

Corporate Governance and Supplier Financing: Evidence from Global Board Reforms

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Abstract

Drawing on current literature and our simple external financing model, we hypothesize a negative relationship between internal governance quality and supplier financing. This relationship is expected to intensify among firms with weak internal governance, those in countries with strong external governance and financing mechanisms, and financially fragile firms facing increased financing needs, financial constraints, demand uncertainty, and competition. Using a decade of data surrounding governance-enhancing board reforms in 38 countries, our difference-in-differences analyses strongly support these predictions. Improved internal governance reduces reliance on supplier financing and payables manipulation for signaling and opportunistic purposes, leading to better investment decisions and firm performance.

Keywords: Trade credit, board reform, board independence, accounts payable manipulation, internal governance, country external governance, financial constraints, supply chain stability

JEL Classifications: G32, G34, G38

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1. Introduction

Trade credit is a prominently favored source of financing for firms. The U.S. Financial Accounts indicate that, in 2022, nonfinancial corporate entities reported \$3.44 trillion in trade payables, more than double their loans from depository institutions.¹ However, from a cost of capital perspective, trade credit can be inefficient. For example, the standard payment term of 2/10, net 30, translates to an effective annual interest rate of almost 45% if discounts are forgone (Smith, 1987; Cuñat, 2007).² Pecking order theory suggests that firms should exhaust internally generated funds and secure external debt before resorting to trade credit (Myers and Majluf, 1984; Petersen and Rajan, 1994; Atanasova, 2007). Nonetheless, firms continue to rely heavily on trade credit, incurring substantial costs by missing early payment discounts (Petersen and Rajan, 1997).

This observed preference prompts the question of why some firms' managers maintain excessive accounts payable. Since accounts payable often depend on strategic decisions and management practices within a firm, internal corporate governance may influence trade credit practices through working capital management. We use board reform shocks across 38 countries to examine how firm-level governance improvements affect trade credit use. Additionally, we investigate the mechanisms of external financing and signaling as the channels through which trade credit is influenced and whether country-level governance impacts the potency of the board reform measures.

¹ The Financial Accounts data are available at <https://www.federalreserve.gov/releases/z1/20231207/html/s5a.htm>. During our sample period from 1993 to 2012, accounts payable constitute on average a significant percentage of total assets for non-financial, non-utility firms: 17.8% in Italy, 16.9% in France, 16.0% in Japan, 14.7% in Canada, 14.5% in Belgium, 13.7% in Singapore, 13.1% in the United Kingdom, 11.4% in the Netherlands, and 10.8% in the United States. These proportions are consistently higher than the respective ratios of short-term debt to total assets, which are 13.2% in Italy, 8.9% in France, 14.6% in Japan, 8.4% in Canada, 9.2% in Belgium, 12.9% in Singapore, 7.7% in the United Kingdom, 8.4% in the Netherlands, and 7.9% in the United States.

² Giannetti et al. (2011) find that the actual maturity of trade credit is often longer than the contractual maturity, and almost half of their sample firms pay at least one of their bills after the due date.

Existing literature suggests that weak internal corporate governance, characterized by low board independence, insufficient board oversight, and CEO dominance, may render firms more susceptible to agency problems (Dey, 2008). More pronounced agency problems can lead to greater financial constraints (La Porta et al., 2000; Francis, 2011; Zhao and Shi, 2024). These constraints manifest as difficulties in securing external financing and diminished profits (Jensen and Meckling, 1976).³ Constrained firms may become credit rationed and resort more to trade credit as an alternative source of financing rather than other forms, such as bank loans or the issuance of new equity or debt (Choi and Kim, 2005; Atanasova, 2007; Murfin and Njoroge, 2015; Zhang, 2019). Therefore, firms with weak internal governance tend to rely on supplier financing due to its flexibility, absence of collateral requirements, and reduced market oversight.

We introduce a model that demonstrates how a firm's borrowing decisions, both regarding traditional sources of financing and trade credit from its suppliers, depend on corporate governance. The model also highlights the trade-off faced by a risk-averse manager between the benefits of fund diversion and the potential penalties, considering the monitoring effects of corporate governance. The model generates three key implications concerning the firm's external financing channel. First, stronger governance increases the equilibrium level of borrowing from traditional sources, thereby lowering reliance on supplier financing. This shift toward traditional financing occurs through 1) lower borrowing costs charged by traditional lenders and 2) a decrease in the equilibrium managerial diversion rate, which results from improved governance and monitoring. Second, stronger governance lowers the equilibrium managerial diversion rate, which in turn reduces the firm's demand for supplier financing to meet its target level of inputs for production. Lastly, stronger governance reduces the total borrowing costs from both traditional lenders and

³ In firms with weaker internal governance, creditors incur elevated monitoring costs, consequently demanding a higher premium (Ashbaugh-Skaife et al, 2006; Weber, 2006).

suppliers.

Given the inferences from the literature and our model, we pose and empirically examine the hypothesis that the level of firms' accounts payable is negatively related to the quality of their internal governance. However, examining the causality of internal governance quality on a firm's use of trade credit is challenging due to their endogenous relationship. The inherent endogeneity of internal governance quality and its potential links to variables that impact trade credit utilization presents identification challenges. Moreover, the use of trade credit can influence a firm's internal governance quality.⁴ To address these challenges, we employ board reform—an exogenous shock that improves internal governance and reduces agency costs—to identify internal governance's effect on a firm's use of trade credit.

Since the 1990s, many countries have launched board reforms aimed at enhancing board independence, strengthening audit committees and auditor independence, and clearly distinguishing the roles between the CEO and Chairman. The impact of board reform on improving internal governance is well-documented. The existing literature identifies that board reform decreases managerial information asymmetry, lowers stock price crash risk, enhances investment efficiency, and increases firm value (Fauver et al., 2017; Hu et al., 2020; Driss, 2022; Qiu and To, 2022). Such an apparent, exogenous country-level policy shock to the quality of internal governance enables us to use a staggered Difference-in-Differences (DID) approach to determine whether more robust internal governance causally leads firms to have lower accounts payable.

Using a sample of 157,704 firm-year observations from 28,472 unique firms from 38 countries during 1993–2012, we find that board reforms significantly reduce firms' use of accounts

⁴ Biais and Gollier (1997) show that the use of trade credit can alleviate the asymmetric information between banks and firms and incorporate the private information held by suppliers about their customers, helping to align interests and reduce agency problems. Aktas et al. (2012) find that the use of trade credit provides valuable information to outside investors and improves the quality of the firm's investments.

payable. This finding is robust across various alternative estimation methods, including the estimator by Callaway and Sant’Anna (2021), stacked regression, and dynamic DID. To further validate our baseline results, we conduct a placebo test, which reveals no similar reduction when board governance reform years are randomly assigned. We obtain similar results using alternative samples and measures of accounts payable. In addition, we separately examine the impact of the board reforms’ three components identified by Fauver et al. (2017)—namely, board independence, audit committee and auditor independence, and separation of the Chairman and CEO roles—on firms’ use of accounts payable. The results for each component are consistent with our baseline findings.

In additional analyses, we find that reductions in accounts payable following board reforms are more significant for firms with weaker internal governance (e.g., lower board independence and more significant agency costs) before the reforms. These results confirm that board reform policies are binding for their targeted firms. These findings also support our argument that accounts payable decrease because board reforms can curb the excessive use of accounts payable due to managerial opportunistic behaviors and working capital manipulation.

Next, we investigate how a country’s external financing environment influences the effect of positive shocks to internal governance on accounts payable. A favorable financing environment (e.g., more significant financial and stock market development) enables firms to decrease their reliance on accounts payable post-reform. Relatedly, we find that financially fragile firms with greater external financing needs and limited access to external finance reduce their reliance on accounts payable after reforms that mitigate credit market friction.

To provide further evidence of the external financing mechanism driving the reduction of accounts payable following reforms, we explore whether improved internal governance promotes

investment and improves operating performance. We observe that post-reform firms experience higher levels of capital, non-capital, and total investment, and the effect is more pronounced for financially fragile firms. This suggests that board reforms alleviate challenges associated with limited external funding. Additionally, we find an increase in return on assets post-reform, which is more significant for firms with higher agency costs and financially fragile firms. These findings indicate that by enhancing internal governance, board reform not only eases the limitation on accessing external financing but also boosts firms' profitability. Consequently, this reduces the overreliance on accounts payable, enabling firms to adopt a more cost-efficient financing structure.

Finally, we examine how external governance interacts with the effect of positive shocks to internal governance on accounts payable. Board reforms may be more effective in countries with external solid governance because these countries can more effectively police and enforce the reforms. Alternatively, reforms could be more effective in countries with weak external governance as the reforms substitute for lacking external controls. We identify a complementary relationship between external and internal governance, where external governance is proxied by country-level formal and informal institutions. This finding suggests that board reforms become more effective in reducing firms' excessive use of accounts payable in countries with external solid governance.

Our main contributions are threefold. First, this study enriches the literature on the determinants of trade credit (e.g., Petersen and Rajan, 1997; Ng et al., 1999; Niskanen and Niskanen, 2006; Ge and Qiu, 2007; Molina and Preve, 2012) by examining the impact of firms' internal governance quality on supplier financing both theoretically and empirically. Specifically, our study highlights an external financing channel in which improved internal governance reduces borrowing costs from traditional lenders and the managerial fund diversion rate, leading to cheaper

and greater amounts of debt from traditional lenders. We also empirically show that the reliance on supplier financing decreases significantly after reforms for firms with weak governance and financially fragile firms. Moreover, we find that the impact of reforms on the reduction of accounts payable is more substantial for firms in countries with well-developed financial and stock markets. This suggests that existing country-level institutions might amplify the benefits of improved internal governance from board reforms by facilitating firms' access to alternative and cost-effective financing via capital markets. Importantly, we employ a plausibly exogenous identification strategy to establish a non-spurious relationship and make valid causal inferences regarding global board reforms that address agency issues and credit rationing. Beyond reducing reliance on supplier financing, we also find that board reforms encourage firms to extend more credit to their customers. This evidence supports the idea that improved governance can enhance supply chain stability and aligns with Ersahin et al. (2024) who show that trade credit, when used strategically, can strengthen production networks during disruptions. Our analysis further reveals that post-reform, firms experience both increased investment levels and improved return on assets.

Second, our study contributes to the growing body of literature on the effects of board reforms. Research shows that board reforms can increase firm value (Fauver et al., 2017), dividend payouts (Bae et al., 2021), investment efficiency (Driss, 2022), stock liquidity (Qiu and To, 2022), and cross-listing activities (Liao et al., 2022a). Additionally, reforms are associated with decreased risk of stock price crashes (Hu et al., 2020), reduced cash holdings (Chen et al., 2020), lower underpricing of initial public offerings (Chen et al., 2022), and a decline in corporate tax avoidance (Li et al., 2023). We enrich this literature by providing new evidence of the impact of board reforms on trade credit. Our findings support that board reforms strengthen corporate governance through enhanced board oversight of management and by reducing information asymmetry and agency

problems. This, in turn, eases firms' financial constraints, improves resilience, and lessens their reliance on supplier financing (Biais and Gollier, 1997; Mateut and Chevapatrakul, 2018; Del Gaudio et al., 2022; Arca et al., 2023).

Finally, our study contributes to the ongoing debate over whether internal and external governance functions are substitutes or complements, a topic with significant policy implications. Earlier research supports the substitutional view, suggesting that board reforms are less effective in robust country-level governance mechanisms (Chen et al., 2020; Chen et al., 2022; Driss, 2022; Qiu and To, 2022). Contrarily, our findings reveal that a reduction in accounts payable following board reforms is more prominent for firms within robust legal and institutional frameworks typified by effective rule of law, contract enforcement, and social trust. This reinforces the complementary view, as argued by Bae et al. (2021), Ben-Nasr et al. (2021), and Dak-Adzaklo and Wong (2024), which posits that board reforms promote more effective board supervision within countries that have sound formal and informal institutions.

The remainder of the paper is organized as follows. Section 2 introduces a simple model of how governance, in the presence of agency costs, affects the firm's choice of borrowing levels between traditional lenders and trade credit. Section 3 reviews the relevant literature and develops the testable hypotheses. Section 4 details data sources, variable construction, and research methodology. Section 5 presents the empirical results, and Section 6 offers the conclusion.

2. A model of the external financing channel with managerial opportunism and internal governance

This section develops a model to examine how governance influences a firm's borrowing levels from traditional lenders and suppliers. The firm finances its operations through external borrowing, with trade credit (D_s) and traditional loans (D_d) as the two available sources. The model

analyzes two scenarios: one in which credit is freely available (non-rationing) and another in which credit from traditional lenders is rationed based on the firm's governance quality.

2.1 Non-rationing scenario

For simplicity, we assume that the manager first optimizes his personal utility and subsequently optimizes the firm's profit. This sequential approach simplifies the analysis by isolating the manager's decisions regarding personal benefits from his efforts to enhance firm performance. The model also assumes that the firm lacks internal funds and must fully rely on external credit to meet a fixed input requirement ($\bar{I}$) for production. The production process is represented as $\bar{y} = A\bar{I}$, where A is the productivity coefficient. Borrowing from traditional lenders incurs a rate r_d that depends on both the size of borrowing and the firm's governance, defined as: $r_d(D_d, G) = \beta D_d/\bar{I} + \eta(1 - G)$, where $\beta D_d/\bar{I}$ is inspired by Chod et al. (2019). The term, $\beta D_d/\bar{I}$, captures the linear relationship between borrowing costs and the firm's book leverage (D_d), normalized by the total required input ($\bar{I}$). The second term, $\eta(1 - G)$, accounts for the impact of corporate governance (G) on borrowing costs. We assume that weaker governance (lower G) leads to higher borrowing costs, reflecting the increased risks for lenders beyond those related to leverage. In contrast, trade credit is offered at a fixed, industry-specific rate $r_s = s$, unaffected by governance.

The manager is assumed to have the ability to divert funds from traditional loans for personal benefit, with the diversion rate denoted as θ . The manager's utility follows mean-variance utility function, reflecting a trade-off between the benefits of diversion and the probability and penalties for detection, which increase with the firm's governance. The utility function is given by:

$$U = f(\theta, G) = \mu(\theta) - \frac{\lambda}{2} \sigma^2(\theta, G) = \theta - \frac{\lambda p(G)}{2} \theta^2 \quad (1)$$

where $p(G)$ captures the penalty associated with diversion. The penalty function $p(G) > 0$ is strictly positive and increases with G , reflecting how stronger governance raises the likelihood and severity of penalties upon detection. The parameter $\lambda > 0$ reflects the manager's degree of risk aversion. Solving the manager's optimization problem yields the optimal diversion rate:

$$\theta^* = \min \left(\frac{1}{\lambda p(G)}, 1 \right) \quad (2)$$

This result implies that stronger governance reduces the manager's incentive to divert funds by increasing the penalties associated with such behavior.

Given the manager's optimal diversion choice, the manager then determines its borrowing levels to maximize the firm's profit:

$$\Pi = A\bar{I} - r_s D_s - r_d D_d, \quad (3)$$

where r_s and r_d refer to the costs of supplier financing and traditional debt financing, respectively, while D_s and D_d represent the amounts of credit the firm receives from the supplier and traditional lender, respectively. The profit is maximized subject to the following financing constraint:

$$s.t. \quad D_s + D_d(1 - \theta) = \bar{I} \quad (4)$$

Substituting the optimal θ into equation (3) and solving for the first-order conditions yield the following optimal borrowing levels:

$$D_d^* = \left(\frac{s - \eta(1 - G)}{2\beta} - \frac{s\theta^*}{2\beta} \right) \bar{I} = \left(\frac{s - \eta(1 - G)}{2\beta} - \frac{s}{2\beta\lambda p(G)} \right) \bar{I} \quad (5)$$

$$D_s^* = \bar{I} - (1 - \theta^*)D_d^* = \bar{I} - \left(1 - \frac{1}{\lambda p(G)} \right) \left(\frac{s - \eta(1 - G)}{2\beta} - \frac{s}{2\beta\lambda p(G)} \right) \bar{I} \quad (6)$$

The comparative statics of the model provide three key implications. First, better governance reduces borrowing costs from traditional lenders by 1) lowering r_d given the same level of leverage (i.e. same D_d), which allows the firm to rely more on traditional loans, and 2) reducing

the diversion rate (θ^*), which lowers inefficiencies in traditional borrowing and further increasing the firm's preference for D_d^* . Second, improved governance reshapes the borrowing structure by reducing the firm's reliance on trade credit (D_s^*), thereby decreasing dependence on suppliers. Lastly, in Figure 1, we show that stronger governance reduces the total borrowing costs charged by both the traditional lender and the supplier, based on the equilibrium solutions. The reliance on supplier financing (traditional debt financing) decreases (increases) as the quality of governance improves.

[Figure 1 about here]

2.2 Credit rationing scenario

When governance is poor, traditional lenders could impose borrowing limits, denoted as $D_d^{max}(G)$. Under this constraint, the firm's financing equation becomes:

$$D_s = \bar{I} - (1 - \theta^*)D_d^{max}(G) \geq \bar{I} - (1 - \theta^*)D_d^* \quad (7)$$

This scenario illustrates that poor governance compels the firm to rely more heavily on trade credit to meet its input requirements due to credit rationing by the traditional lender. As governance improves, lenders perceive a lower risk of diversion, which increases the borrowing cap ($D_d^{max}(G)$) and reduces the firm's dependence on supplier financing.

The profit function remains unchanged, but the borrowing constraint fundamentally alters the firm's financing structure. When D_d^* exceeds $D_d^{max}(G)$, the firm substitutes trade credit for the shortfall, increasing D_s . However, as governance strengthens, the cap on traditional loans rises, allowing the firm to shift away from higher-cost trade credit and reduce its overall financing costs.

The model demonstrates the role of governance in shaping borrowing decisions. Under non-rationing, strong governance reduces diversion and borrowing costs, leading to greater reliance on traditional borrowing. In contrast, under credit rationing, governance directly influences the

availability of traditional financing, with better governance alleviating reliance on trade credit and lowering financing costs.

3. Literature review and hypothesis development

Firms with weak internal governance typically exhibit lower board independence, inferior audit quality, and CEO duality (e.g., Core et al., 1999; Abbott et al., 2007; Kim and Lu, 2013; Fauver et al., 2017). This lack of robust oversight mechanisms creates an environment where unethical practices are more likely to occur. The existing literature documents that poor internal governance can lead to various forms of opportunistic or deceitful behavior, such as earnings manipulation (Lo et al., 2010; Cheng et al., 2016) and fraudulent financial reporting (Beasley, 1996; Beasley et al., 2000; Dunn, 2004; Lennox and Pittman, 2010). Therefore, firms with inadequate internal governance and weak oversight may have several incentives to report high levels of accounts payable on their balance sheets for signaling and opportunistic purposes (Gentry et al., 1990; Mateut and Chevapatrakul, 2018; Aktas et al., 2019; Arca et al., 2023).

Beasley (1996) suggests that the board's effectiveness depends on its ability to limit the decision-making discretion of top managers. Outside directors often have career concerns and reputation values (Jiang et al., 2016; Bryan and Mason, 2020). Hence, they are typically more driven to fulfill their oversight roles and resist collusion with managers in ways that could harm shareholder interests (Fama, 1980), which reduces the likelihood of financial statement fraud (Beasley, 1996). Thus, managers in firms with independent boards are disciplined by this oversight (Hazarika et al., 2012; Neville et al., 2019) and are consequently less likely to misuse supplier financing for personal use, a practice detrimental to the firm's profitability and supply chain stability.

The dual role of a CEO, who concurrently serves as board chairman, can also impact the

board's monitoring effectiveness. The dominance of top management on the board may increase the likelihood of fraudulent financial reporting (Dunn, 2004), facilitate collusion, decrease shareholder wealth (Fama, 1980), and lead to inefficient investments (Aktas et al., 2019). Therefore, separating the roles of CEO and chairman is a critical mechanism to restrain managers' tendencies toward self-serving activities.

Though board independence and the separation of CEO and chairman roles mitigate managerial opportunistic behavior through thorough oversight, audit quality also plays a critical role in detecting potential financial fraud (Lennox and Pittman, 2010) and reducing the risk of earnings management and financial misreporting (Zhang et al., 2007). Managers may abuse supplier financing for personal benefit and gain through inefficient investments. In addition, managers may temporarily manipulate net working capital for signaling purposes by using the cash retained from non-paying suppliers to enhance the company's liquidity position and engage in fraudulent activities, such as inflating payables with artificial invoices. There is global anecdotal evidence of accounting scandals where managers manipulated accounts payable for signaling purposes to investors and creditors. For instance, a British retailer, Tesco overstated profits by GBP 263 million in 2014 by recognizing promotional payments from suppliers earlier than it should have while also delaying the recording of payable costs. As a result, Tesco's accounts payable ratio to total assets surged from the three-year average of 12.1% from 2011–2013 to 22.4% in 2014.⁵ Satyam Computer Services, one of India's five top IT companies, used false invoices and bogus bank statements to create \$1 billion in fictitious cash and cash-related balances, making

⁵ See <https://ethicsunwrapped.utexas.edu/video/tesco-cooks-the-books> and <https://www.nytimes.com/2016/09/10/business/international/tesco-britain-fraud-accounting.html>.

the firm appear far more profitable to investors.⁶ Satyam's accounts payable ratio increased from a three-year average of 6.6% before the scandal to 14.9% after the fraud was revealed in 2008.

The well-known scandal case of Enron also involved accounts payable manipulation, among other fraudulent practices, where Enron executives strategically delayed payments to vendors and suppliers, misrepresented liabilities via special purpose entities, rapidly expanded into new markets and products to leverage its growth to obscure the actual state of its finances, and engaged in complex financial transactions and products to artificially inflate the company's financial position to mislead investors and analysts.⁷ For instance, Enron engaged in round-trip transactions, where it would sell goods or services to a third party and then repurchase them at a similar price, which artificially inflated accounts payable on the balance sheet, leading to a spike in that figure from a three-year average of 7.9% before the fraud to 14.9% in 2000.⁸

Firms with higher audit quality benefit from stringent audit processes, an independent approach to auditing, and more robust internal controls, making it easier to identify red flags, anomalies, and inconsistencies in the data on payables. This mitigates the risk of misstatements or misappropriation of funds. The presence of independent external auditors acts as a deterrent to fraudulent behavior and encourages management to uphold ethical standards in managing accounts payable. As such, these auditors would dissuade management from implementing signaling

⁶ See <https://www.sec.gov/news/press/2011/2011-81.htm>.

⁷ Enron engaged in various accounting manipulations by using off-balance-sheet special purpose entities to hide debt, deferring recognition of expenses, and boosting revenues. See <https://www.nytimes.com/2002/02/17/business/enron-s-many-strands-finances-enron-had-more-than-one-way-disguise-rapid-rise.html>.

⁸ These cases in point are not meant to be exhaustive. For example, DXP Enterprises Inc., a professional distribution management company, restated its consolidated balance sheets for December 31, 2020, and 2019. The restatements were due to delays in clearing aged payables caused by discrepancies in the company's three-way match process, additional considerations from a business combination, and other minor adjustments deemed immaterial by the company. Additionally, in 2012, Monster Beverage Corporation, one of the largest American beverage firms, restated its 2010 consolidated balance sheet, adjusting accounts receivable upward by 64%. These instances indirectly suggest that managers might have the potential to use accounts payable and accounts receivable to signal their operation's efficiency.

strategies with trade credit in financial reporting.

In addition, when they are poorly monitored, managers may strategically inflate accounts payable to signal their strong bargaining power in the market (Mateut and Chevapatrakul, 2018) and convey suppliers' positive expectations about their business operations and creditworthiness to potential creditors to attract funding (Biais and Gollier, 1997). Studies like those by Del Gaudio et al. (2022) and Arca et al. (2023) also identify the signaling effect of accounts payable on bank credit. For instance, Arca et al. (2023) find that more outstanding payables are associated with a higher likelihood of obtaining bank credit and incurring lower costs. Investors often view leveraging high levels of accounts payable as a value-enhancing strategy for firms, especially during financial crises (Nam and Uchida, 2019). Furthermore, managers may deliberately increase accounts payable and retain cash from not paying suppliers to temporarily enhance the firm's liquidity position (Gentry et al., 1990).⁹ This allows the firm to report higher cash balances or to invest this cash in short-term opportunities, which may be subject to managerial opportunistic behaviors, such as the misappropriation and misallocation of capital (Jensen and Meckling, 1976; Jensen, 1986; Beasley, 1996; Aktas et al., 2019). Such practices could create the false impression of efficient working capital management and financial soundness by showing that the firm effectively uses its short-term assets and liabilities to finance operations and possibly generate returns.¹⁰

Based on the above discussions and the implications of the model in Section 2, we propose the following hypothesis:

⁹ Gao et al. (2013) also find that when a firm's governance is poor, managers, who prefer more freedom from external monitoring, hold more internal slack. Consequently, managers are incentivized to inflate accounts payable to retain more cash.

¹⁰ Recent studies demonstrate that firms which are adept at managing their net working capital, as gauged by the cash conversion cycle (shorter cycles are preferred over longer cycles), tend to enjoy greater profitability, enhanced cash flows, and superior stock returns compared to those with subpar management of net working capital (e.g., Zeidan and Shapir, 2017; Wang, 2019). Increasing accounts payables decreases the cash conversion cycle, *ceteris paribus*.

H1: The level of firms' accounts payable is negatively related to the quality of their internal governance, all else being equal.

While weak governance structures can incentivize managerial opportunism and inflate accounts payable, they limit access to traditional financing options like bank loans or equity issuance (Petersen and Rajan, 1994, 1997; Molina and Preve, 2012). Consistent with our model, this forces firms to rely more heavily on trade credit, a more readily available funding source compared to conventional channels. Despite potentially higher costs associated with supplier financing, capital-constrained firms view trade credit as a crucial tool to manage temporary funding shortages and mitigate limitations on raising equity (Herbst, 1974; Petersen and Rajan, 1994; Biais and Gollier, 1997). Consequently, firms with poor internal governance may become overly dependent on trade credit due to market inefficiencies and restricted access to other forms of credit. This lack of external financing generated by poor management can lead to inefficient investment (Kaplan and Zingales, 1997; Richardson, 2006; Almeida and Campello, 2007; Harford et al., 2008; Duchin et al., 2010) and relatively lower firm performance (Whited and Wu, 2006; Lamont et al., 2015; Bhagat and Bolton, 2019).

Consistent with the model implications from Section 2, if increased reliance on supplier financing is a crucial factor driving the relationship between corporate governance and trade credit usage (i.e., an external financing mechanism), then the following hypotheses are likely to hold:

H2a: The negative effect of corporate governance on payables is more pronounced for firms in countries with better country-level financial/stock market development.

H2b: The negative effect of corporate governance on payables is more pronounced for financially fragile firms.

H2c: The positive effect of corporate governance on firm investment is more pronounced for

financially fragile firms.

H2d: *The positive effect of corporate governance on firm performance is more pronounced for financially fragile firms and firms with high agency costs.*

The relative influence of a company's internal governance practices (e.g., board structure) and the external governance environment (e.g., legal systems) is a topic of ongoing debate with significant policy implications. Some research suggests a substitution effect, where strong country-level governance mechanisms (e.g., legal frameworks) can lessen the impact of board reforms (Chen et al., 2020, 2022; Driss, 2022; Qiu and To, 2022). In other words, firms with robust external governance, through regulatory oversight or active markets, may require less strong internal governance mechanisms, such as a highly independent board or rigorous internal controls. Conversely, other studies (e.g., Bae et al., 2021; Ben-Nasr et al., 2021; Dak-Adzaklo and Wong, 2024) propose a complementary effect, arguing that board reforms can enhance the effectiveness of supervision within countries that already have strong formal and informal institutions. Both of these positions suggest that internal governance and external governance are related. Given our research design, we can test the validity of the board reform shocks and their effect on trade credit. We remain agnostic as to the substitutability or complementarity of external governance and propose the final hypothesis:

H3: *External governance either increases or decreases the relation between internal governance and accounts payable.*

4. Sample, variable construction, and research design

4.1 Sample selection

We collect data on major board reforms from 41 countries between 1998 and 2007, as compiled by Fauver et al. (2017), as well as firm-level annual accounting information from

Compustat North America and Global databases, and macroeconomic variables from the World Development Indicators (WDI) database.¹¹ We exclude financial firms (SIC codes 6000–6999), utilities (SIC codes 4900–4999), and governmental and quasi-governmental entities (SIC codes 9000–9999), as well as firms with negative total assets. Following Fauver et al. (2017), we restrict our sample to a $[-5, +5]$ -year window around year 0, which is the year immediately before the reforms. Our baseline sample covers 157,704 firm-year observations for 28,472 unique firms from 38 countries with non-missing values for all control variables.

4.2 Variable construction

4.2.1 Measuring trade credit

Following prior studies (Petersen and Rajan, 1997; Cuñat, 2007; Ge and Qiu, 2007; Love et al., 2007; Giannetti et al., 2011), trade credit is defined as the Payables-to-Assets ratio, which is calculated as the ratio of accounts payable to total assets. This reflects the extent of trade credit a firm secures from its suppliers. In robustness checks, we adopt two alternative trade credit measures: 1) the Net Payables-to-Assets ratio, which adjusts for accounts receivable to provide a net view of trade credit utilization, and 2) the Net Payables-to-COGS ratio, offering insight into how net trade credit facilitates purchases (Zhang, 2019). Additionally, we measure the scale of trade credit a firm extends to its customers using the Receivables-to-Sales ratio to illustrate a comprehensive approach to understanding trade credit dynamics along the supply chain.

4.2.2 Measuring board reform

We follow the methodology of Fauver et al. (2017) and construct our primary board reform measure, *POST*, which is a dummy variable equal to one in the years following the enactment of the board reform in a country, and zero otherwise. Additionally, we construct alternative dummy

¹¹ A number of studies also focus on the effect of major reforms rather than first reforms (e.g., Bae et al., 2021; Chen et al., 2022; Driss, 2022; Liao et al., 2022a; Li et al., 2023).

measures of board reforms based on the three components identified by Fauver et al. (2017): board independence, audit committee and auditor independence, and chairman-CEO separation.

4.3 Regression specification

To test Hypothesis H1, we estimate the following baseline DID regression model:

$$TC_{i,j,t} = \delta \times POST_{j,t} + \beta' X_{i,j,t-1} + \sum_i \gamma_i Firm\ dummy_i + \sum_t \theta_t Year\ dummy_t + \varepsilon_{i,t}, \quad (8)$$

where $TC_{i,j,t}$ is a trade credit measure for firm i in country j in year t , and $POST_{j,t}$ is a dummy variable indicating the post-reform period. In the baseline regression, the dependent variable is the Payables-to-Assets ratio. The primary interest lies in the effect of major board reforms on firms' trade credit, denoted by δ . We include a set of control variables, $X_{i,j,t-1}$, to account for firm-specific and country-specific factors from the preceding year. Following previous literature (Calomiris et al., 1995; Petersen and Rajan, 1997; Love et al., 2007; Shang, 2020), we include typical firm-specific control variables: the natural logarithm of total assets ($\ln(SIZE)$), the firm's leverage level (Leverage) and asset tangibility (Tangibility) to capture the firm's access to external financing; return on asset (ROA) to capture the firm's internal financing condition; sales growth (Sales growth) and inventory-to-sales ratio (Inventory) to capture investment opportunities and inventory management inefficiency; research and development investment (R&D) and the level of capital expenditures to property, plant, and equipment (Capital expenditures) to account for the firm's investment profile. Additionally, since the use of trade credit is affected by a firm's market position, we also incorporate market share (Market Share) as a control variable (Gofman and Wu, 2022). Furthermore, we control for country-level variables that reflect each nation's economic and financial development. Specifically, we use the natural logarithm of GDP ($\ln(GDP)$) and GDP growth to capture the economic development of countries. To capture the evolution of lending markets and stock market development, we include measures of domestic credit use (Financial

Development) and the ratio of stock market capitalization to GDP (Stock Market Size). We include firm and year fixed effects to identify the within-firm and within-year changes in trade credit between treatment and control firms following reforms. Standard errors are clustered at the firm level to correct for heteroscedasticity and within-firm residual correlation.¹² All variables are defined in Appendix A.

4.4 Descriptive statistics

Panel A of Table 1 reports the number of firm-year observations and unique firms included for each country in our baseline sample, along with the years of major board reforms implemented by country. The distribution of firms per country varies widely. Panel B details the major board-reform components and the reform approaches by country. We note that 74% of the sampled countries have undertaken reforms related to board independence, 82% have implemented audit committee independence, and 26% have separated the CEO and chairman roles. Moreover, 53% of the countries in our sample have adopted comply-or-explain reforms, and 47% have implemented rule-based reforms. Panel C presents summary statistics for the variables used in our main analysis. All continuous variables are winsorized at the 1% and 99% levels. Our main dependent variable, trade credit (Payables/Asset), has a mean of 0.119 and a median of 0.085. POST has a mean of 0.565, indicating that 56.5% of the firm-year observations are from the period after the board reform implementation. On average, firms in our sample exhibit a leverage ratio of 25.3%, sales growth of 25.3%, a market share of 5.4%, R&D expenses amounting to 10.6%, capital expenditures of 5.9%, tangibility of 30.7%, and an ROA of 2.9%.

¹² Following prior studies (Chen et al., 2020; Hu et al., 2020; Dak-Adzaklo and Wong, 2024), we cluster standard errors at the firm level also because clustering at the country level could lead to biased standard errors if some countries have fewer observations (Petersen, 2009; Abadie et al., 2023). Nonetheless, we find qualitatively similar results when clustering standard errors at higher levels. Our results are also robust to clustering standard errors by firm and year to account for potential cross-sectional and serial correlations.

[Table 1 about here]

5. Empirical results

In this section, we first examine the impact of board reforms on a firm's supplier financing. We then conduct a series of robustness tests to confirm our baseline results. Next, we explore the influence of internal board and external governance on trade credit use and investigate the potential economic channels through which board reforms affect a firm's accounts payable.

5.1 Baseline regression results

We begin by estimating the DID regression model in a two-way fixed effects (TWFE) form without covariates, serving as a benchmark model. This approach alleviates the concern about the potential violations of treatment effect homogeneity and the parallel trends assumption for time-varying covariates between treatment and control groups, as noted by Sant'Anna and Zhao (2020) and Baker et al. (2022). Specifically, in Column (1), we assess the impact of board reforms on accounts payable, controlling for firm and year fixed effects. Column (2) refines the model to include firm-level control variables. Column (3) presents the baseline estimation results of equation (8), which incorporates both firm-level and country-level control variables, thereby controlling for macroeconomic heterogeneity across countries.

We find that the coefficient of our variable of interest, *POST*, is significantly negative at the 1% level in all three columns, which aligns with our hypothesis (H1). Economically, the coefficients on *POST* in Table 2 suggest that major board reforms are associated with decreases in accounts payable, ranging on average from 3.4% (calculated as $-0.004/0.119$) to 5.9% (calculated as $-0.007/0.119$), relative to the mean of accounts payable. This finding indicates a significant reduction in firms' reliance on accounts payable after the reform, which is consistent with both the implications of our proposed model and Hypothesis 1.

[Table 2 about here]

5.2 Robustness tests

5.2.1 Placebo test

We implement a placebo test to ensure that our baseline results are not driven by omitted time-varying covariates and confounding events, similar to Bae et al. (2021). This test randomly assigns years of board governance reform to our sample countries and then estimates our baseline regression model. The process is repeated 1,000 times. The results depicted in Figure 2 reveal that: 1) the distribution of the coefficient estimates for POST is centered around zero, suggesting that the randomly generated value for POST bears no significant relation to accounts payable; and 2) our baseline estimate (indicated by the red line) falls outside this distribution. These findings suggest that our baseline results are not spuriously induced.

[Figure 2 about here]

5.2.2 Callaway and Sant’Anna (2021) estimator

The recent econometric literature raises concerns regarding standard TWFE staggered DID estimators, where treatment units are compared to inappropriate controls (e.g., Callaway and Sant’Anna, 2021; Goodman-Bacon, 2021; Athey and Imbens, 2022; Borusyak et al., 2024). We first address this problem by using the estimator introduced by Callaway and Sant’Anna (2021), which estimates cohort-time-specific treatment effects using clean controls.¹³ The results for the point estimates and their 95% confidence intervals are presented in Figure 3.

Figure 3(a) shows the Callaway and Sant’Anna (2021) estimates by relative time within the event window of $[-5, +5]$, where year 0 is the first year the major board reform becomes effective. We observe sustained negative estimated effects following the board reform. The overall Average

¹³ We also adopt a stacked regression approach, and the results are reported in Column (2) of Panel A in Table 3.

Treatment Effect on the Treated (ATT) estimate for the pre-treatment period (Pre) is not statistically different from zero, while the overall ATT estimate for the post-treatment period (Post) is -0.009 and significant at the 1% level.¹⁴ Most confidence interval bands for each ATT in the years before the reform year, as well as for the overall ATT estimate for the pre-treatment period, overlap zero, indicating parallel trends. These findings lend support to our baseline findings. Figure 3(b) depicts the Callaway and Sant'Anna (2021) ATT estimates by cohort years (i.e., aggregating ATT by cohort year). It shows that the overall ATT is -0.006, which is significant at the 1% level, and board reforms across different cohort years significantly negatively impact firms' reliance on accounts payable. In Figure 3(c), we also find consistent evidence for Callaway and Sant'Anna (2021) ATT estimates by calendar years, demonstrating how the average treatment effects vary year after year compared to the control group. The overall ATT is -0.009, which is significant at the 1% level.

[Figure 3 about here]

5.2.3 Dynamic DID model

We use a dynamic DID model to validate the pre-reform parallel trends assumption and to address the concern that concurrent and unobservable events may influence our baseline results. Similar to Fauver et al. (2017), we define a set of dummy variables to indicate whether a given year is the year of adoption (Year 1), the second year (Year 2), or the third and subsequent years (Years 3+) after the reforms, as well as the three years before the reforms (Years -2 to 0). The first three pre-reform years (Years -5 to -3) of the countries are omitted as the reference period. Results are shown in Column (1) of Panel A in Table 3.

We find no significant difference in accounts payable between treatment and control firms

¹⁴ To estimate the ATT, we use not-yet-treated firms as control firms in our full sample and a regression approach without covariates (Baker et al., 2022).

before the board reforms, indicating that the parallel-trends assumption is satisfied. The negative and significant coefficients in the post-reform years (Year 1, Year 2, and Years 3+) indicate that firms reduce their reliance on accounts payable following board reforms, which significantly lower agency problems. The magnitude of the estimated coefficients in the post-reform years also suggests that board reforms have a delayed effect, with a more substantial impact becoming apparent from the first year and continuing into subsequent years.

[Table 3 about here]

5.2.4 Stacked regression

Staggered DID models could yield biased estimates if early-treated firms are used as controls for later-treated firms, as mentioned earlier in Section 4.2.2. To avoid this heterogeneous treatment problem, we employ an alternative event-based stacked regression approach that includes firms yet to be treated during the event window as the control group. This approach is in line with Fauver et al. (2017), Cengiz et al. (2019), and Barrios (2022).¹⁵ Like Liao et al. (2022b) and Fauver et al. (2024), we stack all the specific datasets for each treatment cohort and perform regression analysis, incorporating fixed effects controls for the firm-treatment cohort interaction and the year-treatment cohort interaction. The coefficient presented in Column (2) of Panel A produces inferences that align with those from our baseline tests.

5.2.5 Alternative fixed effects

Column (3) of Panel A shows robust results when we further control for industry-year fixed effects to absorb the impact of unobserved industry-specific time-varying characteristics.

5.2.6 Country and year clustering

¹⁵ Never-treated countries are not included in the control group because board reforms are pervasive, and it is difficult to find countries that have never had any type of board reforms to be comparable to those that have (Fauver et al., 2017, 2024).

Column (4) shows consistent results when we adopt a more conservative specification by clustering standard errors by country and year. This approach accounts for potential correlations within these grouping units, which may arise from unobserved heterogeneity or time-specific shocks shared across multiple years within countries.

5.2.7 Alternative samples

In this subsection, we check whether our baseline results are robust to using alternative samples and we report the findings in Table 3, Panel B. In Column (1), we apply the entropy balancing method introduced by Hainmueller (2012) to ensure that the treatment and control groups are comparable based on a set of covariates.¹⁶ Next, we re-estimate our baseline model using a balanced sample, requiring firms to have data available for pre- and post-reform periods, as shown in Column (2). A full sample without the 11-year event window limitation is used in Column (3). In Column (4), we assess the robustness of our baseline results by excluding U.S. firms, which constitute approximately one-third of our sample. Additionally, we construct the *POST* variable using the initial board reforms and report the results in Column (5). Finally, in Column (6), our estimation is confined to WorldScope firms that meet our data criteria.¹⁷ Across all six models, the estimates for the *POST* coefficient remain negative and statistically significant at the 1% level.

5.2.8 Alternative measures of trade credit

Following the trade credit literature (e.g., Restrepo et al., 2019; Gofman and Wu, 2022), we adopt two alternative measures of accounts payable using net accounts payable: Net

¹⁶ The benefits of the entropy balancing method include enhanced causal inference through isolating the treatment or intervention effect from confounding factors, and retention of the full sample by reweighting observations to create an entropy-balanced sample.

¹⁷ Similar to Compustat Global and North America, WorldScope also offers worldwide coverage of a variety of financial metrics, but it provides more comprehensive data on companies in Europe, Asia, and emerging markets.

Payables/Assets and Net Payables/Cost of Goods Sold. These two measures reflect the net use of accounts payable by excluding the demand for credit from downstream firms because firms may raise funds to extend credits to their financially constrained customers (Adelino et al., 2022). Results in Columns (1) and (2) of Panel C indicate that firms reduce their reliance on net accounts payable relative to accounts receivable following the board reform, which supports our baseline findings.

We further calculate unexpected accounts payable (UAP) to capture abnormal accounts payable due to managerial signaling or manipulation. Specifically, UAP is the difference between the actual accounts payable and its expected value, scaled by lagged total assets (Mulford and Comiskey, 2002, p. 187; Marquardt and Wiedman, 2004; Arcas and Martí 2016). The expected value is calculated by multiplying the lagged accounts payable by the growth in sales. The results in Column (3) indicate that firms reduce their discretionary accounts payable post-reform, lending support to our hypothesis that firms with weak governance tend to have an excessively high level of accounts payable.

Column (4) also shows that firms are more inclined to extend trade credit to their customers following the reform. This result suggests that board reforms decrease a firm's dependence on supplier financing and also augment their capacity to offer more trade financing to their customers, thereby bolstering supply chain stability. The finding also implies that board reforms, which improve a firm's internal governance, could help enhance customer relations and expand its customer base. Similarly, we calculate unexpected accounts receivable (UAR) and report the results in Column (5). This finding indicates that firms increase their discretionary accounts receivable post-reform, which is consistent with the results regarding the level of accounts receivable. Taken together, the finding that receivables increase after board reform (i.e., better

corporate governance) is consistent with studies showing that firms that extend more trade credit experience higher operating profitability and greater stock returns (e.g., Goto et al., 2015; Box et al., 2018)

5.2.9 Board reform components

We examine the distinct roles of different characteristics of board reforms in accounts payable management. Following Fauver et al. (2017), we assess the individual impacts of critical components of board reform: 1) board independence, 2) audit committee and auditor independence, and 3) separation of the roles of chairman and CEO. Both the reform for board independence and the separation of the chairman and CEO roles enhance the oversight capabilities of the board. Improved monitoring reduces managers' tendencies toward self-serving activities, thereby mitigating agency conflicts between the management and stakeholders. The reform associated with audit committees and auditor independence enhances the quality of corporate financial reporting (Chen et al., 2022). It also facilitates better communication between the committee and both internal and external auditors (Beasley et al., 2009), which helps identify and prevent opportunistic managerial behaviors. Together, these three aspects of reforms contribute to strengthened internal governance.

We re-estimate our baseline DID model for each specific reform by replacing the POST variable with POST_INDEP, POST_AUDIT and POST_CEOCHAIR, respectively. Each POST variable (POST_INDEP, POST_AUDIT, and POST_CEOCHAIR) is a dummy variable that equals one for the five years starting from when a major board reform—covering board independence, audit committee, and auditor independence, and separation of the chairman and CEO positions, respectively—becomes effective in the country (Fauver et al., 2017). Panel D of Table 3 presents the results. The estimated coefficients are negative and significant for all three

board reforms. This suggests that each reform aimed at strengthening internal governance leads to a decrease in the use of accounts payable. Additionally, the result that audit reforms reduce payables is consistent with the notion that independent external auditors mitigate the signaling incentive of managers.

5.3 The role of internal governance

When boards are less independent, it becomes more challenging for them to monitor how CEOs finance operations and manage cash (Chen et al., 2015; Guo and Masulis, 2015), making it easier for CEOs to engage in self-serving activities. Therefore, firms with poor board independence prior to reform are more likely to overuse accounts payable and are mostly affected by these reforms.

To capture the level of board independence, we introduce two variables: 1) LOW_INDEP, a dummy variable that equals one if the proportion of independent directors on the board of a firm is lower than the country median in the year prior to the reform, and zero otherwise; and 2) LOW_INDEP50, a dummy variable that equals one if the proportion of independent directors on the board of a firm is less than 50% in the year prior to the reform, and zero otherwise. We first multiply these two variables by POST, respectively, to examine the effects of board reform. If board reform effectively enhances internal governance, thereby reducing the overuse of accounts payable in firms, we anticipate significantly negative coefficients for these interactions. Results in Columns (1) and (2) of Panel A of Table 4 are consistent with this prediction.

Next, we test whether major board reforms that involve board independence (POST_INDEP) have a more substantial negative impact on accounts payable for firms with weaker board independence pre-reform. In Columns (3) and (4) of Panel A, we find negative and significant coefficients on the interaction terms, supporting the view that managers in firms with low board

independence tend to be overly dependent on supplier financing, and board reforms can mitigate this issue by enhancing internal governance.

The *F*-statistic tests suggest that the sum of the coefficients for each column of Panel A is significantly less than zero at the 10% level, indicating that firms with low board independence experience a greater reduction in payables compared to other firms in the post-reform period. Firms with weak internal governance often suffer from agency costs. We test whether the negative effect of board reforms on accounts payable is more pronounced for firms with higher agency costs (i.e., weaker internal governance) pre-reform. Agency costs are proxied by the expense ratio (Ang et al., 2000; Chen et al., 2022), calculated as operating expenses (the sum of cost of goods sold (COGS) and selling, general, and administrative expenses (XSGA)), divided by total assets (AT).

We construct a dummy variable (HIGH_AC) that equals one if a firm's expense ratio is higher than the median value of the country in the year prior to the enactment of major board reforms, and zero otherwise. We interact HIGH_AC respectively with POST, and each component of board reform (POST_INDEP, POST_AUDIT, and POST_CEOCHAIR). The results are reported in Panel B of Table 4. Consistent with our predictions, the coefficients for all four interaction terms are significantly negative, and the sum of the coefficients for each column is significantly less than zero at the 1% level. This suggests that firms with high agency costs experience a greater reduction in payables compared to other firms in the post-reform period. Overall, the findings support our argument that improvements in internal governance through board reforms reduce agency problems and help mitigate firms' overuse of accounts payable due to managers' opportunistic and signaling incentives.

[Table 4 about here]

5.4 The role of the external financial environment

The level of development in the financial environment can significantly influence a firm's ability to secure external financing. For example, firms operating within a robust financial environment are more likely to obtain the funding through bank loans and equity issuance (Atanasova and Wilson, 2003; Drakos and Giannakopoulos, 2011). Board reforms that strengthen internal governance and reduce agency costs can thus enable firms to achieve greater access to external financing, thereby lessening their overreliance on accounts payable. However, firms in underdeveloped financial environments may still encounter difficulties in acquiring more affordable alternative financing from creditors due to limitations within the external financial system, despite internal governance improvements from board reforms.¹⁸ As a result, these firms often have to resort to supplier financing, which can be more expensive and potentially lead to the mistreatment of suppliers. Therefore, board reforms are anticipated to have a more significant negative impact on a firm's use of accounts payable when operating in financially developed environments.

The extent of the external financing environment is gauged by the level of a country's financial development (FD) and stock market development (STOCK), following the literature (e.g., Fisman and Love, 2003; Lei et al., 2018). Two dummy variables, HIGH_FD and HIGH_STOCK, were constructed. HIGH_FD is assigned a value of one if the country's ratio of domestic credit to the private sector, as a percentage of GDP, exceeds the median for the countries in the sample in the year before significant board reforms, and zero otherwise. HIGH_STOCK is assigned a value of one if the country's stock trading volume, as a percentage of GDP, is higher than the median for the countries in the sample in the year before significant board reforms, and zero otherwise.

We regress accounts payable on the interaction between POST and each measure of the

¹⁸ Lenders and investors in underdeveloped markets may charge a higher premium or even develop a reluctance to lend at all (Kjenstad et al., 2015).

external financing environment. The results, presented in Table 5, support hypothesis H2a. The negative and statistically significant coefficients on the interaction terms in Columns (1) and (2), along with the statistically significant *F*-statistic tests for the sum of coefficients, suggest that a more favorable external financing environment amplifies the negative effect of board reforms on firms' reliance on supplier financing.

[Table 5 about here]

5.5 The role of financial fragility

In this subsection, we examine the impact of board reforms on a firm's reliance on accounts payable, conditional on the firm's financial fragility. Bernanke and Gertler (1990) suggest that financial fragility arises when firms rely heavily on external financing for their investment projects. This reliance increases the agency's costs of financing due to problems such as information asymmetry and moral hazard, leading to investment inefficiencies and reduced performance. Firms characterized as financially fragile may have a higher need for external financing, face more significant financial constraints, endure greater uncertainty regarding demand, and operate in highly competitive markets. Consequently, financially fragile firms may demand more trade credit for financing, in part because of credit rationing (Atanasova, 2007; Murfin and Njoroge, 2015).¹⁹ If board reforms improve internal governance and reduce agency problems, thereby mitigating market frictions caused by agency costs, we would expect that the negative impact of board reforms on the reliance on accounts payable would be more pronounced in financially fragile firms prior to the reform.²⁰

¹⁹ Firms operating in competitive industries may also strategically increase their payables to avoid indirectly subsidizing the growth of their product rivals. This could happen through generous payable policies to upstream firms, as their rivals might demand trade credits from common suppliers (Freeman et al., 2024).

²⁰ The role of board reforms in reducing agency conflicts is well-recognized by the extant literature (Hu et al., 2020; Bae et al., 2021; Driss, 2023). First, board reforms enhance the oversight function of boards, leading to a decline in managerial information concealment, which in turn decreases the information asymmetry between insiders and outsiders (Qiu and To, 2022). Reduced information asymmetry enables financial intermediaries to assess a firm's

To test this prediction, we split our sample based on four proxies for financial fragility: 1) external financing needs, defined as the firm-level financing gap (EFN), which is the difference between net cash flow from investing activities and net cash flow from operating activities, deflated by the book value of total assets (AT); 2) financial constraints, measured by the WW index (Whited and Wu, 2006); 3) demand uncertainty (DEMUNC), calculated as the standard deviation of annual changes in log-sales over the previous five years, similar to Irvine et al. (2016); and 4) market competition, measured by the sales-based Herfindahl-Hirschman Index (HHI). As shown in Table 6, Columns (1) and (3) of Panel A, and Columns (1) and (3) of Panel B, financially fragile firms rely less on supplier financing after the reforms. Consistent with hypothesis H2b, this suggests that financially fragile firms could better tap into external financial markets for alternative financing options. In contrast, we do not find a significant effect of board reforms on payables for less financially fragile firms. The *p*-values for differences between our split subsamples are notably significant, ranging from the 1% to the 5% level.

[Table 6 about here]

5.6 Effect of board reforms on investment

We further examine whether board reforms that mitigate agency problems and credit rationing problems promote firm investment and whether the effect is more pronounced for financially fragile firms.

We adopt a TWFE DID framework and regress firm investment on POST. Firm investment is proxied by capital investment (Capex), non-capital investment (Non-Capex), and total investment (Total Investment) (e.g., Biddle et al., 2009; Garc á Lara et al., 2016; Chen et al., 2017;

operational conditions and future prospects more accurately. Consequently, it becomes less likely for firms to forego positive NPV projects due to challenges in sourcing external capital from these intermediaries (Stiglitz and Weiss, 1981). With decreased pressure from credit rationing, firms have the flexibility to choose comparatively affordable alternative external financing, thus reducing their dependence on supplier financing (Biais and Gollier, 1997).

Baik et al., 2023). Capex is capital expenditure (CAPX) minus cash receipts from the sale of property, plant, and equipment (SPPIV), scaled by lagged total assets (AT). Non-Capex is the sum of R&D expenses (XRD), acquisitions (AQC), and advertising expenses (XAD), scaled by lagged total assets (AT). Total Investment is the sum of Capex and Non-Capex.

The positive and significant coefficients on POST in Panel A of Table 7 indicate that firms increase their capital, non-capital, and total investment post-reform. Panel B divides the sample according to the four proxies for financial fragility: external financing needs, financial constraints, demand uncertainty, and market competition. We observe that financially fragile firms increase their investment more after the reforms compared to their less financially fragile counterparts. These findings support hypothesis H2d and suggest board reforms reduce firms' reliance on supplier financing by improving their corporate governance and excess to external credit.

[Table 7 about here]

5.7 Effect of board reforms on firm performance

We next explore the impact of board reforms on operating performance and assess whether this effect varies with firms' agency costs and financial fragility. Based on the model's implications and the total borrowing cost illustrated in Figure 1, the total borrowing cost is expected to decline as firms rely less on high-marginal-cost supplier financing to meet their production needs. Consequently, we predict an improvement in operating performance following the reform. Column (1) of Panel A in Table 8 shows that post-board reform, firms exhibit a notable improvement in performance as measured by Return on Assets (ROA), in line with Driss (2022).²¹ These findings highlight a performance channel through which board reforms boost operational efficiency and firm performance, thereby reducing firms' reliance on supplier financing. This

²¹ In unreported results, we find that firms tend to have lower inventory holdings relative to their total assets post-reform. This also indicates that firms enjoy more efficient inventory management and a shorter cash conversion cycle.

relationship is evidenced by the negative and significant coefficient on ROA in our baseline results, as presented in Table 2.

If board reforms improve board independence and audit quality, which in turn reduce agency problems such as accounts payable manipulation and earnings management, one would anticipate a more pronounced increase in operating performance among firms with high agency costs before the reform. The results in Column (2) of Panel A confirm this prediction.

Consistent with our previous findings that financially fragile firms invest more and reduce accounts payable following board reforms, the positive and significant interaction terms between the POST variable and the proxies for financial fragility suggest that board reform significantly enhances performance in firms that are characterized by higher financial fragility before the reform.

[Table 8 about here]

5.8 The role of external governance

We now explore the effect of external governance mechanisms on the negative association between the quality of a firm's internal governance and its accounts payable. External governance generally refers to the regulatory, market, and societal forces that can potentially influence corporate behavior, and its relationship with internal governance could be complementary or substitutionary (e.g., Weir et al., 2002; Qiu and To, 2022).

To investigate the role of external governance mechanisms, we first measure country-level external governance using formal institutions, such as the World Bank's annual average of six aggregate worldwide governance indicators (WGI), and the World Bank's annual contract enforcement index (CONT_ENF), as well as informal institutions proxied by the World Values Survey's (WVS) social trust score (TRUST). The TRUST score is calculated based on the percentage of respondents in each country who select the option "most people can be trusted." We

then construct three dummies (HIGH_WGI, HIGH_CONT_ENF, and HIGH_TRUST) and extend our baseline model by interacting each with POST. Specifically, a dummy variable equals one if its corresponding proxy for institution quality is above the median of the sampled countries in the year prior to the enactment of major board reforms, and zero otherwise.²²

We find evidence supporting hypothesis H3. In Table 9, the positive and significant estimates of the interaction terms with POST, along with the significant negative sum of coefficients for each column, indicate a complementary relationship between external and internal governance mechanisms. This finding suggests that board reforms lead to more effective board monitoring within countries that possess strong formal and informal institutions and underscores the enforcement role of external governance. These results are consistent with the complementary role of external governance (e.g., Bae et al., 2021; Ben-Nasr et al., 2021; Dak-Adzaklo and Wong, 2024).

[Table 9 about here]

6. Conclusion

Prior studies have documented that firms extensively use trade credit despite its high implicit cost. Some papers attribute this practice to credit rationing, yet less attention has been paid to whether the quality of corporate governance drives such excessive use of trade credit.

Our study addresses this question by providing evidence that firms may maintain high levels of accounts payable due to inadequate internal governance. We develop a model that implies governance can reduce the use of trade credit through an external financing mechanism. Utilizing board reform in various countries as an exogenous shock to firms' internal governance, we employ a staggered DID design to investigate changes in firms' use of accounts payable following

²² A detailed description of HIGH_WGI, HIGH_CONT_ENF, and HIGH_TRUST is outlined in Appendix A.

governance improvements. We found a significant reduction in the use of accounts payable after the reform. Notably, this effect of reform is more pronounced among firms with poor internal governance, significant agency problems, and greater financing constraints prior to the reform. Our findings remain robust through a series of robustness checks. Further study suggests that following board reform, firms experience an increase in investment and profit levels, indicating that board reform mitigates existing agency issues and enhances the firm's financial health and operational performance.

Our study contributes to the literature on trade credit and board reform. We demonstrate that firms with inadequate internal governance indeed engage in the excessive use of accounts payable, and these issues can be alleviated by the implementation of policies designed to improve internal governance. Additionally, we contribute to the debate concerning substitutionary or complementary nature between internal and external governance by providing evidence supporting the complementary view. Specifically, board reform laws have a more substantial impact on the use of trade credit in countries with better external governance.

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Figure 1. Model simulation

The simulation uses the following parameters: a trade credit interest rate (s) of 0.1, governance sensitivity to traditional borrowing cost (η) of 0.05, borrowing sensitivity to loan size (β) of 0.08, a fixed production input ($\bar{I}$) of 1, and a risk aversion coefficient (λ) of 3, which governs the degree of manager's risk diversion to potential penalty. The penalty function $p(G)$ is specified as $2 \times (0.5 + G)$, reflecting the increasing cost of diversion with stronger governance G . The results show that the optimal diversion rate (θ^*) decreases with higher G . As governance improves, borrowing from traditional lenders (D_d^*) rises due to lower borrowing costs, while borrowing from suppliers (D_s^*) declines, reflecting reduced reliance on trade credit. Total borrowing costs decrease with better governance, driven by the firm's shift toward more cost-efficient traditional loans. These findings underscore the critical role of governance in shaping borrowing decisions, optimizing financing structures, and minimizing overall costs.

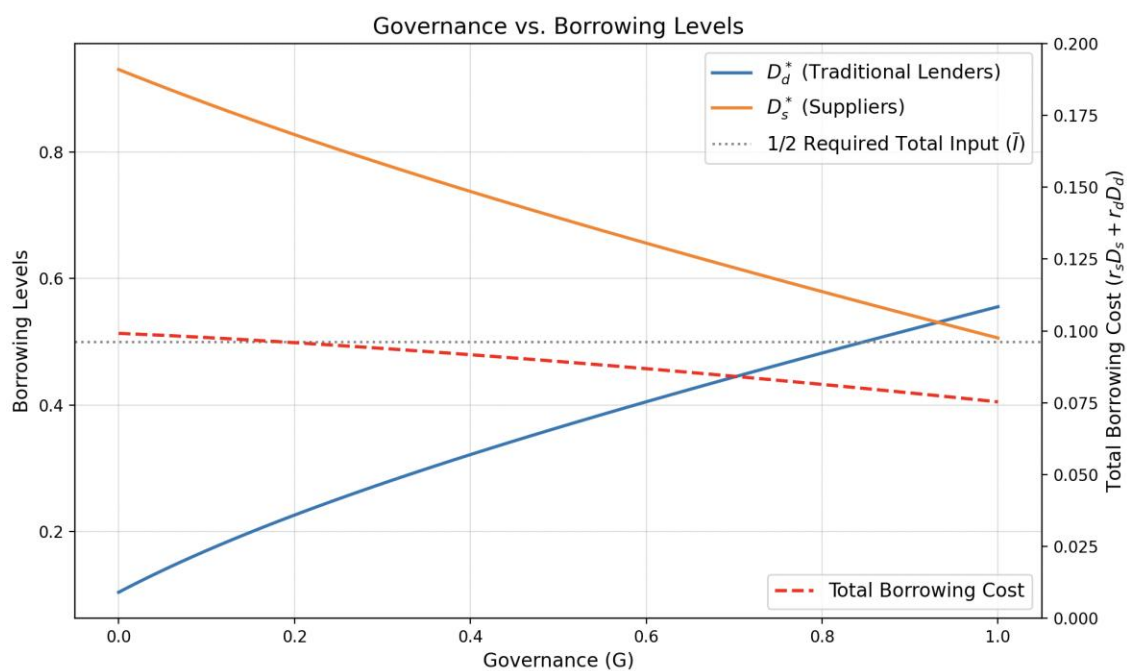


Figure 2. Board reforms and trade credit: Placebo test

This figure plots the density of the coefficient estimates on POST from 1,000 bootstrap simulations of the baseline model used in Column (3) of Table 2. Specifically, similar to Bae et al. (2021), we first construct pseudo-board-reform years by randomly assigning board-governance-reform years to our sample countries during the sample period. We then estimate our baseline regression and repeat this procedure 1,000 times. The red line shows the baseline estimate of the effect of major board reform on trade credit in Column (3) of Table 2.

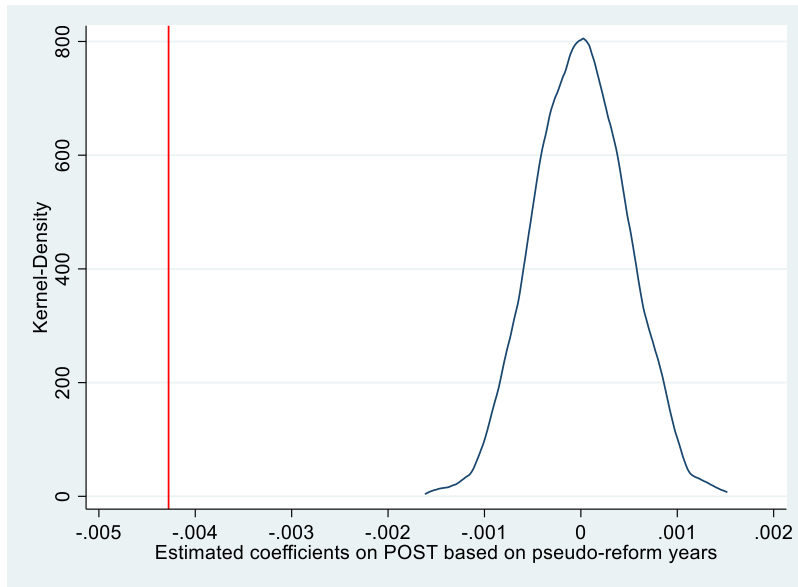
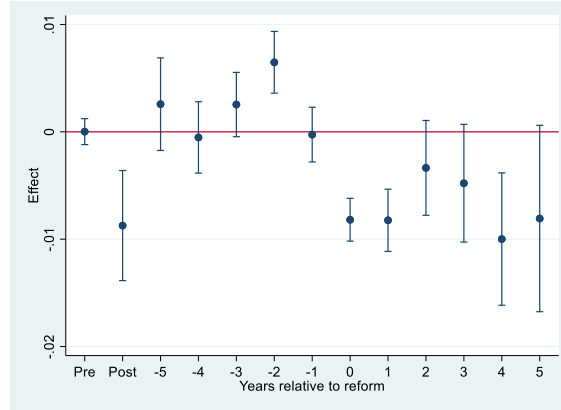
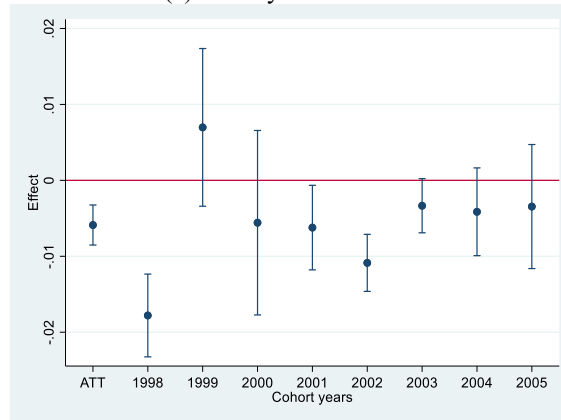


Figure 3. Board reforms and trade credit: Callaway and Sant'Anna (2021) estimator

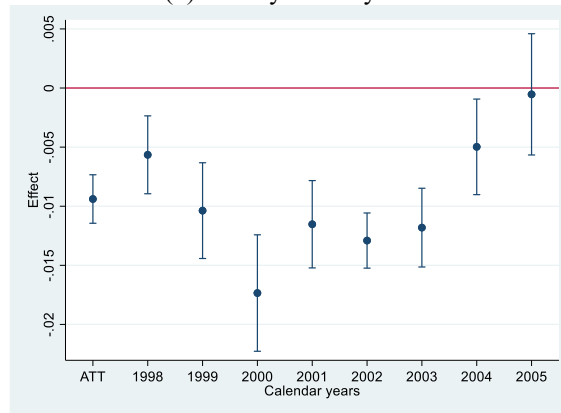
This figure plots the average treatment effect for the treated (ATT) estimated using the Callaway and Sant'Anna (2021) estimator. Figure 3(a) presents the Callaway and Sant'Anna (2021) estimates by relative time within the event window of $[-5, +5]$, where year 0 is the first year the major board reform is effective. Figure 3(b) depicts the Callaway and Sant'Anna (2021) ATT estimates by cohort years. Figure 3(c) shows the Callaway and Sant'Anna (2021) ATT estimates by calendar years. The overall ATT estimates for the pre-treatment period (Pre) and the post-treatment period (Post) are reported. To estimate the ATT, we use not-yet-treated firms as control firms in our full sample and a regression approach without covariates (Baker et al., 2022).



(a) ATT by relative time



(b) ATT by cohort years



(c) ATT by calendar years

Table 1. Descriptive statistics

Panel A presents descriptive statistics and the years of the major board reforms by country (Fauver et al., 2017). Panel B reports the major board reform components by country. Panel C presents the mean, median, standard deviation, first and third quartile values, and the number of observations of key variables employed in the analysis. The baseline sample covers 157,704 firm-year observations for 28,472 unique firms from 38 countries with non-missing values for all control variables. All continuous variables are winsorized at the 1% and 99% levels and defined in Appendix A.

<i>Panel A. Descriptive statistics by country</i>			
Country	No. of firm-years	No. of unique firms	Major board reform year
	(1)	(2)	(3)
Argentina	324	56	2001
Australia	8,608	1,510	2004
Austria	450	86	2004
Belgium	765	128	2005
Brazil	1,683	271	2002
Canada	7,769	1,527	2004
Chile	376	101	2001
China	5,816	1,208	2001
Colombia	114	23	2001
Czech Republic	77	18	2001
Denmark	1,055	164	2001
Finland	464	127	2004
France	3,411	736	2003
Germany	2,908	731	2002
Greece	610	195	2002
Hong Kong SAR	962	130	2005
Hungary	78	21	2003
India	11,286	2,595	2002
Indonesia	601	315	2007
Israel	834	197	2000
Italy	1,728	275	2006
Japan	21,892	3,207	2002
Malaysia	4,744	772	2001
Mexico	647	116	2001
Netherlands	1,044	195	2004
Norway	1,132	227	2005
Pakistan	822	208	2002
Peru	636	77	2005
Philippines	803	133	2002
Poland	874	247	2002
Portugal	174	50	2001
Singapore	3,526	599	2003
South Korea	1,631	375	1999
Spain	948	141	2006

Sweden	1,659	368	2006
Switzerland	1,690	233	2002
United Kingdom	9,893	1,726	1998
United States	55,670	9,384	2003
Total	157,704	28,472	—

Panel B. Major board-reform components by country

Country	Board independence	Audit committee and auditor independence	Separation of CEO and chairman	Approach of reform
	(1)	(2)	(3)	(4)
Argentina	0	1	0	Rules-based
Australia	1	1	1	Comply-or-explain
Austria	1	1	0	Comply-or-explain
Belgium	1	1	1	Comply-or-explain
Brazil	0	0	0	Rules-based
Canada	1	1	1	Rules-based
Chile	0	1	0	Rules-based
China	1	1	0	Rules-based
Colombia	0	0	0	Rules-based
Czech Republic	0	0	0	Rules-based
Denmark	1	0	0	Comply-or-explain
Finland	1	1	1	Comply-or-explain
France	0	1	0	Rules-based
Germany	1	1	0	Comply-or-explain
Greece	1	1	0	Rules-based
Hong Kong SAR	1	1	1	Comply-or-explain
Hungary	0	0	0	Comply-or-explain
India	1	1	0	Rules-based
Indonesia	1	1	0	Rules-based
Israel	1	1	1	Rules-based
Italy	1	1	0	Rules-based
Japan	0	1	0	Rules-based
Malaysia	1	1	0	Comply-or-explain
Mexico	1	1	0	Rules-based
Netherlands	1	1	1	Comply-or-explain
Norway	1	1	1	Comply-or-explain
Pakistan	0	1	0	Comply-or-explain
Peru	1	1	0	Comply-or-explain
Philippines	1	1	0	Comply-or-explain
Poland	1	0	0	Comply-or-explain
Portugal	1	1	0	Rules-based
Singapore	1	1	0	Comply-or-explain
South Korea	1	1	0	Rules-based
Spain	1	1	0	Comply-or-explain

Sweden	1	1	1	Comply-or-explain
Switzerland	0	0	0	Comply-or-explain
United Kingdom	1	1	1	Comply-or-explain
United States	1	1	0	Rules-based

Panel C. Summary statistics

Variable	Mean	Median	Std. Dev.	25th percentile	75th percentile	N
	(1)	(2)	(3)	(4)	(5)	(6)
Trade credit measures						
Payables/Assets	0.119	0.085	0.118	0.041	0.159	157,704
Net payables/Assets	-0.050	-0.045	0.131	-0.117	0.010	157,357
Net payables/COGS	-0.096	-0.081	0.480	-0.206	0.020	141,624
Receivables/Sales	0.191	0.162	0.162	0.095	0.244	156,531
Main variable of interest						
POST	0.565	1.000	0.496	0.000	1.000	157,704
Firm-level control variables						
Ln(SIZE)	4.893	4.918	2.177	3.436	6.324	157,704
Leverage	0.253	0.208	0.252	0.048	0.374	157,704
Sales growth	0.308	0.076	1.181	-0.039	0.259	157,704
Market share	0.054	0.003	0.157	0.000	0.022	157,704
R&D	0.106	0.000	0.520	0.000	0.013	157,704
Capital expenditures	0.059	0.036	0.069	0.016	0.073	157,704
Tangibility	0.307	0.266	0.227	0.117	0.449	157,704
ROA	0.029	0.086	0.285	0.024	0.144	157,704
Inventory	0.141	0.101	0.177	0.021	0.187	157,704
Country-level control variables						
Ln(GDP)	28.660	28.913	1.453	27.645	30.166	157,704
GDP growth	0.035	0.035	0.024	0.018	0.045	157,704
Financial development	1.295	1.377	0.520	0.992	1.716	157,704
Stock market size	0.981	0.843	0.692	0.438	1.401	157,704

Table 2. Board reforms and trade credit: Baseline results

This table presents estimates from difference-in-differences regressions of a firm's trade credit from its suppliers on a dummy variable (POST) that equals one for the five years starting in the year a major board reform is enacted in the country, and zero otherwise, during the 11-year window for the major reform (Fauver et al., 2017). The dependent variable is Payables/Assets, which is calculated as accounts payable (AP) divided by book value of total assets (AT). Robust *t*-statistics clustered at the firm level are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Details on the construction of all variables are provided in Appendix A.

Dependent variable: Payables/Assets	(1)	(2)	(3)
POST	-0.007*** (-8.88)	-0.007*** (-8.99)	-0.004*** (-5.55)
Ln(SIZE)		-0.010*** (-12.78)	-0.011*** (-13.32)
Leverage		0.022*** (7.21)	0.021*** (6.97)
Sales growth		0.001** (2.00)	0.001** (2.14)
Market share		0.009** (2.28)	0.011** (2.56)
R&D		-0.005*** (-3.21)	-0.005*** (-3.19)
Capital expenditures		-0.009* (-1.77)	-0.011** (-2.02)
Tangibility		-0.005 (-1.29)	-0.005 (-1.13)
ROA		-0.038*** (-13.11)	-0.037*** (-12.86)
Inventory		-0.008** (-2.24)	-0.008** (-2.09)
Ln(GDP)			0.040*** (6.04)
GDP growth			-0.036** (-2.42)
Financial development			0.002 (0.88)
Stock market size			0.005*** (6.00)
Firm fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
No. of observations	157,704	157,704	157,704
Adj. R^2	0.74	0.75	0.75

Table 3. Board reforms and trade credit: Robustness tests

This table presents estimates of robustness tests for the effects of board reforms on firms' payables. The dependent variable is Payables/Assets, which is calculated as accounts payable (AP) divided by book value of total assets (AT). Panel A presents results using alternative regression specifications. The variable Years –2 to 0 is a dummy variable that equals one for the 3-year period leading up to the year before the reform becomes effective. The variables Year 1 and Year 2 are dummy variables that equal one if a given year is the first year in which the reform becomes effective and the second effective year of the major board reform of the country respectively, and zero otherwise. Years 3+ is a dummy variable that equals one if a given year is the third year onward (i.e., Year 3, Year 4 and Year 5) after the major board reform of the countries becomes effective, and zero otherwise. The first three pre-reform years (Years -5 to -3) of the countries are omitted as the reference period. POST is a dummy variable that equals one for the five years starting in the year a major board reform is enacted in the country, and zero otherwise, during the 11-year window for the major reform (Fauver et al., 2017). In Column (2), the event-based stacked regression includes not-yet-treated firms during the event window as the control group, following Barrios (2022) and Cengiz et al. (2019). The stacked regression also controls for fixed effects of the interaction of firm and treatment cohort and the interaction of year and treatment cohort. Panel B presents results using alternative sample selection. Column (1) uses an entropy balanced sample. Column (2) uses a balanced sample that requires all firms to have observation in both pre- and post-reform periods. Column (3) uses a full sample without the 11-year window restriction. Column (4) uses a sample excluding U.S. firms. Column (5) uses first board reforms to construct POST. Column (6) uses a sample that consists of WorldScope firms that meet the data requirement. Panel C presents results using alternative measures of trade credit. Net payables is accounts payable (AP) minus accounts receivable (RECTR), or AP-RECT if RECTR is missing. UAP (UAR) stands for unexpected accounts payable (receivable), which is the difference between the actual accounts payable (receivable) and its expected value, scaled by lagged total assets. The expected value is calculated by multiplying the lagged accounts payable (or receivable) by the growth in sales. In Panel D, POST_INDEP (POST_AUDIT and POST_CEOCHAIR) is a dummy variable that equals one for the five years starting in the year a major board reform which covers board independence (audit committee and auditor independence, and separation of the chair and CEO positions, respectively) is effective in the country, and zero otherwise, during the 11-year window for the major reform (Fauver et al., 2017). The regressions include the same set of controls as in Column (3) of Table 2. Robust *t*-statistics clustered at the firm level are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Details on the construction of all variables are provided in Appendix A.

<i>Panel A. Alternative regression specifications</i>				
	Dynamic DID	Stacked regression	Alternative fixed effects	Country and year clustering
Dependent variable: Payables/Assets	(1)	(2)	(3)	(4)
Years –2 to 0	-0.000 (-0.23)			
Year 1	-0.005*** (-3.63)			

Year 2	-0.007*** (-4.14)			
Years 3+	-0.010*** (-5.27)			
POST		-0.005*** (-3.93)	-0.003*** (-4.25)	-0.004** (-2.58)
Control variables	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Subsumed	Yes	Yes
Year fixed effects	Yes	Subsumed	Subsumed	Yes
Industry $\times$ Year fixed effects	No	No	Yes	No
Firm $\times$ Treatment-cohort fixed effects	No	Yes	No	No
Year $\times$ Treatment-cohort fixed effects	No	Yes	No	No
No. of observations	157,704	548,224	157,704	157,704
Adj. R^2	0.75	0.71	0.75	0.75

Panel B. Alternative samples

Dependent variable: Payables/Assets	Entropy balanced	Balanced sample	Full sample	Excluding the U.S.	First board reforms	Worldscope sample
	(1)	(2)	(3)	(4)	(5)	(6)
POST	-0.004*** (-4.93)	-0.003*** (-4.10)	-0.005*** (-6.15)	-0.004*** (-3.58)	-0.004*** (-4.43)	-0.004*** (-5.02)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	157,704	116,613	294,590	102,034	132,476	149,661
Adj. R^2	0.78	0.75	0.71	0.76	0.75	0.76

Panel C. Alternative measures of trade credit

Dependent variable	Net payables/ Assets	Net payables/ COGS	UAP	Receivables/ Sales	UAR
	(1)	(2)	(3)	(4)	(5)
POST	-0.002** (-2.06)	-0.014*** (-2.90)	-0.002** (-2.34)	0.006*** (4.28)	0.003*** (3.88)
Control variables	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
No. of observations	157,357	141,624	157,701	156,531	157,286
Adj. R^2	0.74	0.60	0.18	0.66	0.14

Panel D. Components of major board reform

	Board independence	Audit committee and auditor independence	Separation of CEO and chairman
Dependent variable: Payables/Assets	(1)	(2)	(3)
POST_INDEP	-0.005*** (-5.65)		
POST_AUDIT		-0.005*** (-6.92)	
POST_CEOCHAIR			-0.007*** (-5.25)
Control variables	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
No. of observations	157,704	157,704	157,704
Adj. R^2	0.75	0.75	0.75

Table 4. Role of internal governance

This table presents the results of difference-in-differences regressions of trade credit on board reforms conditional on the level of pre-reform firm-level internal governance. The dependent variable is Payables/Assets, which is calculated as accounts payable (AP) divided by book value of total assets (AT). POST is a dummy variable that equals one for the five years starting in the year a major board reform is enacted in the country, and zero otherwise, during the 11-year window for the major reform (Fauver et al., 2017). LOW_INDEP is a dummy variable that equals one if the proportion of independent directors on the board is lower than the country median in the year prior to the reform, and zero otherwise. Board characteristics are collected from BoardEx, ASSET4, and ISS. LOW_INDEP50 is a dummy variable that equals one if the proportion of independent directors on the board is less than 50% in the year prior to the reform, and zero otherwise. POST_INDEP is a dummy variable that equals one for the five years starting in the year a major board reform which involves board independence is effective in the country, and zero otherwise, during the 11-year window for the major reform (Fauver et al., 2017). The measure of agency cost is the expense ratio (Ang et al., 2000; Chen et al., 2022), calculated as operating expense (the sum of cost of goods sold (COGS) and selling, general and administrative expense (XSGA)), divided by total assets (AT). HIGH_AC is a dummy variable that equals one if a firm's expense ratio is higher than the median value of the country in the year prior to the enactment of major board reforms, and zero otherwise. POST_INDEP (POST_AUDIT and POST_CEOCHAIR) is a dummy variable that equals one for the five years starting in the year a major board reform which covers board independence (audit committee and auditor independence, and separation of the chair and CEO positions, respectively) is effective in the country, and zero for the six years before the major reform (Fauver et al., 2017). The regressions include the same set of controls as in Column (3) of Table 2. Robust *t*-statistics clustered at the firm level are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Details on the construction of all variables are provided in Appendix A.

<i>Panel A. Board independence</i>				
Dependent variable: Payables/Assets	(1)	(2)	(3)	(4)
POST	-0.000 (-0.05)	0.002 (0.96)		
POST × LOW_INDEP	-0.004** (-2.40)			
POST × LOW_INDEP50		-0.006*** (-3.80)		
POST_INDEP			0.001 (0.49)	0.003 (1.42)
POST_INDEP × LOW_INDEP			-0.004** (-2.51)	
POST_INDEP × LOW_INDEP50				-0.007*** (-3.77)
Test for the sum of coefficients = 0 [<i>F</i> -statistic]	-0.004* [3.30]	-0.004** [3.98]	-0.003* [2.57]	-0.004* [3.20]

Control variables	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
No. of observations	18,998	18,998	18,998	18,998
Adj. R^2	0.84	0.85	0.84	0.85

Panel B. Agency costs (AC)

Dependent variable: Payables/Assets	(1)	(2)	(3)	(4)
POST	-0.001 (-1.34)			
POST $\times$ HIGH_AC	-0.004*** (-3.31)			
POST_INDEP		-0.000 (-0.37)		
POST_INDEP $\times$ HIGH_AC		-0.003** (-2.39)		
POST_AUDIT			-0.002** (-2.48)	
POST_AUDIT $\times$ HIGH_AC			-0.004*** (-3.45)	
POST_CEOCHAIR				-0.000 (-0.10)
POST_CEOCHAIR $\times$ HIGH_AC				-0.009*** (-3.18)
Test for the sum of coefficients = 0 [F -statistic]	-0.003*** [19.80]	-0.003*** [8.56]	-0.002*** [29.78]	-0.009*** [13.93]
Control variables	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
No. of observations	106,935	106,935	106,935	106,935
Adj. R^2	0.75	0.75	0.75	0.75

Table 5. Role of external financing environment

This table presents the results of difference-in-differences regressions of trade credit on board reforms conditional on the level of pre-reform country-level external financing environment. The dependent variable is Payables/Assets, which is calculated as accounts payable (AP) divided by book value of total assets (AT). POST is a dummy variable that equals one for the five years starting in the year a major board reform is enacted in the country, and zero otherwise, during the 11-year window for the major reform (Fauver et al., 2017). The level of external financing environment is proxied by the level of a country's financial development (FD) and stock market development (STOCK). HIGH_FD is a dummy variable that equals one if the ratio of domestic credit to private sector as percentage of GDP is above the sample country median in the year prior to the enactment of major board reforms, and zero otherwise. HIGH_STOCK is a dummy variable that equals one if stocks trading volume as percentage of GDP is above the sample country median in the year prior to the enactment of major board reforms, and zero otherwise. Both private credit and stock market size data are collected from the World Bank's World Development Indicators (WDI) database. The regressions include the same set of controls as in Column (3) of Table 2. Robust *t*-statistics clustered at the firm level are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Details on the construction of all variables are provided in Appendix A.

Dependent variable: Payables/Assets	(1)	(2)
POST	0.002 (1.56)	0.003 (1.18)
POST × HIGH_FD	-0.006*** (-4.22)	
POST × HIGH_STOCK		-0.006*** (-2.74)
Test for the sum of coefficients = 0 [<i>F</i> -statistic]	-0.004*** [21.25]	-0.003*** [17.39]
Control variables	Yes	Yes
Firm fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
No. of observations	116,469	114,971
Adj. <i>R</i> ²	0.75	0.75

Table 6. Role of firm financial fragility

This table presents the results of difference-in-differences regressions of trade credit on board reforms conditional on external financing needs, financial constraints, demand uncertainty, and market competition. The dependent variable is Payables/Assets, which is calculated as accounts payable (AP) divided by book value of total assets (AT). POST is a dummy variable that equals one for the five years starting in the year a major board reform is enacted in the country, and zero otherwise, during the 11-year window for the major reform (Fauver et al., 2017). The level of external financing needs is proxied by firm-level financing gap (EFN). The sample is partitioned into high and low subsamples according to the median values of each external financing needs proxy in each country in the year prior to the enactment of major board reforms. The degree of financial constraints is measured by the WW index (Whited and Wu, 2006). The sample is partitioned into constrained and unconstrained subsamples according to the median values of each financial constraint measure in each country in the year prior to the enactment of major board reforms. Demand uncertainty is proxied by demand uncertainty (DEMUNC). DEMUNC is calculated as the standard deviation of annual changes in log-sales over the previous five years, following Irvine et al. (2016). High and low subsamples are split according to the median values of the demand uncertainty measure in each country in the year prior to the enactment of major board reforms. The level of market competition is measured by sales-based Herfindahl-Hirschman Index (HHI). HHI is the Herfindahl-Hirschman index (HHI) of the sales in the 4-digit SIC industry. A lower HHI signifies a more competitive environment. The regressions include the same set of controls as in Column (3) of Table 2. Robust *t*-statistics clustered at the firm level are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Details on the construction of all variables are provided in Appendix A.

<i>Panel A. Sample splits by external financing needs and financial constraints</i>				
	EFN		WW	
Dependent variable:	(1)	(2)	(3)	(4)
Payables/Assets	High	Low	Constrained	Unconstrained
POST	-0.004*** (-2.85)	0.000 (0.19)	-0.005*** (-3.48)	-0.001 (-1.40)
<i>p</i> -value for equality of coefficients	0.012		0.021	
Control variables	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
No. of observations	51,859	55,732	54,465	61,903
Adj. <i>R</i> ²	0.72	0.80	0.69	0.85

<i>Panel B Sample splits by demand uncertainty and market competition</i>				
	DEMUNC		HHI	
Dependent variable:	(1)	(2)	(3)	(4)
Payables/Assets	High	Low	Low	High

POST	-0.005*** (-4.18)	-0.001 (-0.54)	-0.005*** (-4.13)	-0.001 (-0.70)
<i>p</i> -value for equality of coefficients	0.003		0.018	
Control variables	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
No. of observations	56,108	60,338	59,288	57,181
Adj. R^2	0.71	0.82	0.75	0.76

Table 7. Board reforms and firm investment

Panel A of this table presents the results of difference-in-differences regressions of firm investment on board reforms. Firm investment is proxied by capital investment (Capex), non-capital investment (Non-Capex), and total investment (Total Investment). Capex is capital expenditure (CAPX) less cash receipts from the sale of property, plant, and equipment (SPPIV), scaled by lagged total assets (AT). Non-Capex is the sum of R&D expenses (XRD), acquisitions (AQC), and advertising expenses (XAD), scaled by lagged total assets (AT). Total Investment is the sum of Capex and Non-Capex. In Panel B, the sample is partitioned based on proxies for firm financial fragility: external financing needs (EFN), financial constraints (WW), demand uncertainty (DEMUNC), and market competition (HHI). The sample is split according to the median values of the firm financial fragility measure in each country in the year prior to the enactment of major board reforms. The regressions include the same set of controls as in Panel A. All control variables are lagged except for cash flow. Robust *t*-statistics clustered at the firm level are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Details on the construction of all variables are provided in Appendix A.

<i>Panel A. Board reforms and firm investment</i>			
Dependent variable	Capex	Non-Capex	Total Investment
	(1)	(2)	(3)
POST	0.007*** (6.13)	0.007*** (5.40)	0.015*** (7.59)
Tobin's q	0.004*** (18.88)	0.004*** (12.34)	0.010*** (18.85)
Cash flow	0.019*** (7.31)	-0.072*** (-18.76)	-0.067*** (-11.58)
Ln(SIZE)	-0.028*** (-25.67)	-0.042*** (-26.26)	-0.081*** (-35.54)
Tangibility	-0.022*** (-3.36)	0.063*** (8.80)	0.030** (2.57)
Leverage	-0.029*** (-8.11)	-0.049*** (-9.14)	-0.078*** (-9.81)
Cash	0.022*** (5.00)	0.061*** (9.13)	0.084*** (8.72)
Δ Equity	0.002*** (4.46)	-0.000 (-0.18)	0.003** (2.49)
Δ Debt	0.017*** (7.90)	0.006** (2.09)	0.023*** (5.07)
Ln(GDP)	0.045*** (4.79)	0.013* (1.76)	0.073*** (5.15)
GDP growth	0.160*** (7.42)	0.120*** (5.38)	0.273*** (7.55)
Financial development	0.003 (1.12)	0.005* (1.87)	0.013*** (2.78)
Stock market size	0.008*** (7.73)	-0.008*** (-5.84)	0.001 (0.66)

Firm fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
No. of observations	129,380	129,380	129,380
Adj. R^2	0.48	0.54	0.48

Panel B. Sample splits by external financing needs and financial constraints

	EFN		WW	
Dependent variable:	(1)	(2)	(3)	(4)
Total Investment	High	Low	Constrained	Unconstrained
POST	0.033*** (10.16)	-0.004 (-1.22)	0.022*** (6.44)	0.002 (0.85)
p -value for equality of coefficients	0.000		0.000	
Control variables	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
No. of observations	43,031	47,143	44,109	50,414
Adj. R^2	0.54	0.37	0.51	0.35

Panel C. Sample splits by demand uncertainty and market competition

	DEMUNC		HHI	
Dependent variable:	(1)	(2)	(3)	(4)
Total Investment	High	Low	Low	High
POST	0.016*** (4.71)	0.009*** (3.99)	0.019*** (5.75)	0.011*** (4.14)
p -value for equality of coefficients	0.084		0.047	
Control variables	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
No. of observations	45,067	49,329	46,611	50,235
Adj. R^2	0.48	0.38	0.48	0.46

Table 8. Board reforms and firm performance

This table presents the results of difference-in-differences regressions of firm operating performance on board reforms conditional on agency costs (AC), external financing needs (EFN), financial constraints (WW), demand uncertainty (DEMUNC), and market competition (HHI). The dependent variable is firm performance, which is proxied by return on assets (ROA). ROA is calculated as earnings before interest, taxes, depreciation, and amortization (EBITDA) divided by book value of total assets (AT). POST is a dummy variable that equals one for the five years starting in the year a major board reform is enacted in the country, and zero otherwise, during the 11-year window for the major reform (Fauver et al., 2017). HIGH_AC is a dummy variable that equals one if a firm's expense ratio is higher than the median value of the country in the year prior to the enactment of major board reforms, and zero otherwise. The regressions include the same set of controls as in Column (3) of Table 2. Robust *t*-statistics clustered at the firm level are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Details on the construction of all variables are provided in Appendix A.

<i>Panel A. Agency cost and external financing needs</i>			
Dependent variable: ROA	(1)	(2)	(3)
POST	0.006** (2.51)	-0.002 (-0.69)	-0.003 (-1.16)
POST × HIGH_AC		0.008*** (2.58)	
POST × HIGH_EFN			0.016*** (4.91)
Test for the sum of coefficients = 0 [<i>F</i> -statistic]		0.006* [3.66]	0.013*** [14.92]
Control variables	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
No. of observations	154,137	106,658	107,479
Adj. <i>R</i> ²	0.68	0.64	0.65

<i>Panel B. Financial constraints, demand uncertainty, and market competition</i>			
Dependent variable: ROA	(1)	(2)	(3)
POST	-0.005** (-2.10)	-0.006** (-2.47)	-0.001 (-0.46)
POST × HIGH_WW	0.016*** (4.99)		
POST × HIGH_DEMUNC		0.018*** (5.68)	
POST × LOW_HHI			0.009*** (2.90)

Test for the sum of coefficients = 0 [<i>F</i> -statistic]	0.011*** [11.57]	0.012*** [13.95]	0.008*** [6.82]
Control variables	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
No. of observations	116,264	116,320	116,342
Adj. R^2	0.65	0.65	0.65

Table 9. Role of external governance

This table presents the results of difference-in-differences regressions of trade credit on board reforms conditional on the level of pre-reform country-level external governance. The dependent variable is Payables/Assets, which is calculated as accounts payable (AP) divided by book value of total assets (AT). POST is a dummy variable that equals one for the five years starting in the year a major board reform is enacted in the country, and zero otherwise, during the 11-year window for the major reform (Fauver et al., 2017). HIGH_WGI is a dummy variable that equals one if the World Bank's Worldwide Governance Indicators (WGI) is above the sample country median in the year prior to the enactment of major board reforms, and zero otherwise. WGI is an annual average of the six governance indicators: 1) voice and accountability, 2) political stability and absence of violence/terrorism, 3) government effectiveness, 4) regulatory quality, 5) rule of law, and 6) control of corruption. A higher score of WGI indicates better governance quality. HIGH_CONT_ENF is a dummy variable that equals one if the World Bank's enforcing contracts indicator is above the sample country median in the year prior to the enactment of major board reforms, and zero otherwise. The enforcing contracts indicator measures the time and cost for resolving a commercial dispute through a local first-instance court, and the quality of judicial processes index. The indicator is calculated as the average of the scores for Time (days), Cost (% of claim value) and Procedures (number). The score ranges from 0 to 100, with 100 the best regulatory performance. HIGH_TRUST is a dummy variable that equals one if the World Values Survey's (WVS) social trust score is above the sample country median in the year prior to the enactment of major board reforms, and zero otherwise. The social trust measure is calculated as the percentage of respondents in each country choosing the option of "most people can be trusted." The survey asks the question: "Generally speaking, would you say that most people can be trusted, or that you need to be very careful in dealing with people?" The WVS offers three possible responses: i) most people can be trusted; ii) you need to be very careful in dealing with other people; and iii) I don't know. The regressions include the same set of controls as in Column (3) of Table 2. Robust *t*-statistics clustered at the firm level are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Details on the construction of all variables are provided in Appendix A.

Dependent variable: Payables/Assets	(1)	(2)	(3)
POST	0.003* (1.87)	0.001 (0.65)	0.002 (1.42)
POST × HIGH_WGI	-0.007*** (-4.65)		
POST × HIGH_CONT_ENF		-0.005*** (-3.16)	
POST × HIGH_TRUST			-0.006*** (-3.90)
Test for the sum of coefficients = 0 [<i>F</i> -statistic]	-0.004*** [24.25]	-0.004*** [20.69]	-0.004*** [20.12]
Control variables	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes

Year fixed effects	Yes	Yes	Yes
No. of observations	116,469	116,469	108,574
Adj. R^2	0.75	0.75	0.75

Appendix A. Variable definitions

This table provides the definition of the variables used in the study.

Definitions with corresponding Compustat item names	
Trade credit measures	
Payables/Assets	Accounts payable (AP) divided by book value of total assets (AT)
Net payables/Assets	Accounts payable (AP) minus accounts receivable (RECTR), divided by book value of total assets (AT). Replace RECTR with total receivables (RECT) if RECTR is missing.
Net payables/COGS	Accounts payable (AP) minus accounts receivable (RECTR), divided by cost of goods sold (COGS). Replace RECTR with total receivables (RECT) if RECTR is missing.
Receivables/Sales	Accounts receivable (RECTR), divided by sales (SALE). Replace RECTR with total receivables (RECT) if RECTR is missing.
UAP	Unexpected accounts payable, which is the difference between the actual accounts payable and its expected value, scaled by lagged total assets (Mulford and Comiskey, 2002, p. 187; Marquardt and Wiedman, 2004; Arcas and Martí, 2016). The expected value is calculated by multiplying the lagged accounts payable by the growth in sales. $UAP_{i,t} = \frac{AP_{i,t} - \left(AP_{i,t-1} \times \frac{SALE_{i,t}}{SALE_{i,t-1}} \right)}{AT_{i,t-1}}$.
UAR	Unexpected accounts receivable, which is the difference between the actual accounts receivable and its expected value, scaled by lagged total assets (Mulford and Comiskey, 2002, p. 187; Marquardt and Wiedman, 2004; Arcas and Martí, 2016). The expected value is calculated by multiplying the lagged accounts receivable by the growth in sales. $UAR_{i,t} = \frac{AR_{i,t} - \left(AR_{i,t-1} \times \frac{SALE_{i,t}}{SALE_{i,t-1}} \right)}{AT_{i,t-1}}$.
Main variable of interest	
POST	An indicator variable, which equals one for the five years starting in the year a major board reform is enacted in the country, and zero otherwise, during the 11-year window for the major reform (Fauver et al., 2017).
POST_INDEP	An indicator variable, which equals one for the five years starting in the year a major board reform which involves board independence is effective in the country, and zero otherwise, during the 11-year window for the major reform (Fauver et al., 2017).
POST_AUDIT	An indicator variable, which equals one for the five years starting in the year a major board reform which covers audit committee and auditor independence is effective in the country, and zero otherwise, during the 11-year window for the major reform (Fauver et al., 2017).
POST_CEOCHAIR	An indicator variable, which equals one for the five years starting in the year a major board reform which covers separation of the chair and CEO positions is effective in the country, and zero otherwise, during the 11-year window for the major reform (Fauver et al., 2017).

Firm-level control variables	
Ln(SIZE)	Natural logarithm of book value of total assets (AT) in millions of 2006 U.S. dollars.
Leverage	The ratio of long-term debt (DLTT) plus debt in current liabilities (DLC) to book value of total assets (AT).
Sales growth	Change in sales (SALE) divided by the one-year lagged sales.
Market share	The ratio of the firm's sales (SALE) over total industry sales, where industry classification is based on Fama and French's 48 industries.
R&D	The ratio of R&D expenditure (XRD) to sales (SALE). If R&D expenditure is missing, we follow the tradition to set the missing value to zero.
Capital expenditures	The ratio of capital expenditures for property, plant, and equipment (CAPX) to book value of total assets (AT).
Tangibility	Net property plant and equipment (PPENT) over book value of total assets (AT).
ROA	Operating income before depreciation (OIBDP) divided by book value of total assets (AT).
Inventory	Total inventories (INVT) divided by sales (SALE).
Country-level control variables	
Ln(GDP)	The natural logarithm of country gross domestic product in constant 2015 US dollars. Data source: World Bank's World Development Indicators (WDI) database.
GDP growth	The annual growth rate of gross domestic product.
Financial development	Domestic credit provided to the private sector as percent of GDP. Data source: World Bank's World Development Indicators (WDI) database.
Stock market size	Stocks value traded as percent of GDP. Data source: World Bank's World Development Indicators (WDI) database.
Other firm-level variables	
LOW_INDEP	An indicator variable that equals one if the proportion of independent directors on the board is lower than the country median in the year prior to the reform, and zero otherwise. Data source: BoardEx, ASSET4, and ISS.
LOW_INDEP50	An indicator variable that equals one if the proportion of independent directors on the board is less than 50% in the year prior to the reform, and zero otherwise. Data source: BoardEx, ASSET4, and ISS.
HIGH_AC	An indicator variable that equals one if a firm's expense ratio is higher than the median value of the country in the year prior to the enactment of major board reforms, and zero otherwise. Following Ang et al. (2000) and Chen et al. (2022), the expense ratio is calculated as operating expense (the sum of cost of goods sold (COGS) and selling, general and administrative expense (XSGA)), divided by book value of total assets (AT).

EFN	A flow measure of firm-level financing gap, calculated as the difference between net cash flow from investing activities and net cash flow from operating activities, deflated by book value of total assets (AT).
WW index	A financial constraint index based on Whited and Wu (2006), calculated as $(-0.091 \times CF) - (0.062 \times \text{DIVPOS}) + (0.021 \times \text{TLTD}) - (0.044 \times \text{LNTA}) + (0.102 \times \text{ISG}) - (0.035 \times \text{SG})$, where CF is the ratio of cash flow (IB+DP) to total assets (AT); DIVPOS is an indicator that equals one if the firm pays cash dividends; TLTD is the ratio of the long-term debt to total assets (DLTT/AT); LNTA is the natural logarithm of total book assets (AT), ISG is the average sales growth in the firm's three-digit industry in each country each year; SG is the firm's sales growth.
DEMUNC	Demand uncertainty, calculated as the standard deviation of annual changes in log-sales over the previous five years, following Irvine et al. (2016).
HHI	Sales-based Herfindahl-Hirschman Index in the 4-digit SIC industry.
Capex	Capital expenditure (CAPX) less cash receipts from the sale of property, plant, and equipment (SPPIV), scaled by lagged book value of total assets (AT).
Non-Capex	The sum of R&D expenses (XRD), acquisitions (AQC), and advertising expenses (XAD), scaled by lagged book value of total assets (AT). Missing values of XRD are replaced by zero.
Total Investment	The sum of Capex and Non-Capex.
Tobin's q	Book value of total assets (AT) minus book value of equity (CEQ) plus market value of equity ($\text{PRCC_F} \times \text{CSHO}$), scaled by book value of total assets (AT).
Cash flow	Income before extraordinary items (IB) plus depreciation and amortization (DP), scaled by lagged book value of total assets (AT).
Cash	Cash and short-term investments (CHE) scaled by book value of total assets (AT).
Δ Equity	The change in the sum of the book value of equity (SEQ) and the deferred taxes (TXDI), minus the change in retained earnings (RE), scaled by lagged book value of total assets (AT), following Larkin et al. (2018).
Δ Debt	The change in the total debt (DLTT+DLC) scaled by lagged book value of total assets (AT), following Larkin et al. (2018).

Other country-level variables

HIGH_WGI	An indicator variable that equals one if a country's Worldwide Governance Indicators (WGI) index is above the sample country median in the year prior to the enactment of major board reforms, and zero otherwise. WGI is an annual average of the six governance indicators: 1) voice and accountability, 2) political stability and absence of violence/terrorism, 3) government effectiveness, 4) regulatory quality, 5) rule of law, and 6) control of corruption. A higher score of WGI indicates better governance quality. Data source: World Bank's World Development Indicators (WDI) database.
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HIGH_CONT_ENF	An indicator variable that equals one if a country's enforcing contracts indicator is above the sample country median in the year prior to the enactment of major board reforms, and zero otherwise. The enforcing contracts indicator measures the time and cost for resolving a commercial dispute through a local first-instance court, and the quality of judicial processes index. The indicator is calculated as the average of the scores for Time (days), Cost (% of claim value) and Procedures (number). The score ranges from 0 to 100, with 100 the best regulatory performance. Data source: World Bank's World Development Indicators (WDI) database.
HIGH_TRUST	An indicator variable that equals one if a country's social trust score is above the sample country median in the year prior to the enactment of major board reforms, and zero otherwise. The social trust measure is calculated as the percentage of respondents in each country choosing the option of "most people can be trusted." The survey asks the question: "Generally speaking, would you say that most people can be trusted, or that you need to be very careful in dealing with people?" The WVS offers three possible responses: i) most people can be trusted; ii) you need to be very careful in dealing with other people; and iii) I don't know. Data source: World Values Survey (WVS) database.
HIGH_FD	An indicator variable that equals one if the ratio of domestic credit to private sector as percentage of GDP is above the sample country median in the year prior to the enactment of major board reforms, and zero otherwise. Data source: World Bank's World Development Indicators (WDI) database.
HIGH_STOCK	An indicator variable that equals one if stocks trading volume as percentage of GDP is above the sample country median in the year prior to the enactment of major board reforms, and zero otherwise. Data source: World Bank's World Development Indicators (WDI) database.

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