which the board chairman is elected from outside the firm, and the proportion of outside/independent directors to all board members between Chinese and European firms as well as between public and private companies.

One of the three board structure variables was placed on the left-hand side of the structural estimation of the simultaneous equation model specified based on the reduced-form estimation results of the regression equations, and the bargaining variables, other governance variables, and business-activity variables were introduced on the right-hand

side. The results strongly suggest the following points: First, emerging market firms' boards of directors are likely to be organized following an economic logic repeatedly demonstrated in developed economies. Indeed, according to **Table 9**, which compares the theoretical predictions discussed in Section 3 with the estimation results of the endogenous board structure model reported in Section 6.4, the statistically significant sign relationships of the independent variables ranging from managerial independence to solvency support our hypotheses in all but four cases.

Second, we found significant differences in several factors that strongly affect board structure between China and European emerging markets and between public and private companies. In fact, as shown in **Table 9**, a comparison of the four sample firm groups revealed that European private companies have the most independent variables with a significant effect, followed by Chinese public companies. European public companies and Chinese private companies were found to have a much smaller number of factors strongly influencing board structure when compared to these two groups of firms. Even in previous studies of firms in advanced nations, we must note that the combination of influencing factors determining board structure in a statistically significant and theoretically predicted fashion is not always consistent across studies (Hermalin and Weisbach, 2003; Adams et al., 2010). This is not surprising given that, even in developed economies, the institutional environment and other conditions surrounding firms vary greatly across countries and between public and private firms. In this sense, the findings on emerging market firms discussed above are not novel, but they are interesting and instructive for a better understanding of corporate governance behavior in China and European emerging markets. This point requires more research and analysis.

Furthermore, we found an extremely close interdependence of the three elements that characterize board structure as a third point. Indeed, as shown in **Table 9**, the board structure variables introduced on the right-hand side of the endogenous board structure model were estimated to be significant on multiple occasions. Furthermore, except for the effect of board independence on board size in Chinese and European public companies and the effect of board size on board independence in European public companies, the estimation results from these models strongly suggest that the board structure variables mutually reinforce each other. Some empirical studies, whether intentionally or unintentionally, have paid little attention to the interdependence of board size, outside board chairmanship (or CEO duality), and board independence. However, as previously emphasized by several previous studies, including those of Mak and Li (2001), Linck et al. (2008), Iwasaki (2009), Monem (2013), and Chen (2014), it is critical to control for

all other board structure variables as influencing factors when estimating a specific board structure variable. Specifically, the board structure variables introduced on the right side of the regression equation should be given econometrically appropriate treatment, such as the use of predetermined variables or variable endogenization. Our empirical analysis appears to have clarified this point once more.

Although our research contributed to the study of the internal organization of emerging market firms in terms of board structure, it also raised several issues. The following three questions, in particular, remain unanswered: To begin, why do the combinations of factors that have a statistically significant effect on board structure differ so dramatically between the four sample firm groups? Second, why does board independence, regardless of location, severely limit the board size of emerging market public companies? Third and finally, did the COVID-19 pandemic have a significant impact on the board composition of emerging market firms? Hopefully, additional research will answer these questions.

Appendix Comparison of Chinese listed and OTC companies

We included Chinese listed companies and OTC companies together in the category of public companies based on the fact that these two types of firms are decidedly different from private companies in terms of the legal regulation of the corporate governance system. At the same time, there may be differences in the composition of the board of directors and its determinants between listed firms and OTC companies in China. We report the results of the univariate comparison and supplement regression estimation in this Appendix by dividing the sample of Chinese public companies into listed firms and OTC counterparts.

The descriptive statistics of the dependent variables in **Appendix Table A3** show that, despite their smaller size, OTC company boards have achieved a level of outside board chairmanship and board independence comparable to those of listed firms. In anticipation of future stock listings, OTC companies tend to mimic the board structure of listed firms. At the same time, the descriptive statistics of the independent variables show that OTC firms are underdeveloped in size, innovativeness, and financial performance compared to listed firms.

Appendix Table A4 summarizes the results of the simultaneous equation modeling of board structure. As in Section 6, we focus on the estimation results of Models [4] and [8]. These models show that the factors that have a statistically significant impact on board structure differ significantly between listed and OTC companies. This finding,

however, is not surprising given the differences in the two firm groups' development levels and business environments. Rather, except for firm age, the signs of the statistically significant independent variables are consistent with those of endogenous variables in both cases. In this regard, the mechanism of board structure formation in OTC companies in China is more similar to that of listed companies than to that of private firms.

References

Adams, Renée B., Benjamin E. Hermalin, and Michael S. Weisbach (2010) The role of boards of directors in corporate governance: A conceptual framework and survey. *Journal of Economic Literature*, 48(1): 58-107.

An, Zhimin, and Jiadi Fu (2021) Study on enhancing the organizational power of party organizations in non-public firms in new era. *Administration and Law,* 10: 26-33. (in Chinese)

Aoki, Masahiko (1988) *Information, Incentives and Bargaining in the Japanese Economy*. Cambridge University Press: Cambridge.

Arthur, Neal (2001) Board composition as the outcome of an internal bargaining process: Empirical evidence. *Journal of Corporate Finance*, 7(3): 307-340.

Asanuma, Banri (1997) *Mechanisms of Innovative Adaptation in Japanese Business Organizations: Structure and Functions of Long-Term Business Relationships*. Toyo Keizai Publishing: Tokyo. (in Japanese)

Åslund, Anders (2013) *How Capitalism Was Built: The Transformation of Central and Eastern Europe, Russia, and Central Asia*. Second edition. Cambridge University Press: New York.

Barnhart, Scott W., and Stuart Rosenstein (1998) Board composition, managerial ownership, and firm performance: An empirical analysis. *Financial Review*, 33(4): 1-16.

Bekiris, Fivos V. (2013) Ownership structure and board structure: Are corporate governance mechanisms interrelated? *Corporate Governance: The International Journal of Business in Society*, 13(4): 352-364.

Boone, Audra L., Laura Casares Field, Jonathan M. Karpoff, and Charu G. Raheja (2007) The determinants of corporate board size and composition: An empirical analysis. *Journal of Financial Economics*, 85(1): 66-101.

Cerha Hempel (2020) *Doing Business in Belarus 2020*. Cerha Hempel: Minsk.

Chen, Ming-Yuan (2014) Determinants of corporate board structure in Taiwan. *International Review of Economics and Finance*, 32: 62-78.

Chen, Xin (2020) An empirical study on improving the party's organizational capacity in non-public enterprises: Evidence from Quanzhou economic and technological development zone. *Future and Development,* 44(12): 18-22. (in Chinese)

Cheng, Zhang, Rajah Rasiah, and Cheong Kee Cheok (2018) Determinants of board composition and corporate governance in Chinese enterprises since reforms began: A comparison of controlling shareholders. *The Chinese Economy*, 51(5): 446-467.

Cigna, Gian Piero, Pavel Djuric, and Yarina Kobel (2017a) *Corporate Governance in Transition Economies: Hungary Country Report*. EBRD: London.

Cigna, Gian Piero, Yaryna Kobel, and Alin Sigheartau (2017b) *Corporate Governance in Transition Economies: Poland Country Report*. EBRD: London.

China Securities Regulatory Commission (2020) *China Securities Regulatory Commission Annual Report 2020*. China Securities Regulatory Commission: Beijing.

Dore, Roland P. (1973) *British Factory-Japanese Factory: The Origins of National Diversity in Industrial Relations*. University of California Press: Berkeley.

European Commission (2021) Company Law: European Commission refers Bulgaria to the Court of Justice of the European Union for failure to connect its business register to the EU Business Registers system. Press release of European Commission on 15 July 2021: Brussels. (Available at: https://ec.europa.eu/commission/presscorner/detail/en/ip_21_3631.

European Parliament (2017) *Directive 2017/1132 of the European Parliament and of the Council of 14 June 2017 Relating to Certain Aspects of Company Law*.

European Parliament (2022) Fact Sheets on the European Union – Company law. (Available at: https://www.europarl.europa.eu/factsheets/en/sheet/35/company-law.

Hermalin, Benjamin E., and Michael S. Weisbach (2003) Board of directors as an endogenously determined institution: A survey of the economic literature. *Economic Policy Review*, 9(1): 7-26.

Horak, Hanam, and Kristijan Poljanec (2018) Recent developments in European company law: A way forward to more social Europe? *INTEREULAWEAST*, 5(2): 151-167.

Iwasaki, Ichiro (2003) The governance mechanism of Russian firms: Its self-enforcing nature and limitations. *Post-Communist Economies*, 15(4): 503-531.

Iwasaki, Ichiro (2008) The determinants of board composition in a transforming economy: Evidence from Russia. *Journal of Corporate Finance*, 14(5): 532-549.

Iwasaki, Ichiro (2009) The structure of corporate boards. In: Dolgopyatova, Tatiana, Ichiro Iwasaki, and Andrei A. Yakovlev (eds.), *Organization and Development of Russian Business: A Firm-Level Analysis*. Palgrave Macmillan: Basingstoke, pp. 89-121.

Iwasaki, Ichiro (2018) Corporate governance system and regional heterogeneity: Evidence from East and West Russia. *International Journal of the Economics of Business*, 25(3): 391-420.

Iwasaki, Ichiro, and Satoshi Mizobata (2018) Post-privatization ownership and firm performance: A large meta-analysis of the transition literature. *Annals of Public and Cooperative Economics*, 89(2): 263-322.

Jiang, Daxing (2020) "The socialist (public) logic" in the reform of the Company Law. *China Business and Market*, 34(7): 3-16. (in Chinese)

Klein, April (2002) Economic determinants of audit committee independence. *Accounting Review*, 77(2): 435-452.

Kostruba, Anatoliy V., and Valentyna Vasylieva (2020) Corporate law in Ukraine within the framework of approaching the European Union standards. *Law Review of Kyiv University of Law*, 2020(1): 181-188.

Lehn, Kenneth. M., Sukesh Patro, and Mengxin Zhao (2009) Determinants of the size and composition of US corporate boards: 1935-2000. *Financial Management*, 38(4): 747-780.

Lin, Karen Jingrong, Xiaoyan Lu, Junsheng Zhang, and Ying Zheng (2020) State-owned enterprises in China: A review of 40 years of research and practice. *China Journal of Accounting Research*, 13(1): 31-55.

Linck, James S., Jeffry M. Netter, and Tina Yang (2008) The determinants of board structure. *Journal of Financial Economics*, 87(2): 308-328.

Liu, Huilong, Yunfei Qi, and Hong Wang (2021) Do large shareholders separate the roles of CEO and board chairman for expropriations? Evidence from pyramidal business groups in China. *Asia-Pacific Journal of Accounting and Economics*, 28(3): 334-356.

Liu, Xiaoqi (2020) An examination of the embedding model of the party building in the governance structure of non-public firms. *Economic Research Guide*, 3: 10-11. (in Chinese)

Ma, Xinxin, and Ichiro Iwasaki (2021) Does communist party membership bring a wage premium in China? A meta-analysis. *Journal of Chinese Economic and Business Studies*, 19(1): 55-94.

Mak, Yuen Teen, and Yuan Li (2001) Determinants of corporate ownership and board structure: Evidence from Singapore. *Journal of Corporate Finance*, 7(3): 235-256.

Monem, Reza M. (2013) Determinants of board structure: Evidence from Australia. *Journal of Contemporary Accounting and Economics*, 9(1): 33-49.

Muravyev, Alexander (2017) Boards of directors in Russian publicly traded companies in 1998-2014: Structure, dynamics and performance effects. *Economic Systems*, 41(1): 5-25.

Nakaya, Nobuhiko (2019) Party rule and state control in Chinese state-owned firms: Party administrative officials, joint affairs, and political clauses in the articles of incorporation. *Economic Research*, 123: 1-51. (in Japanese)

Nikulin, Egor. D., Andrey. A. Sviridov, and Marat V. Smirnov (2020) The relationship of board of directors, audit committee and earnings management: Analysis of Russian public companies. *Russian Management Journal*, 18(2): 189-216. (in Russian)

OECD (1999) *OECD Principles of Corporate Governance*. OECD: Paris.

Oda, Hiroshi (2012) *Russian Commercial Law*. Second edition. Nijhoff: Brill. Leiden.

Odehnalová, Pavla, and Petr Pirožek (2018) Corporate board composition in family businesses: Evidence from the Czech Republic. *Journal of Contemporary Management Issues*, (23): 155-173.

Perry, Tod, and Anli Shivdasani (2005) Do boards affect performance? Evidence from corporate restructuring. *Journal of Business*, 78(4): 1403-1432.

Prevost, Andrew K., Ramesh P. Rao, and Mahmud Hossain (2002) Determinants of board composition in New Zealand: A simultaneous equations approach. *Journal of Empirical Finance*, 9(4): 373-397.

Quan, Yi, and Wenlan Zhang (2021) Geographic distance and board monitoring: Evidence from the relocation of independent directors. *Journal of Corporate Finance*, 66: article 101802.

Roberts, John (2004) *The Modern Firm: Organizational Design for Performance and Growth*. Oxford University Press: Oxford.

Saito, Naoto (2021) Three Focuses on Innovation: China DIR Research Report. Daiwa Institute of Research: Tokyo. (in Japanese)

Turley, Gerard, and Peter J. Luke (2010) *Transition Economics: Two Decades On*. Routledge: London and New York.

Vutt, Andres, and Margit Vutt (2017) Duties and liability of the members of the supervisory board of limited companies in Estonia. *Juridica International*, 2017(6): 66-75.

Wang, Fangjun, Shuolei Xu, Charles P. Cullinan, and Junqin Sun (2021) Board independence and board size: An examination of other shareholder constraints. *Journal of Developing Areas*, 55(3): 95-111.

Wang, Jinzhu, and Xiaohan Wang (2022) Evolution, innovation, and enlightenment of the rights and responsibilities construction of party organization in state-owned firms. *Journal of Socialist Theory Guide*, 8: 23-29. (in Chinese)

Wang, Wenge (2018) Board independence of listed companies in the US and China. *Asian Journal of Law and Economics*, 9(3): 1-21.

Yang, Jing (2022) Study on the integration of party building into corporate governance in state-owned mixed-ownership firms. *Modern Business Trade Industry*, 13: 109-110. (in Chinese)

Yu, Mei, and John K. Ashton (2015) Board leadership structure for Chinese public listed companies. *China Economic Review*, 34: 236-248.

Zhang, Cheng, Kee Cheok Cheong, and Rajah Rasiah (2018) Board independence, state ownership and stock return volatility during Chinese state enterprise reform. *Corporate Governance: The International Journal of Business in Society*, 18(2): 220-232.

Table 1. Theoretical prediction of the determinants of board structure in emerging market firms

	Board structure[a,b]		
	Board size	Outside board chairmanship	Board independence
Bargaining variables			
Managerial independence	−	−	−
Ownership concentration	−	+	+
Affiliation with a business group	+	−	−
State onwership	+	+	+
Foreign ownership	+	+	+
Other governance variables			
Firm size	+	+	+
Firm age	+	+	+
Divisionalized organization	+	?	?
Business-activity variables			
Innovativeness	+	−	−
Sound financial performance	?	−	−
Solvency	?	−	−
Board structure variables (endogeneous variables)			
Board size		+	+
Outside board chairmanship	+		+
Board independence	+	+	

Note:

[a] '+' stands for a positive correlation, '-' stands for a negative correlation, and '?' indicates that the effect is unpredictable.

[b] The definition of each variable conforms to that in Table 3.

Table 2. Composition of sample firms by number of employees and industry

	Number of sample firms				Proportion (%)			
	Chinese public companies	European public companies	Chinese private companies	European private companies	Chinese public companies	European public companies	Chinese private companies	European private companies
Composition by number of employees								
Firms with less than 100 employees	1,963	350	551	9,032	18.6	17.7	14.7	34.9
Firms with from 100 to 499 employees	4,513	800	1,844	12,605	42.7	40.5	49.1	48.8
Firms with from 500 to 999 employees	1,143	311	554	2,327	10.8	15.8	14.7	9.0
Firms with 1000 or more employees	2,954	512	808	1,879	27.9	26.0	21.5	7.3
Composition by industry								
Agriculture, forestry, and fishing	189	60	32	1,498	1.8	3.0	0.9	5.8
Mining and quarrying	111	67	13	341	1.0	3.4	0.3	1.3
Manufacturing	5,840	903	2,672	9,862	55.2	45.8	71.1	38.2
Electricity, gas, steam, and air conditioning supply	147	119	38	779	1.4	6.0	1.0	3.0
Water supply, sewerage, waste management, and remediation activities	132	26	5	827	1.2	1.3	0.1	3.2
Construction	137	120	60	1,798	1.3	6.1	1.6	7.0
Wholesale and retail trade, repair of motor vehicles and motorcycles	1,311	164	470	3,669	12.4	8.3	12.5	14.2
Transportation and storage	184	108	83	1,772	1.7	5.5	2.2	6.9
Accommodation and food service activities	42	71	14	614	0.4	3.6	0.4	2.4
Information and communication	1,239	59	132	1,049	11.7	3.0	3.5	4.1
Financial and insurance activities	127	151	126	728	1.2	7.7	3.4	2.8
Real estate activities	129	29	21	565	1.2	1.5	0.6	2.2
Professional, scientific, and technical activities	698	62	50	1,573	6.6	3.1	1.3	6.1
Administrative and support service activities	287	34	41	768	2.7	1.7	1.1	3.0
Total	10,573	1,973	3,757	25,843	100.0	100.0	100.0	100.0

Note: Appendix Table A1 shows the composition of sample firms by country and in all 22 emerging markets.

Source: Authors' calculations based on the Orbis Database

Table 3. Names, definitions, and descriptive statistics of variables used in empirical analysis

Variable name	Definition	Chinese public companies			European public companies			Chinese private companies			European private companies		
		Mean	Median	S.D.	Mean	Median	S.D.	Mean	Median	S.D.	Mean	Median	S.D.
Dependent variables[a]													
Board size	Total number of board directors	9.192	7	7.618	15.654	13	11.080	5.009	4	4.739	5.919	4	5.492
Outside board chairmanship	Dummy for firms with an outside board chairman	0.903	1	0.296	0.914	1	0.280	0.640	1	0.480	0.243	0	0.429
Board independence	Proportion of outside/independent directors	46.327	44.444	13.860	64.560	69.231	21.345	43.988	40.000	18.356	40.387	33.333	40.601
Independent variables[b]													
Managerial independence[c]	6-point scale for management independence from owners	3.419	5	3.006	2.459	0	3.052	1.104	0	2.230	1.145	0	2.363
Ownership concentration	Average ownership share per shareholder/member	0.223	0.100	0.288	0.297	0.200	0.268	0.525	0.500	0.345	0.635	0.500	0.336
Affiliation with a business group	Dummy for business group companies	0.787	1	0.410	0.866	1	0.341	0.881	1	0.324	0.725	1	0.446
State ownership	Dummy for firms with state as the ultimate owner at the 50% control threshold	0.025	0	0.155	0.093	0	0.291	0.064	0	0.244	0.096	0	0.294
Foreign ownership	Dummy for firms with a foreign investor as the ultimate owner at the 50% control threshold	0.006	0	0.075	0.147	0	0.354	0.159	0	0.366	0.254	0	0.436
Firm size	Natural logarithm of total assets in Euros	11.430	10.599	2.732	11.349	10.969	2.487	16.135	16.638	2.222	14.071	14.948	3.028
Firm age	Years in operation	17.201	17	6.379	51.375	35	38.188	15.850	16	7.350	25.726	24	18.770
Divisionalized organization[d]	Number of operating industries	1.231	1	0.680	1.709	1	1.974	1.054	1	0.454	4.680	2	5.768
Innovativeness[e]	Natural logarithm of total number of granted patents plus one	0.804	0.000	1.710	0.322	0.000	0.876	0.471	0.000	1.329	0.097	0.000	0.474
Sound financial performance	3-year average of profit margins	9.615	8.667	13.163	4.506	3.380	14.917	6.393	4.040	12.654	4.934	3.860	11.511
Solvency	3-year average of solvency ratio	57.009	57.923	19.572	49.539	52.315	29.464	42.830	42.907	24.374	47.515	48.860	28.256

Notes: Appendix Table A2 shows a correlation matrix of the independent variables.

[a] Takes a value in the first quarter of 2020

[b] Observation period of the variables of sound financial performance and solvency is 2017–2019, while that of other variables is 2019.

[c] Based on BvD independent indicator ranging from D to A+

[d] According to the NACE Rev 1 secondary codes

[e] According to Moody's Analytics, the information source of patent data is the PATSTAT database, established and maintained by the European Patent Office. Although the PATSTAT is a worldwide database containing bibliographical data on the majority of patents currently in force, it aggregates many different sources with various coding policies and hence may not always allow for the inclusion of all patents.

Figure 1. Composition of 308,243 board directors appointed by 42,146 emerging market firms by job classification

(a) Chinese public companies (10,573 firms)

Top managers and other senior executives, 28242, 29.1%

Other managers, 22935, 23.6%

Employee representatives, 217, 0.2%

Other insider directors, 148, 0.2%

Independent directors, 5020, 5.2%

Other outsider directors, 40630, 41.8%
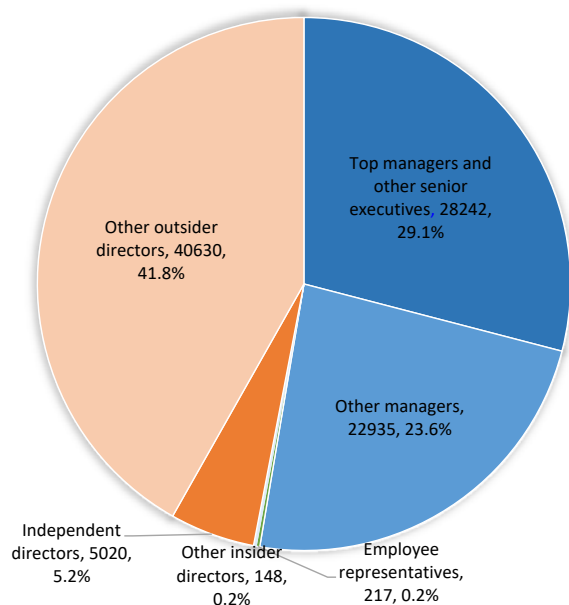
(b) European public companies (1,973 firms)

Top managers and other senior executives, 3588, 11.6%

Other managers, 6922, 22.4%

Employee representatives, 98, 0.3%

Other insider directors, 812, 2.6%

Independent directors, 615, 2.0%

Other outsider directors, 18851, 61.0%

(c) Chinese private companies (3,757 firms)

Top managers and other senior executives, 4772, 25.4%

Other managers, 5930, 31.5%

Employee representatives, 16, 0.1%

Other insider directors, 12, 0.1%

Independent directors, 242, 1.3%

Other outsider directors, 7846, 41.7%
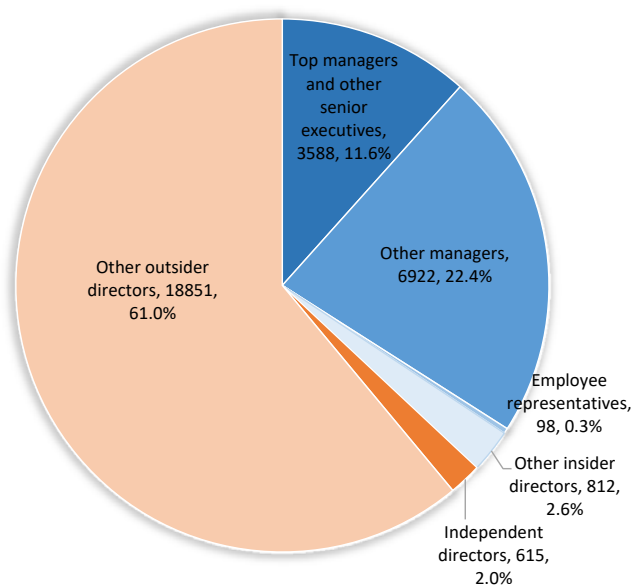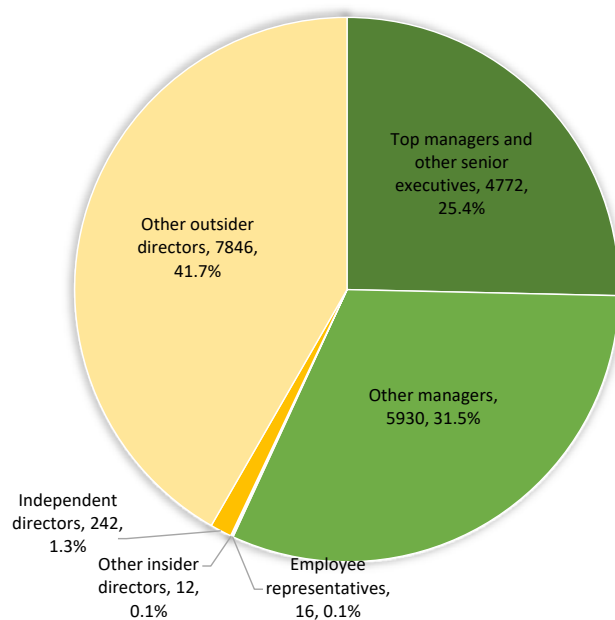
(d) European private companies (25,843 firms)

Top managers and other senior executives, 41990, 27.4%

Other managers, 23359, 15.3%

Employee representatives, 7848, 5.1%

Other insider directors, 10617, 6.9%

Independent directors, 624, 0.4%

Other outsider directors, 68532, 44.8%
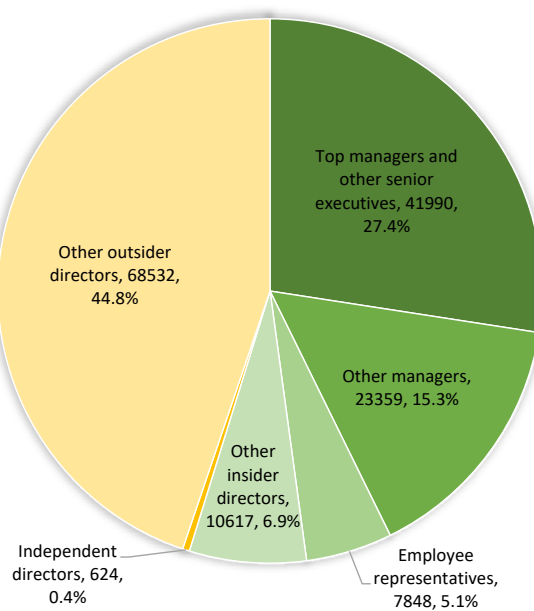
Note: Figures represent the total number of directors in each individual category and its percentage of all directors.

Source: Authors' illustrations based on the Orbis Database

Figure 2. Board size of 42,146 emerging market firms
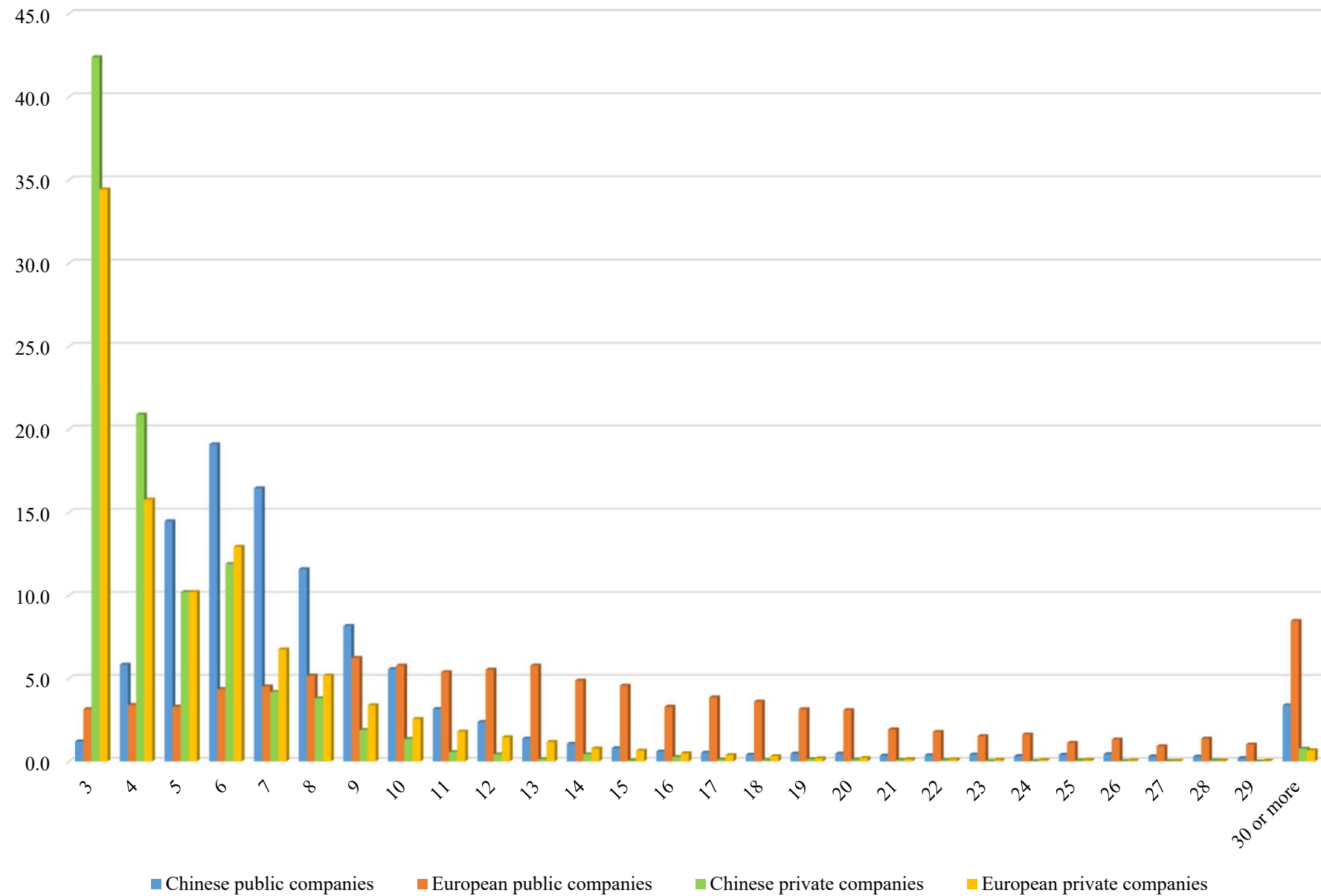
Note: Horizontal axis: total number of directors; vertical axis: percentage of sample firms (%)

Source: Authors' illustration based on the Orbis Database

Figure 3. Appointment route of board chairmen in 42,146 emerging market firms

Chinese public companies
- Appointment within the company, 1022
- Appointment outside the company, 9551

European public companies
- Appointment within the company, 169
- Appointment outside the company, 1804

Chinese private companies
- Appointment within the company, 1354
- Appointment outside the company, 2403

European private companies
- Appointment within the company, 19572
- Appointment outside the company, 6271

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Note: Figures show the number of appointees.

Source: Authors' illustration based on the Orbis Database

Figure 4. Board independence in 42,146 emerging market firms
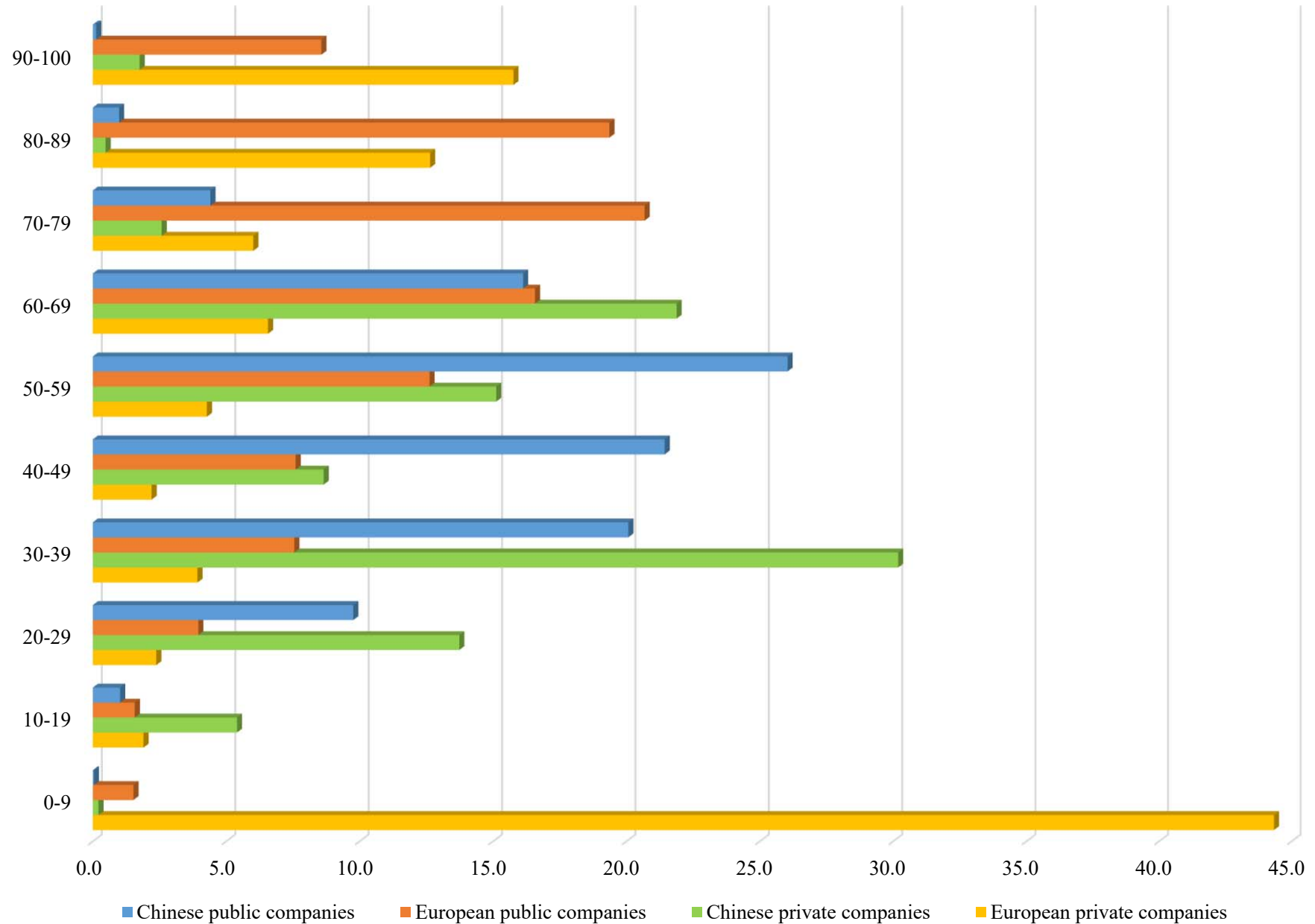
Note: Horizontal axis: percentage of sample firms (%); vertical axis: proportion of outside/independent directors (%)

Source: Authors' illustration based on the Orbis Database

Table 4. Correlation matrix of board structure variables of 42,146 emerging market firms

	Chinese public companies			European public companies			Chinese private companies			European private companies		
	[1]	[2]	[3]	[1]	[2]	[3]	[1]	[2]	[3]	[1]	[2]	[3]
[1] Board size	1.000			1.000			1.000			1.000		
[2] Outside board chairmanship	0.097 ***	1.000		0.157 ***	1.000		0.164 ***	1.000		0.159 ***	1.000	
[3] Board independence	0.056 ***	0.281 ***	1.000	-0.102 ***	0.225 ***	1.000	-0.058 ***	0.547 ***	1.000	0.128 ***	0.568 ***	1.000

Notes: The definition of each variable conforms to that in Table 3. *** denotes statistical significance at the 1% level.

Source: Authors' calculations based on the Orbis Database

Table 5. Reduced-form estimation of the board size model

Estimator	Poisson			
Target sample firms	Chinese public companies	European public companies	Chinese private companies	European private companies
Model	[1]	[2]	[3]	[4]
Bargaining variables				
Managerial independence	0.01838 ***	0.00317	-0.02912 *	-0.01936 ***
	(0.0029)	(0.0053)	(0.0163)	(0.0025)
Ownership concentration	-0.37645 ***	-0.28592 ***	0.00944	-0.07875 ***
	(0.0237)	(0.0787)	(0.0760)	(0.0166)
Affiliation with a business group	0.12022 ***	0.07037	-0.00283	0.12555 ***
	(0.0150)	(0.0505)	(0.1055)	(0.0145)
State onwership	0.46311 ***	0.30580 ***	0.05567	0.26156 ***
	(0.0579)	(0.0536)	(0.1261)	(0.0219)
Foreign ownership	0.08656	0.16713 ***	-0.00773	0.09472 ***
	(0.0891)	(0.0437)	(0.0621)	(0.0158)
Other governance variables				
Firm size	0.03845 ***	0.05734 ***	-0.00066	0.01814 ***
	(0.0032)	(0.0067)	(0.0079)	(0.0025)
Firm age	0.00152	0.00078 **	0.01334 ***	0.00347 ***
	(0.0013)	(0.0004)	(0.0040)	(0.0003)
Divisionalized organization	0.03699 ***	0.01538 *	0.20329 **	0.01041 ***
	(0.0118)	(0.0089)	(0.0805)	(0.0017)
Business-activity variables				
Innovativeness	0.04363 ***	0.10057 ***	0.10897 ***	0.10793 ***
	(0.0053)	(0.0169)	(0.0266)	(0.0175)
Sound financial performance	-0.00005	-0.00218 **	0.00103	-0.00148 ***
	(0.0007)	(0.0011)	(0.0023)	(0.0005)
Solvency	-0.00076 *	-0.00166 ***	-0.00219 **	-0.00051 ***
	(0.0004)	(0.0006)	(0.0011)	(0.0002)
Board structure variables				
Outside board chairmanship	0.40645 ***	0.41160 ***	0.40994 ***	0.38519 ***
	(0.0187)	(0.0558)	(0.0406)	(0.0172)
Board independence	-0.00407 ***	-0.00474 ***	-0.00639 ***	-0.00023
	(0.0007)	(0.0008)	(0.0022)	(0.0002)
Const.	1.39619 ***	2.11773 ***	1.37127 ***	1.35433 ***
	(0.0534)	(0.1278)	(0.1843)	(0.0433)
Industry fixed effect	Yes	Yes	Yes	Yes
Country fixed effect	No	Yes	No	Yes
N	10067	1730	1783	23237
Log pseudolikelihood	-32759.09	-7177.94	-4626.47	-58067.12
Pseudo R^2	0.1446	0.2379	0.1869	0.1544
Wald test (χ^2)	2740.53 ***	945.97 ***	647.62 ***	11081.17 ***

Notes: Figures in parentheses are robust standard errors. The Wald test examines the null hypothesis that all regression coefficients are zero. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Source: Authors' estimations. Table 3 provides detailed definitions and descriptive statistics of the variables used in estimations.

Table 6. Reduced-form estimation of the outside board chairmanship model

Estimator	Logit			
Target sample firms	Chinese public companies	European public companies	Chinese private companies	European private companies
Model	[1]	[2]	[3]	[4]
Bargaining variables				
Managerial independence	-0.00986	0.01461	0.05744	0.02397 *
	(0.0155)	(0.0492)	(0.0698)	(0.0124)
Ownership concentration	5.22297 ***	-1.06759 ***	1.15577 ***	0.01401
	(0.4560)	(0.3967)	(0.3240)	(0.0799)
Affiliation with a business group	-0.45234 ***	0.06072	0.01373	-0.18214 **
	(0.1253)	(0.3838)	(0.4082)	(0.0743)
State onwership	1.57469 ***	-0.25800	0.31251	-0.48920 ***
	(0.5402)	(0.3727)	(0.4936)	(0.0804)
Foreign ownership	0.13152	-0.40690	0.89788 ***	-0.23001 ***
	(0.5210)	(0.3089)	(0.2255)	(0.0662)
Other governance variables				
Firm size	-0.15126 ***	-0.05573	-0.04993	0.02119 **
	(0.0166)	(0.0419)	(0.0385)	(0.0105)
Firm age	-0.00575	0.00571 *	-0.00526	0.01170 ***
	(0.0077)	(0.0030)	(0.0138)	(0.0012)
Divisionalized organization	0.09253	0.14572 ***	-0.49764	0.02431 ***
	(0.0666)	(0.0418)	(0.3382)	(0.0077)
Business-activity variables				
Innovativeness	-0.04833 *	-0.15491	-0.08409	0.15643 ***
	(0.0260)	(0.1501)	(0.0687)	(0.0438)
Sound financial performance	-0.00394	0.00626	-0.01539	0.00161
	(0.0035)	(0.0104)	(0.0106)	(0.0020)
Solvency	-0.00309	0.00167	-0.00990 **	-0.00016
	(0.0025)	(0.0040)	(0.0045)	(0.0009)
Board structure variables				
Board size	0.54380 ***	0.11112 ***	1.47754 ***	0.17234 ***
	(0.0470)	(0.0209)	(0.1411)	(0.0144)
Board independence	0.16632 ***	0.03750 ***	0.22639 ***	0.04367 ***
	(0.0085)	(0.0057)	(0.0165)	(0.0009)
Const.	-6.88388 ***	-0.62676	-15.56880 ***	-6.58733 ***
	(0.6522)	(0.8097)	(1.4359)	(0.2203)
Industry fixed effect	Yes	Yes	Yes	Yes
Country fixed effect	No	Yes	No	Yes
N	10067	1730	1783	23237
Log pseudolikelihood	-1974.09	-343.83	-384.12	-6136.28
Pseudo R^2	0.3823	0.2577	0.6638	0.5250
Wald test (χ^2)	651.40 ***	166.38 ***	412.23 ***	5675.72 ***

Notes: Figures in parentheses are robust standard errors. The Wald test examines the null hypothesis that all regression coefficients are zero. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Source: Authors' estimations. Table 3 provides detailed definitions and descriptive statistics of the variables used in estimations.

Table 7. Reduced-form estimation of the board independence model

Estimator	Tobit			
Target sample firms	Chinese public companies	European public companies	Chinese private companies	European private companies
Model	[1]	[2]	[3]	[4]
Bargaining variables				
Managerial independence	-0.12718 **	0.15324	-0.08590	-1.54474 ***
	(0.0550)	(0.1744)	(0.2657)	(0.2169)
Ownership concentration	-3.28995 ***	1.79184	-0.85440	8.33621 ***
	(0.5797)	(1.9525)	(1.1740)	(1.3421)
Affiliation with a business group	-0.89782 **	-0.88694	-3.23735 *	-3.86696 ***
	(0.3625)	(1.4493)	(1.8737)	(1.2174)
State onwership	4.55211 ***	6.54028 ***	0.06685	5.86053 ***
	(1.0605)	(1.6504)	(2.2886)	(1.2482)
Foreign ownership	3.63088 *	1.08204	-0.57942	-9.71605 ***
	(1.9061)	(1.3218)	(0.9126)	(1.1696)
Other governance variables				
Firm size	0.54405 ***	-0.11640	0.37643 **	1.55740 ***
	(0.0623)	(0.2264)	(0.1627)	(0.1845)
Firm age	0.01967	-0.01374	-0.05752	0.11000 ***
	(0.0246)	(0.0115)	(0.0662)	(0.0212)
Divisionalized organization	0.35094 *	0.29911	3.58366 *	0.74839 ***
	(0.2097)	(0.2703)	(1.9374)	(0.1276)
Business-activity variables				
Innovativeness	0.07657	-0.87969 **	0.55842 *	-1.15016
	(0.0922)	(0.4459)	(0.3242)	(0.8526)
Sound financial performance	-0.00240	-0.02014	-0.00977	-0.32745 ***
	(0.0115)	(0.0322)	(0.0407)	(0.0337)
Solvency	-0.02419 ***	-0.01007	-0.03772 **	-0.09260 ***
	(0.0076)	(0.0169)	(0.0174)	(0.0148)
Board structure variables				
Board size	-0.14548 ***	-0.25580 ***	-0.38239 **	0.00860
	(0.0297)	(0.0463)	(0.1809)	(0.0762)
Outside board chairmanship	14.04424 ***	13.55350 ***	22.61864 ***	65.99289 ***
	(0.3936)	(2.3819)	(0.7097)	(1.1794)
Const.	31.12896 ***	53.07029 ***	32.59083 ***	2.88189
	(1.0061)	(3.6626)	(3.4632)	(3.0103)
Industry fixed effect	Yes	Yes	Yes	Yes
Country fixed effect	No	Yes	No	Yes
N	10067	1730	1783	23237
Log pseudolikelihood	-40041.67	-7136.79	-7334.39	-58050.71
Pseudo R^2	0.0155	0.0561	0.0470	0.1510
F test	61.57 ***	25.98 ***	45.05 ***	268.73 ***

Notes: Figures in parentheses are robust standard errors. The F test examines the null hypothesis that all regression coefficients are zero. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Source: Authors' estimations. Table 3 provides detailed definitions and descriptive statistics of the variables used in estimations.

Table 8. Structural estimation of the endogenous board structure model

Estimator	3 SLS			2SLS			3SLS			2SLS		
Target sample firms	Chinese public companies			European public companies			Chinese private companies			European private companies		
Model	[1]			[2]			[3]			[4]		
Dependent variable	Board size	Outside board chairmanship	Board independence	Board size	Outside board chairmanship	Board independence	Board size	Outside board chairmanship	Board independence	Board size	Outside board chairmanship	Board independence
Bargaining variables												
Managerial independence	0.00346		-0.00380 ***				-0.00706 *			-0.01702 ***	-0.00039	-0.00263
	(0.0047)		(0.0013)				(0.0042)			(0.0017)	(0.0009)	(0.0026)
Ownership concentration	-0.67950 ***	0.15745 ***	-0.09518	-0.29524 **	-0.08170 ***			0.00506		-0.12301 ***		0.04399 ***
	(0.1446)	(0.0138)	(0.0639)	(0.1476)	(0.0175)			(0.0174)		(0.0108)		(0.0167)
Affiliation with a business group	0.07717 ***	-0.01226 *	-0.02140 *						-0.03640	0.12523 ***	-0.00225	-0.02936 **
	(0.0252)	(0.0064)	(0.0114)						(0.0248)	(0.0093)	(0.0050)	(0.0146)
State onwership	0.19073 *	0.05183 **	0.07304	0.37570 ***		0.14862 **				0.24262 ***	-0.03743 ***	-0.00245
	(0.1049)	(0.0239)	(0.0452)	(0.1044)		(0.0750)				(0.0126)	(0.0067)	(0.0205)
Foreign ownership			0.04665	0.13889				0.07385 ***		0.06846 ***	0.01428 ***	-0.14138 ***
			(0.0329)	(0.0855)				(0.0155)		(0.0088)	(0.0046)	(0.0130)
Other governance variables												
Firm size	0.06996 ***	-0.01678	0.01356 **	0.02793 **					0.00549 *	0.01046 ***	0.00727 ***	0.01807 ***
	(0.0188)	(0.0159)	(0.0066)	(0.0123)					(0.0032)	(0.0013)	(0.0007)	(0.0020)
Firm age				-0.00070	0.00020 *		0.00885 ***			0.00251 ***	0.00092 ***	0.00210 ***
				(0.0008)	(0.0001)		(0.0017)			(0.0002)	(0.0001)	(0.0003)
Divisionalized organization	-0.00185		0.00335	0.06257 ***	0.01219 ***		0.13836 ***		0.05360 *	0.01377 ***	0.00397 ***	-0.00031
	(0.0115)		(0.0062)	(0.0203)	(0.0023)		(0.0372)		(0.0280)	(0.0007)	(0.0004)	(0.0012)
Business-activity variables												
Innovativeness	0.02735 ***	-0.00583 ***		0.09964 ***		-0.01390	0.04623 ***		-0.00454	0.09060 ***	0.02356 ***	
	(0.0057)	(0.0013)		(0.0340)		(0.0249)	(0.0062)		(0.0087)	(0.0069)	(0.0036)	
Sound financial performance				0.00105						-0.00176 ***		-0.00378 ***
				(0.0022)						(0.0003)		(0.0005)
Solvency	0.00047		-0.00046 *	-0.00081			-0.00108 **	-0.00099 ***	-0.00036	-0.00095 ***		-0.00169 ***
	(0.0004)		(0.0003)	(0.0011)			(0.0005)	(0.0003)	(0.0003)	(0.0001)		(0.0002)
Board structure variables (endogenous variables)												
Board size		0.20914 ***	-0.00771		0.05652 ***	-0.36068 ***		0.26574 ***	0.06106		0.00518	0.69507 ***
		(0.0285)	(0.0641)		(0.0126)	(0.0740)		(0.0499)	(0.1263)		(0.0107)	(0.0278)
Outside board chairmanship	4.27861 ***		0.68808	6.26035 ***		3.45651 ***	0.81029 ***		0.35091 **	-0.05000		1.64340 ***
	(1.5386)		(0.6121)	(0.9943)		(0.4162)	(0.2001)		(0.1653)	(0.0386)		(0.0452)
Board independence	-1.49396 *	0.47983 ***		-0.50497 ***	0.07115 ***		-0.11232	0.35726 *		0.34962 ***	0.23290 ***	
	(0.8716)	(0.1182)		(0.1158)	(0.0140)		(0.3866)	(0.1858)		(0.0128)	(0.0058)	
Const.	-0.40626	0.05159	0.16113	-1.28446 **	0.42804 ***	-0.15609	1.02734 ***	-0.23227 **	0.36235 **	1.38453 ***	-0.14547 ***	-0.47653 ***
	(0.7940)	(0.0829)	(0.3677)	(0.6174)	(0.0398)	(0.2355)	(0.2087)	(0.1061)	(0.1520)	(0.0252)	(0.0182)	(0.0571)
Industry fixed effect	Yes			Yes			Yes			Yes		
Country fixed effect	No			Yes			No			Yes		
N	10063	10063	10063	1681	1681	1681	1743	1743	1743	19696	19696	19696
RMSE	0.87	0.21	0.28	1.17	0.18	0.79	0.43	0.26	0.31	0.53	0.26	0.86
Adjusted R^2	0.7619	0.0364	0.0482	0.3225	0.1200	0.6404	0.2149	0.3781	0.2078	0.0111	0.1588	0.4278
F/Wald test (χ^2)	1118.29 ***	390.11 ***	448.15 ***	5.57 ***	8.72 ***	6.67 ***	615.14 ***	164.30 ***	69.62 ***	9924.60 ***	8377.71 ***	16410.70 ***
Hausman test (χ^2)	4.74			637.55 ***			42.64			563.48 ***		

Notes: Figures in parentheses are robust standard errors. The F/Wald test examines the null hypothesis that all regression coefficients are zero. The Hausman test examines the null hypothesis that 3SLS estimations are consistent. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Source: Authors' estimations. Table 3 provides detailed definitions and descriptive statistics of the variables used in estimations.

Table 9. Results of hypothesis testing based on estimation results of the endogenous board structure model

Predicted sign and estimation results of independent variable	Board size — Predicted sign	Board size — Chinese public companies	Board size — European public companies	Board size — Chinese private companies	Board size — European private companies	Outside board chairmanship — Predicted sign	OBC — Chinese public companies	OBC — European public companies	OBC — Chinese private companies	OBC — European private companies	Board independence — Predicted sign	BI — Chinese public companies	BI — European public companies	BI — Chinese private companies	BI — European private companies
Bargaining variables															
Managerial independence	−			−	−	−					−	−	−		
Ownership concentration	−	−	−		−	+	+	(−)			+				+
Affiliation with a business group	+	+			+	−	−				−	−			−
State ownership	+	+	+		+	+	+			(−)	+			+	
Foreign ownership	+				+	+			+	+	+				(−)
Other governance variables															
Firm size	+	+	+		+	+				+	+	+	+	+	+
Firm age	+			+	+	+		+		+	+				+
Divisionalized organization	+		+	+	+	?		+		+	?			+	
Business-activity variables															
Innovativeness	+	+	+	+	+	−	−			(+)	−				
Sound financial performance	?				−	−					−				−
Solvency	?			−	−	−			−		−	−			−
Board structure variables (endogenous variables)															
Board size						+	+	+	+	+	+			(−)	+
Outside board chairmanship	+	+	+	+							+		+	+	+
Board independence	+	(−)	(−)		+	+	+	+	+	+					

Note: The symbols in the cells indicating the empirical results denote the following. +/-: the estimation result is statistically significantly positive/negative in agreement with the theoretical prediction; (+)/(-): the estimation result is significantly positive/negative contrary to the theoretical prediction; blank: the estimation result is insignificant.

Source: Tables 1 and 8

Appendix Table A1. Composition of sample firms and board structure by country and in all 22 emerging markets

	Asia	Central Europe					Eastern Europe and the Baltics					Southern Europe							Former Soviet Union				All 22 emerging markets
	China	Czech Republic	Hungary	Poland	Slovakia	Slovenia	Bulgaria	Romania	Estonia	Latvia	Lithuania	Croatia	Serbia	Albania	Montenegro	North Macedonia	Bosnia-Herzegovina	Kosovo	Moldova	Belarus	Ukraine	Russia	
(a) Composition of sample firms																							
Total number	14,330	1,816	2,706	4,045	1,080	564	1,637	3,617	727	713	711	1,003	786	49	89	78	317	63	168	378	159	7,110	42,146
Public companies	10,573	11	13	392	30	24	69	184	15	13	23	116	163	0	36	67	139	0	93	0	103	482	12,546
Private companies	3,757	1,805	2,693	3,653	1,050	540	1,568	3,433	712	700	688	887	623	49	53	11	178	63	75	378	56	6,628	29,600
Agriculture, forestry, and fisheries	221	231	186	38	95	7	61	106	13	40	48	25	35	0	0	3	6	1	5	55	3	600	1779
Mining and manufacturing	8,958	821	1,193	1,935	476	289	702	1,800	327	233	248	433	401	3	27	43	151	31	82	226	108	3,395	21,882
Construction	197	109	122	266	71	29	119	278	38	62	92	87	68	4	6	2	28	2	17	36	2	480	2115
Services	4,954	655	1,205	1,806	438	239	755	1,433	349	378	323	458	282	42	56	30	132	29	64	61	46	2,635	16,370
Firms with less than 100 employees	2,514	784	1,005	1,260	446	219	670	1,168	369	319	323	308	276	2	32	20	90	20	57	28	21	1,965	11,896
Firms with from 100 to 499 employees	6,357	834	1,286	2,022	491	268	741	1,848	305	329	317	524	374	29	46	46	176	35	84	207	46	3,397	19,762
Firms with from 500 to 999 employees	1,697	116	218	371	88	46	134	335	35	41	40	93	63	9	8	7	26	4	13	82	32	877	4,335
Firms with 1000 or more employees	3,762	82	197	392	55	31	92	266	18	24	31	78	73	9	3	5	25	4	14	61	60	871	6,153
(b) Board size																							
Mean	8.096	4.317	7.929	4.959	4.384	5.986	4.695	6.407	5.867	5.457	5.276	6.313	7.780	9.265	9.045	12.244	6.997	5.413	8.488	3.352	9.881	8.740	7.115
Median	6	3	5	3	3	4	3	5	5	4	4	6	6	5	6	9	5	4	7	3	7	7	6
S.D.	7.217	3.763	11.106	4.851	3.032	6.151	4.477	6.469	5.146	4.774	5.689	5.716	6.193	10.420	8.018	11.182	6.039	4.747	5.114	2.052	10.153	6.112	6.824
(c) Outside board chairmanship																							
Mean	0.834	0.611	0.040	0.103	0.570	0.397	0.162	0.103	0.558	0.902	0.075	0.864	0.636	0.184	0.708	0.821	0.476	0.429	0.589	0.095	0.818	0.269	0.475
Median	1	1	0	0	1	0	0	0	1	1	0	1	1	0	1	1	0	0	1	0	1	0	0
S.D.	0.372	0.488	0.196	0.304	0.495	0.490	0.369	0.303	0.497	0.298	0.263	0.343	0.481	0.391	0.457	0.386	0.500	0.499	0.493	0.294	0.387	0.444	0.499
(d) Board independence																							
Mean	45.71	62.51	37.19	7.85	58.14	41.30	48.69	10.89	98.94	99.19	15.83	70.82	59.40	68.78	71.51	63.99	43.92	46.80	60.08	4.96	38.02	56.09	43.33
Median	43	100	38	0	100	43	67	0	100	100	0	80	75	75	75	75	50	33	79	0	33	69	43
S.D.	15.202	47.946	36.143	22.313	48.817	41.043	32.827	17.778	6.858	5.204	30.094	27.017	34.027	20.364	21.370	30.662	33.747	35.948	35.811	16.210	26.245	32.055	33.749

Source: Authors' calculations based on the Orbis Database

Appendix Table A2. Correlation matrix of the variables used in the empirical analysis

(a) Chinese public companies

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]
[1] Managerial independence	1.000										
[2] Ownership concentration	-0.478	1.000									
[3] Affiliation with a business group	-0.012	-0.391	1.000								
[4] State onwership	-0.160	-0.077	0.083	1.000							
[5] Foreign ownership	-0.082	-0.004	0.039	-0.012	1.000						
[6] Firm size	0.290	-0.356	0.293	0.212	0.041	1.000					
[7] Firm age	0.208	-0.236	0.200	0.096	0.013	0.409	1.000				
[8] Divisionalized organization	0.149	-0.132	0.110	0.058	-0.005	0.188	0.224	1.000			
[9] Innovativeness	0.202	-0.237	0.175	0.138	0.008	0.405	0.278	0.078	1.000		
[10] Sound financial performance	0.049	-0.071	0.024	-0.008	0.007	0.171	0.030	0.031	0.005	1.000	
[11] Solvency	0.115	-0.082	-0.010	-0.108	-0.004	-0.125	-0.072	-0.066	0.017	0.313	1.000

(b) European public companies

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]
[1] Managerial independence	1.000										
[2] Ownership concentration	-0.358	1.000									
[3] Affiliation with a business group	-0.391	0.035	1.000								
[4] State onwership	-0.244	0.010	0.126	1.000							
[5] Foreign ownership	-0.323	0.126	0.164	-0.089	1.000						
[6] Firm size	-0.110	0.086	0.212	0.077	0.150	1.000					
[7] Firm age	0.002	-0.072	-0.024	0.006	0.030	-0.110	1.000				
[8] Divisionalized organization	-0.015	0.108	0.000	-0.030	0.063	0.240	-0.094	1.000			
[9] Innovativeness	0.037	-0.074	0.075	0.061	-0.001	0.050	0.106	-0.004	1.000		
[10] Sound financial performance	0.006	-0.014	0.047	0.049	0.050	0.136	-0.086	0.065	0.030	1.000	
[11] Solvency	0.007	-0.032	-0.050	0.038	-0.093	-0.082	-0.003	-0.160	0.007	0.218	1.000

(c) Chinese private companies

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]
[1] Managerial independence	1.000										
[2] Ownership concentration	-0.476	1.000									
[3] Affiliation with a business group	-0.639	0.295	1.000								
[4] State onwership	-0.114	0.091	0.096	1.000							
[5] Foreign ownership	-0.204	0.125	0.160	-0.107	1.000						
[6] Firm size	0.042	-0.023	-0.009	0.012	-0.065	1.000					
[7] Firm age	0.021	-0.032	0.057	0.183	0.027	-0.015	1.000				
[8] Divisionalized organization	0.272	-0.117	-0.132	-0.014	-0.033	0.032	0.042	1.000			
[9] Innovativeness	-0.010	0.001	0.038	0.133	0.022	-0.022	0.230	-0.038	1.000		
[10] Sound financial performance	0.161	-0.098	-0.097	-0.062	0.022	0.018	0.090	0.403	0.031	1.000	
[11] Solvency	-0.060	0.043	0.010	-0.069	0.048	0.049	0.059	-0.210	0.014	0.236	1.000

(d) European private companies

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]
[1] Managerial independence	1.000										
[2] Ownership concentration	-0.387	1.000									
[3] Affiliation with a business group	-0.467	0.137	1.000								
[4] State onwership	-0.129	0.166	0.133	1.000							
[5] Foreign ownership	-0.270	0.073	0.359	-0.157	1.000						
[6] Firm size	-0.065	0.049	0.100	-0.047	0.184	1.000					
[7] Firm age	0.061	-0.069	-0.012	0.037	-0.121	-0.058	1.000				
[8] Divisionalized organization	-0.078	0.064	-0.094	0.001	-0.149	-0.494	0.051	1.000			
[9] Innovativeness	0.008	0.002	0.031	0.011	-0.027	0.005	0.118	0.041	1.000		
[10] Sound financial performance	0.003	-0.038	0.001	-0.056	0.035	0.025	-0.005	-0.010	0.022	1.000	
[11] Solvency	0.047	-0.025	-0.069	0.042	-0.075	0.052	0.102	0.021	0.046	0.297	1.000

Source: Authors' calculations based on the Orbis Database

Appendix Table A3. Univariate comparison between Chinese listed companies and OTC companies

Variable name	Chinese listed companies			Chinese OTC companies		
	Mean	Median	S.D.	Mean	Median	S.D.
Dependent variables						
Board size	12.995	8	11.267	7.118	6	2.873
Outside board chairmanship	0.865	1	0.342	0.924	1	0.264
Board independence	48.005	47.402	14.418	45.412	42.857	13.459
Independent variables						
Managerial independence	4.885	5	2.652	2.619	0	2.885
Ownership concentration	0.075	0.059	0.108	0.304	0.167	0.322
Affiliation with a business group	0.956	1	0.205	0.694	1	0.461
State ownership	0.062	0	0.241	0.004	0	0.066
Foreign ownership	0.008	0	0.088	0.005	0	0.067
Firm size	14.120	13.478	2.440	9.962	9.815	1.479
Firm age	21.374	21	6.452	14.930	15	5.056
Divisionalized organization	1.499	1	0.963	1.084	1	0.385
Innovativeness	1.826	0.693	2.295	0.247	0.000	0.873
Sound financial performance	12.053	10.567	13.450	8.305	7.815	12.817
Solvency	56.949	58.790	20.385	57.041	57.507	19.121

Notes: Table 3 provides detailed definitions of the variables.

Appendix Table A4. Determinants of board structure: Chinese listed companies versus OTC companies

Target sample firms	Chinese listed companies						Chinese OTC companies					
Estimator	Poisson	Logit	Tobit	3SLS			Poisson	Logit	Tobit	3SLS		
Model	[1]	[2]	[3]	[4]			[5]	[6]	[7]	[8]		
Dependent variable	Board size	Outside board chairmanship	Board independence	Board size	Outside board chairmanship	Board independence	Board size	Outside board chairmanship	Board independence	Board size	Outside board chairmanship	Board independence
Bargaining variables												
Managerial independence	0.01179 **	0.02772	-0.16444 *	0.00790 *		-0.00373	0.00681 ***	-0.00463	-0.01519	0.00563 ***		
	(0.0058)	(0.0236)	(0.0949)	(0.0041)		(0.0026)	(0.0019)	(0.0217)	(0.0645)	(0.0020)		
Ownership concentration	0.22240	4.73772 ***	-0.32680		0.09141 *		-0.34803 ***	4.75943 ***	-6.60535 ***	-0.37160 ***	0.19015 ***	-0.15752 ***
	(0.1565)	(1.1495)	(3.9816)		(0.0483)		(0.0155)	(0.4044)	(0.6471)	(0.0456)	(0.0454)	(0.0343)
Affiliation with a business group	0.11710 *	-0.23255	-1.62162	0.09084 *			0.05628 ***	-0.35300 **	0.06082	0.04720 ***	-0.00896	
	(0.0681)	(0.2803)	(1.3009)	(0.0487)			(0.0097)	(0.1481)	(0.3673)	(0.0120)	(0.0055)	
State ownership	0.37845 ***	1.34767 **	3.12129 ***	0.23569 ***	0.00804	0.09118 **	0.01073		-0.61663			
	(0.0659)	(0.5495)	(1.1467)	(0.0908)	(0.0387)	(0.0369)	(0.0659)		(2.3229)			
Foreign ownership	0.09524	-0.16302	3.12341				0.01446	1.14080	3.41512			
	(0.1326)	(0.5844)	(2.4622)				(0.0591)	(1.1304)	(2.6769)			
Other governance variables												
Firm size	-0.00411	-0.04207 *	0.50952 ***		-0.00224	0.01153 ***	0.01256 ***	-0.23943 ***	0.18133	0.01047	-0.00987 ***	
	(0.0050)	(0.0223)	(0.0947)		(0.0028)	(0.0025)	(0.0036)	(0.0385)	(0.1238)	(0.0070)	(0.0021)	
Firm age	-0.00659 **	0.01587 *	0.06414	-0.00833 ***	0.00254 ***		0.00152 *	-0.00700	-0.02974	0.00171 **		
	(0.0027)	(0.0090)	(0.0416)	(0.0020)	(0.0007)		(0.0008)	(0.0109)	(0.0293)	(0.0008)		
Divisionalized organization	0.00401	0.16611 **	0.14290		0.00671 *		-0.00958	0.11798	-0.61513			
	(0.0140)	(0.0782)	(0.2467)		(0.0040)		(0.0106)	(0.1678)	(0.4173)			
Business-activity variables												
Innovativeness	0.03789 ***	-0.01786	0.02788	0.02228 ***			0.02679 ***	-0.17782 ***	0.36653 *	0.02501 ***	-0.00964 ***	0.00586
	(0.0065)	(0.0288)	(0.1091)	(0.0049)			(0.0069)	(0.0563)	(0.1935)	(0.0048)	(0.0037)	(0.0044)
Sound financial performance	-0.00141	-0.00725	0.02299				-0.00021	0.00710	-0.01233			
	(0.0013)	(0.0049)	(0.0210)				(0.0003)	(0.0048)	(0.0127)			
Solvency	-0.00192 **	-0.00681 *	-0.06205 ***	0.00018	-0.00060	-0.00106 ***	0.00028	-0.00004	0.00176			
	(0.0008)	(0.0036)	(0.0136)	(0.0011)	(0.0004)	(0.0004)	(0.0002)	(0.0035)	(0.0088)			
Board structure variables												
Board size		0.52734 ***	0.05211 *		0.18668 ***	-0.04072		0.57703 ***	1.88845 ***		0.33440 ***	0.32186 ***
		(0.0914)	(0.0284)		(0.0457)	(0.0658)		(0.0408)	(0.1521)		(0.1231)	(0.0983)
Outside board chairmanship	0.52865 ***		11.55472 ***	2.01365 ***		0.55898 **	0.27385 ***		16.47634 ***	0.82641		
	(0.0303)		(0.5789)	(0.4939)		(0.2588)	(0.0149)		(0.4692)	(0.5234)		
Board independence	0.00214 *	0.15312 ***		-0.20066	-0.01718		-0.01122 ***	0.18184 ***		-0.78952 *	0.74651 ***	0.43107 ***
	(0.0012)	(0.0135)		(0.4282)	(0.2483)		(0.0004)	(0.0099)		(0.2477)	(0.1679)	
Const.	1.91781 ***	-8.66716 ***	33.30750 ***	1.20445 **	0.17002	0.35011 *	2.08880 ***	-7.02073 ***	44.92987 ***	1.81329 ***	-0.43135	1.02551 ***
	(0.1325)	(1.2420)	(2.4022)	(0.4945)	(0.1788)	(0.1893)	(0.0486)	(0.7893)	(1.7894)	(0.4155)	(0.3793)	(0.2484)
Industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3522	3465	3522	3520	3520	3520	6545	6473	6545	6543	6543	6543
Log pseudolikelihood/RMSE	-16944.82	-856.44	-14048.59	0.65	0.23	0.31	-14417.76	-1062.12	-25428.87	0.31	0.22	0.24
Pseudo R^2/Adjusted R^2	0.1130	0.3911	0.0220	0.1292	0.0411	0.1234	0.0576	0.3836	0.0317	0.1617	0.4216	0.2043
F/Wald test (χ^2)	863.82 ***	212.55 ***	31.29 ***	303.61 ***	111.61 ***	389.30 ***	2262.42 ***	458.00 ***	51.84 ***	1211.27 ***	230.76 ***	46.06 ***
Hausman test (χ^2)	-	-	-	5.25			-	-	-	18.55		

Notes: Figures in parentheses are robust standard errors. The F/Wald test examines the null hypothesis that all regression coefficients are zero. The Hausman test examines the null hypothesis that 3SLS estimations are consistent. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Source: Authors' estimations. Table 3 provides detailed definitions and descriptive statistics of the variables used in estimations.