

Languages and Dividend Smoothing

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Abstract

Using a global sample of publicly listed firms from 1997 to 2022, this study examines how linguistic heterogeneity shapes corporate dividend smoothing. Based on the strength of Future Time Reference (FTR), the grammatical marking of future time, we classify countries into strong-FTR and weak-FTR language groups. Differences in linguistic structure may influence decision-makers' perceptions of time and behavioral tendencies. In particular, speakers of weak-FTR languages tend to perceive the future as more imminent and thus place greater emphasis on preparing for future outcomes, which may affect both managerial payout decisions and investors' dividend preferences. Empirically, we find that firms headquartered in countries with weak FTR language adjust their dividends more frequently and exhibit lower dividend smoothing than firms in countries with strong FTR language. These findings suggest that when the future is perceived as psychologically closer, managers may prioritize investment and adjust payouts more actively under a residual dividend policy, while investors may prefer receiving cash sooner, consistent with the dividend catering hypothesis. Our results remain robust after controlling for an extensive set of firm- and country-level determinants, including firm characteristics, market development, legal institutions, corporate governance, religion, and broader cultural factors, and are further supported by a battery of robustness checks. Additional analyses show that the language effect is stronger in settings with stronger governance mechanisms and after 2008 financial crisis. This study extends the growing literature on language and corporate policies by providing new evidence that linguistic structure is systematically related to corporate dividend smoothing and offers a novel perspective on cross-country variation in dividend payout policy.

Keywords: Language, Dividend smoothing, Speed of dividend adjustments, Dividend payout

EFM Classification Codes: 110, 150, 170

1. Introduction

Dividend payout policy refers to a firm's decisions regarding how profits are distributed to shareholders and how these distributions are implemented. Dividend payouts require sufficient profitability and directly affect shareholder wealth and firm value, making dividend policy one of the firm's most important financial decisions. In setting dividend payout policy, managers must balance operating performance and financing needs with shareholders' preferences and expectations to ensure that payout decisions are consistent with shareholder interests. Dividend smoothing represents a stable payout policy aimed at avoiding dividend cuts or omissions, and, in some cases, prioritizing dividend payments over other financial decisions such as investment. A smooth dividend policy signals strong and stable profitability and may help mitigate agency problems. As Knyazeva and Knyazeva (2014) note, "stable dividends constrain managerial discretion and the free cash flow available to managers." Accordingly, dividend smoothing provides insight into managers' incentives and commitment to maintaining ongoing dividend payments.

Prior research identifies several determinants of corporate dividend smoothing, emphasizing firm characteristics, industry competition, and country-level environments. From the perspectives of financial constraints, information asymmetry, and agency conflicts, Leary and Michaely (2011) document that dividend smoothing is lower among younger and smaller firms, and among firms with lower dividend yields and more volatile earnings and stock returns. Extending the analysis to the global setting, Javakhadze, Ferris, and Sen (2014) show that firms with lower market-to-book ratios, lower cash holdings, and firms operating in more competitive industries exhibit greater dividend smoothing. They further find that smoothing is stronger in countries characterized by lower power distance and higher individualism, masculinity, uncertainty avoidance, and long-term orientation, whereas firms with high ownership concentration and stronger internal governance, as well as firms located in countries with stronger shareholder legal protection, engage in less dividend smoothing.

Dividend smoothing may also have distinct valuation implications. For example, Brockman et al. (2022) show that the dividend capitalization value is significantly higher for firms with greater smoothing, and that the dividend-smoothing premium is more pronounced in countries with weaker shareholder protection. These findings suggest that dividend smoothing can serve as a substitute mechanism for mitigating agency costs and may reflect a form of dividend catering. If smoothing constitutes catering, it should be closely related to managerial and investor preferences for dividend stability.

A growing body of literature examines how linguistic heterogeneity influences corporate policies, including dividend policy; however, existing evidence focuses almost exclusively on dividend payout ratios, rather than dividend smoothing. Linguistic heterogeneity is typically captured by the strength of Future Time Reference (FTR), whether a language grammatically separates the future from the present using explicit future tense (strong-FTR) or relies more on present-tense constructions (weak-FTR). Such differences shape individuals' time perception and psychological distance to the future. In particular, speakers of strong-FTR languages tend to perceive the future as more distant, which can influence both investors and corporate decision-makers, ultimately affecting dividend preferences and payout decisions.

Empirical evidence on FTR and dividend payout ratios is informative, but the findings are mixed. Chen et al. (2017) find that firms in countries with weak-FTR language hold higher levels of precautionary cash, and argue that this additional cash source stems from greater debt issuance, lower investment (capital expenditures), and lower interest payments and dividend payouts. However, their empirical evidence shows higher dividend payments. Wang (2019) finds that shareholders in weak-FTR countries prefer holding cash earlier, and firms cater to this preference by paying higher dividends. In contrast, He and Zhang (2022) and Nishikawa, Joo, and Parhizgar (2023) argue that weak-FTR language environments emphasize longer-horizon activities such as future cash flows, implying that weak-FTR firms may pay lower dividends to sustain capital expenditure. Overall, while this literature suggests that language structure helps explain cross-country variation in dividend payouts, the findings are not fully consistent regarding the direction of the effect.

This study extends prior work by shifting attention from dividend payout ratios to dividend smoothing, defined as firms' tendency to avoid dividend cuts or omissions and maintain a stable payout path conditional on paying dividends. We examine whether linguistic structure affects the degree of dividend smoothing and assess whether the competing predictions in the FTR-payout literature remain valid when focusing on dividend adjustment behavior. By doing so, we provide a new perspective on how language-based cultural traits shape corporate payout policies and contribute to the emerging literature on linguistic heterogeneity and corporate financial decision-making.

These linguistic differences influence both investors' and firms' attitudes toward the future, which are subsequently reflected in their dividend preferences and payout decisions. Following Chen et al. (2017) and Nishikawa, Joo, and Parhizgar (2023), firms in weak-FTR language countries tend to retain more cash as a precautionary buffer against

uncertainty and thus make more conservative payout decisions. This argument implies that weak-FTR firms are more likely to follow stable dividend policies and exhibit greater dividend smoothing.

In contrast, He and Zhang (2022) suggest that weak-FTR firms prioritize investment financing and therefore follow a residual dividend policy, implying less dividend smoothing. Additionally, from an investor-preference perspective, Wang (2019) argues that investors in weak-FTR countries value holding cash earlier to hedge future risks. Consistent with dividend catering theory, firms may respond by adjusting dividends more closely with current profitability, which implies lower dividend smoothing. Accordingly, we also consider the competing prediction that firms in weak-FTR language countries exhibit less dividend smoothing.

To examine the effect of language structure on dividend smoothing, we assemble a large cross-country sample of firms from 42 countries over 1997-2022. Our empirical results show that firms located in weak-FTR language environments exhibit lower dividend smoothing (i.e., faster dividend adjustment). This evidence is consistent with the view that weak-FTR firms are more likely to follow a residual dividend policy while simultaneously catering to investors' preference for immediate earnings distributions. The association remains robust after controlling for a broad set of cultural factors, including religious composition, country-level trust, and Hofstede's cultural dimensions, as well as when using alternative measures of dividend smoothing and linguistic structure, employing different estimation methods, and conducting tests on alternative samples.

We further conduct extension analyses by examining whether the language effect varies with external conditions such as corporate governance quality and financial crises. For corporate governance, we exploit cross-country variation in board reforms and investor protection (proxied by shareholder rights indices) to distinguish stronger versus weaker governance environments. The results indicate that the negative relationship between language structure and dividend smoothing is more pronounced in the post-board reform period and in countries with stronger shareholder protection.

We also partition the sample around the 2008 global financial crisis and find that the negative effect of language on dividend smoothing becomes stronger after the crisis. This pattern suggests that heightened risk awareness following the crisis amplifies investors' demand for timely cash distributions, thereby strengthening firms' dividend-catering incentives and leading to less dividend smoothing.

Our study provides three contributions to the literature. First, prior theoretical and

empirical studies have examined the variation in dividend smoothing across firms and countries through the perspectives of information asymmetry, agency problems, and financial constraints (Guttman, Kadan, and Kandel, 2010; Leary and Michaely, 2011; Javakhadze, Ferris, and Sen, 2014). Our research employs a unique approach that focuses on linguistic heterogeneity that can influence corporate and investor dividend preferences. By exploring the differences in time perception resulting from the language people use, we provide new evidence that companies in weak FTR languages adopt residual dividend policies that prioritize investment, while catering to investors who prefer to receive earnings distributions as quickly as possible, thus playing a significant role in the preference for dividend smoothing.

Second, we contribute to the growing literature on linguistic heterogeneity and corporate policies. Prior studies show that language structure is associated with corporate outcomes such as cash holdings (Chen et al., 2017), earnings management (Kim, Kim, and Zhou, 2017), corporate social responsibility (Liang et al., 2014), and innovation activity (Chi et al., 2021; Kong et al., 2021). Related work also links linguistic structure to dividend payout policies (e.g., He and Zhang, 2022; Nishikawa, Joo, and Parhizgar, 2023). Building on this stream, our study provides new evidence that language structure also systematically influences corporate dividend smoothing.

Finally, this study is the first to provide a more comprehensive explanation and verification of the relationship between language heterogeneity and corporate dividend smoothing from the perspective of the company and its shareholders, using both residual dividend policy and dividend catering theory.

The rest of the paper proceeds as follows. The second section discusses related literature and develops the hypotheses. The third section describes our sample and methodology. The fourth section reports the empirical results. The last section concludes.

2. Literature review and hypotheses development

2.1. Linguistic literature

According to linguistic literature on linguistic relativity, also known as the Sapir–Whorf hypothesis, linguistic structure may shape speakers’ cognition and worldview, leading to differences in thought and behavior among speakers of different languages (Whorf, Carroll, and Chase, 1956). This study examines how grammatical differences influence time perception. Prior research shows that languages with strong future time reference (FTR) require explicit future tense marking, as in English (will, be going to),

whereas languages with weak FTR, such as Chinese, Japanese, and German, often express future events using the present tense (Dahl, 2000).

Dahl (2000) and Thieroff (2000) find that using future tense when describing future events (strong-FTR language) increases individuals' perceived psychological distance toward the future, making it feel more distant and thereby reducing the perceived importance of future outcomes. Consistent with this finding, Chen (2013) provides evidence that using the present tense to describe future events (weak-FTR language) decreases psychological distance, making the future feel closer. Consequently, speakers of weak-FTR languages tend to worry more about the future and are more likely to engage in future-oriented behaviors, such as exercising to protect their future health and saving more for retirement, leading to greater financial security later in life. Similarly, Sutter et al. (2015), using data from a bilingual city in northern Italy, show that elementary school students whose mother tongue is German (a weak-FTR language) are more likely to delay gratification than those whose mother tongue is Italian (a strong-FTR language). Taken together, these findings suggest that speakers of weak-FTR languages may perceive a year as a shorter period of time compared to speakers of strong-FTR languages. Moreover, individuals speaking weak-FTR languages tend to have a fuzzier perception of future time, whereas speakers of strong-FTR languages perceive future events in a more temporally precise manner.

Other studies on future-oriented activities have reported similar findings. Liang et al. (2014) find that firms located in countries where strong-FTR languages are the official languages perform worse in future-oriented activities, such as corporate social responsibility (CSR) engagement, than those in weak-FTR language countries. Chen et al. (2017) posit that describing future events in the present tense may lead individuals to believe that adverse credit events are imminent; accordingly, they document that firms in weak-FTR language countries hold higher levels of precautionary cash on average. Similarly, Kim, Kim, and Zhou (2017) show that firms in weak-FTR language countries engage less in both discretionary accrual-based and real earnings management. This suggests that managers in weak-FTR language environments may perceive the future consequences of earnings management as more immediate, and thus refrain from such activities to avoid potential future costs.

Chi et al. (2020) further demonstrate that a fuzzier perception of future time associated with FTR languages leads to higher levels of R&D investment and innovation. Consistently, Kong et al. (2021) find that firms in strong-FTR language countries have fewer patents and patent citations. They also show that strong-FTR languages influence

inventors' beliefs and expectations about the future rewards of innovation, while globalization mitigates the negative effect of strong-FTR languages on innovation. These findings suggest that firms operating in strong-FTR language environments may perceive the future as more distant, leading them to be less concerned about or less optimistic regarding the potential future returns on innovation.

Overall, the above evidence reinforces that linguistic structure shapes individuals' and organizations' perceptions of time. While speakers of weak-FTR languages may engage in precautionary behaviors, such as saving or avoiding actions with adverse future consequences, because they are more concerned about the near future, they may also be more willing to invest and innovate due to a stronger belief in the imminence of future gains. Nevertheless, research examining how language affects corporate policies remains in its infancy, leaving ample room for further investigation.

2.2. Dividend smoothing literature

The concept of dividend smoothing was first introduced by Lintner (1956), who documented that managers tend to adopt a stable dividend payout policy with a long-term target payout ratio. Managers gradually adjust dividends toward the target level after considering the sustainability of newly set dividends, while avoiding dividend cuts or omissions whenever possible. Lintner also argues that dividend policy often takes precedence over other financial decisions, such as investment choices. In contrast, Miller and Modigliani (1961) propose that firms prioritize investment and liquidity needs over dividend payments, implying that companies follow a residual dividend policy. Recently, Chasiotis et al. (2021) showed that heightened climate risk weakens dividend-smoothing behavior. Their findings indicate that climate risk reduces the likelihood of dividend payments and increases the tendency to alter or omit dividends. This suggests that when facing higher climate-related uncertainty, firms are more likely to prioritize investment over dividend distribution, shifting from dividend smoothing toward a more flexible payout policy, residual dividend payout policy.

Furthermore, the theoretical foundations of dividend smoothing are rooted in agency costs, information asymmetry, and financial constraints. Dividend smoothing can be viewed as a mechanism to mitigate the agency costs of free cash flow (Easterbrook, 1984; Allen et al., 2000; DeAngelo and DeAngelo, 2007; Leary and Michael, 2011), or alternatively, as an outcome of agency problems (Lambrecht and Myers, 2012). In the presence of information asymmetry, a stable stream of dividends can serve as a credible signal of firms' true profitability (Fudenberg and Tirole, 1995; Kumar and Lee, 2001; Guttman, Kadan, and Kandel, 2010). From the perspective of precautionary savings,

financially constrained firms are less likely to increase dividends even after earnings improve, implying that they maintain smooth dividend payments to preserve financial flexibility (Almeida et al., 2004; Bates et al., 2009).

Javakhadze, Ferris, and Sen (2014) conduct a global empirical analysis of the determinants of dividend smoothing based on agency theory and information asymmetry. Their results show that managers are more likely to engage in greater dividend smoothing in firms with lower market-to-book ratios, lower cash holdings, and those operating in highly competitive industries. Similarly, firms located in countries characterized by low power distance but high levels of individualism, masculinity, uncertainty avoidance, and long-term orientation also exhibit stronger smoothing behavior. In contrast, firms with highly concentrated ownership structures, stronger corporate governance, and those located in countries with higher levels of shareholder protection tend to smooth dividends less. These findings suggest that the degree of dividend smoothing varies substantially across firms and countries, influenced not only by legal and cultural environments but also by firm- and industry-specific characteristics. Managers appear to consider both agency problems and information asymmetry effects when making dividend-smoothing decisions. Consistent with this view, Leary and Michael (2011) show that dividend smoothing is most prevalent among firms that are more exposed to agency conflicts, financially unconstrained, and subject to lower levels of information asymmetry. Although their findings differ in terms of the roles of financial constraints and asymmetric information, from another perspective, firms with fewer informational frictions or financial constraints may also engage in dividend smoothing as a means to attract and reassure investors.

The rent extraction hypothesis suggests that, relative to strong shareholder protection environments with lower agency costs, investors in weak shareholder protection environments, characterized by higher agency costs, are less willing to pay a premium for firms exhibiting high levels of dividend smoothing. In contrast, the bonding hypothesis predicts that, compared to strong protection environments, investors are more willing to pay higher of firms that smooth dividends in weak protection environments. As Knyazeva and Knyazeva (2014) note, “stable dividends constrain managerial discretion and the free cash flow available to managers.” Their findings support the view that managers generally believe investors prefer a stable stream of dividend payments (Brav et al., 2005), which helps explain why managers are willing to incur the costs associated with maintaining dividend stability. Taken together, these studies suggest that investors may perceive firms with smoother dividend policies as more reliable and less risky. Accordingly, managers may choose to smooth dividends either to enhance firm value or to cater to investors’

preferences for stability. Consistent with this notion, Brockman et al. (2022) show that the value capitalization of dividends is significantly higher for firms with greater smoothing, and that the dividend-smoothing premium is more pronounced in countries with weaker shareholder protection. These results indicate that dividend smoothing can serve as a substitute mechanism for mitigating agency costs, thereby lending support to the bonding hypothesis. Overall, the evidence suggests that when dividend smoothing aligns with investor preferences, firms exhibiting higher degrees of smoothing tend to have higher firm valuations.

2.3. Linguistics and dividend payout

Recent studies have identified cross-linguistic differences as one of the factors explaining variations in corporate dividend policies across countries (Chen et al., 2017; Wang, 2019; He and Zhang, 2022; Nishikawa, Joo, and Parhizgar, 2023). Specifically, the grammatical distinction between using future versus present tense to describe future events, known respectively as strong-FTR and weak-FTR languages, affects how individuals perceive time and their psychological distance toward the future. These linguistic differences influence both investors' and firms' attitudes toward the future, which are subsequently reflected in their dividend preferences and payout decisions.

Chen et al. (2017) provides empirical evidence that firms operating in weak-FTR language countries hold higher levels of precautionary cash. Further analysis of these firms' additional cash sources reveals that they tend to invest less (i.e., lower capital expenditures), pay less interest, and issue more debt. Interestingly, despite their higher cash holdings, these firms distribute more dividends, suggesting that dividend payout decisions are not necessarily synchronized with cash-holding decisions and may be driven by other considerations.

Similarly, Wang (2019) finds that firms in weak-FTR language countries tend to pay higher dividends, as managers cater to shareholders' preference for holding more cash. This result primarily supports the dividend catering hypothesis and is consistent with Chen's (2017) findings. Moreover, Wang (2019) shows that the effect of language on dividend policy is weaker in countries with stronger shareholder and creditor protection mechanisms, suggesting that national governance structures and linguistic features serve as substitutes in shaping corporate dividend policies.

On the other hand, Nishikawa, Joo, and Parhizgar (2023) posit that the use of future tense (strong-FTR languages) reduces individuals' attention to future outcomes, leading firms in strong-FTR language environments to focus more on present events. In contrast,

firms using present-tense grammar to describe future events (weak-FTR languages) tend to pay greater attention to long-term activities, such as future cash flows. Consequently, managers in weak-FTR language firms are more concerned about future prospects and thus make dividend payout decisions more cautiously, choosing to retain more cash as precautionary savings rather than distributing it to shareholders. This implies that managers of strong-FTR language firms, who are less worried about the future and more focused on current cash flows, are inclined to pay higher dividends. From the shareholders' perspective, Nishikawa, Joo, and Parhizgar (2023) argue that investors speaking strong-FTR languages may perceive the future as psychologically distant and therefore prefer receiving higher dividends today rather than allowing firms to reinvest for the future, thus forming a consensus between the company and its shareholders. Therefore, it is expected that firms located in countries with strong FTR languages will pay higher dividends than firms with weak FTR languages, which also indicates the existence of a dividend catering motivation in strong FTR countries. Nishikawa's view that investors in strong FTR languages would want higher dividend payments currently, contrary to Chen et al. (2017) and Wang (2019), who argue that investors in weak FTR languages are more future-focused and therefore desire immediate dividends. Both support the dividend catering hypothesis, but Nishikawa, Joo, and Parhizgar (2023) instead posit that the catering effect is more prominent in strong-FTR language countries, whereas Wang (2019) finds it occurs primarily in weak-FTR contexts.

Moreover, He and Zhang (2022) argue that speakers of weak-FTR languages tend to perceive the future as temporally closer, such that they may psychologically compress a one-year (12-month) horizon into approximately ten months. Consequently, when discounting expected dividends, they apply a shorter time horizon, thereby overestimating the present value of future dividends. This cognitive bias leads to a higher perceived value of future dividends, making firms more inclined to allocate cash toward investment rather than immediate dividend payouts. Likewise, shareholders in weak-FTR language environments, expecting higher future returns, may prefer to receive dividends later. Therefore, He and Zhang (2022) predict and empirically find that firms in weak-FTR language countries pay lower dividends than those in strong-FTR language countries. Because corporate managers and shareholders share similar temporal preferences, this behavior is consistent with the dividend catering theory proposed by Baker and Wurgler (2004a, 2004b). In comparison with prior studies, their results suggest that when investors speaking weak-FTR languages hold optimistic views about the future, there is no conflict of interest between managers and shareholders. Additionally, the finding that weak-FTR firms distribute lower dividends aligns with Nishikawa, Joo, and Parhizgar (2023) but

contrasts with Chen et al. (2017), who argues that weak-FTR firms invest less, thereby reporting the opposite relationship between FTR strength and corporate investment behavior.

From the perspective of dividend catering, Baker and Wurgler (2004a, 2004b) argue that managers actively monitor the relative valuation of dividend-paying versus non-dividend-paying firms and adjust payout policy accordingly. Specifically, when investors place a premium on dividend payers, managers are more likely to initiate or maintain dividend payments; conversely, when the market favors nonpayers, managers tend to omit dividends. If grammatical heterogeneity shapes investors' preferences for dividends, then optimal dividend policy may depend not only on firms' internal conditions but also on the linguistic environment of their shareholder base. In this case, firms may adopt different "optimal" dividend-catering strategies across linguistic groups, and the same should be true for dividend smoothing decisions.

2.4. A linguistic hypothesis in dividend smoothing

Dividend smoothing is a type of dividend payout policy designed to prevent dividend reductions or omissions, thereby providing shareholders with stable and predictable dividends over time, which enhances their trust in the firm and reduces its future cost of capital. Since existing literature suggests that cross-linguistic differences help explain international variation in dividend payout policies, and language itself has a potential impact on people's preferences; however, no study has examined whether language influences the likelihood and intensity of dividend smoothing practices. This study fills this gap by investigating how linguistic heterogeneity affects firms' dividend smoothing and how investors in different language environments value dividend stability.

Specifically, following Chen et al. (2017) and Nishikawa, Joo, and Parhizgar (2023), firms in countries with weak-FTR language tend to be more cautious in their dividend decisions and prefer to retain cash as a buffer against uncertainty. Such prudence suggests that these firms are more likely to adopt stable and consistent dividend policies, reflecting a higher degree of dividend smoothing. Accordingly, we propose the following hypothesis:

Hypothesis 1a: *Ceteris paribus*, firms located in weak-FTR language countries exhibit a higher degree of dividend smoothing.

From another perspective, according to He and Zhang (2022), firms located in countries with weak-FTR language tend to allocate their funds primarily toward investment opportunities, leading them to adopt a residual dividend policy. Consequently, these firms are expected to exhibit a lower degree of dividend smoothing.

Based on the dividend catering theory, Wang (2019) argues that investors in weak-FTR language countries place greater emphasis on holding cash in hand to cope with potential risks. Therefore, they prefer firms to distribute higher dividends when profits are strong and lower dividends when profits decline, reflecting investors' desire to receive cash as soon as possible. To meet such preferences, firms are likely to adopt a less stable dividend policy, implying a lower level of dividend smoothing. Accordingly, we propose the following hypothesis:

Hypothesis 1b: *Ceteris paribus*, firms located in weak-FTR language countries exhibit a lower degree of dividend smoothing.

3. Research design

3.1. Data

We construct our sample using firms with available financial data from the Compustat Global and Compustat North America databases. Country-level variables are obtained from La Porta et al. (2000), Djankov et al. (2007, 2008), Hofstede (1980), and the World Bank. Following He and Zhang (2022), our sample period begins in 1997, when Compustat Global started providing more comprehensive data for non-U.S. firms, and spans 1997–2022, yielding 26 years of observations.¹

We exclude firms with missing values for the dependent or key independent variables. Consistent with Baker and Wurgler (2015), because dividend smoothing can become ambiguous when dividends are reported in a non-local currency, we retain only dividend-per-share (DPS) data reported in the local currency. Firms involved in mergers or acquisitions are also excluded.

Following Leary and Michaely (2011), we measure dividend smoothing by first removing each firm's observations prior to the first positive DPS and after the last positive DPS (Compustat data item 26). We retain firms with at least 10 consecutive years of non-missing data on DPS, earnings per share (EPS) (Compustat data item 58), and the share adjustment factor (data item 27, used for stock split adjustments). We further exclude countries with fewer than five remaining firms, resulting in the removal of Chile, Peru, and Russia.

The final sample comprises 160,593 firm-year observations across 42 countries. Consistent with Nishikawa, Joo, and Parhizgar (2023) and Chen et al. (2017), we classify

¹ The Compustat database has data available from 1988, but because the estimation of the speed of dividend smoothing requires 10 years of rolling data, the sample for regression analysis begins in 1997.

countries based on the strength of their Future Time Reference (FTR) in linguistic structure. Specifically, the sample includes 17 weak-FTR and 25 strong-FTR language countries, accounting for approximately 40% and 60% of the total sample, respectively.

3.2. Measurement of dividend smoothing

Following Leary and Michaely (2011), we measure the dividend smoothing using the speed of dividend adjustment (SOA) and estimate it within a rolling 10-year window. The SOA originates from Lintner's (1956) partial adjustment model, which can be estimated as $\hat{\gamma}$ in Equation (1):

$$\Delta D_{i,t} = D_{i,t} - D_{i,t-1} = \alpha + \gamma (D_{i,t}^* - D_{i,t-1}) + \varepsilon_{i,t} \quad (1)$$

where $D_{i,t}$ denotes the dividend per share (DPS) of firm i in year t , $\Delta D_{i,t}$ is the change in DPS relative to the prior year, and $D_{i,t}^* - D_{i,t-1}$ represents the expected change in dividends. The target dividend level $D_{i,t}^*$ is defined as $TP * E_{i,t}$, where TP is the target payout ratio and $E_{i,t}$ is earnings per share (EPS) in year t . Thus, Equation (1) can be rewritten as Equation (2):

$$\begin{aligned} \Delta D_{i,t} &= \alpha + \gamma (TP * E_{i,t} - D_{i,t-1}) + \varepsilon_{i,t} = \alpha + (-\gamma)D_{i,t-1} + (\gamma TP)E_{i,t} + \varepsilon_{i,t} \\ &= \alpha + \beta_1 D_{i,t-1} + \beta_2 E_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (2)$$

Both the target payout ratio (TP) and SOA (γ) are estimated from the regression. Following Lintner (1956), the SOA can be calculated as $\hat{\gamma} = -\beta_1$. To mitigate the influence of extreme values, SOA estimates are winsorized between 0 and 1, with qualitatively similar results. The dividend smoothing is then measured as $1 - \gamma$, where a higher SOA indicates lower smoothing.

However, Leary and Michaely (2011) demonstrate through simulation experiments that the above estimation of the SOA tends to be upward biased. As the true adjustment speed or the number of firm-level observations increases, the estimation bias tends to decline. Therefore, we adopt a two-step estimation approach to improve the accuracy and reliability of the SOA estimates. In the first stage, each firm's target payout ratio (TP_i) is calculated as the median payout ratio (dividends per share divided by earnings per share) over the full sample period. For robustness checks, we also use the median payout ratio over the prior five-year rolling window. Using this target, we compute the firm's dividend deviation (dev) in each year, as shown in Equation (3):

$$dev_{i,t} = TP_i * E_{i,t} - D_{i,t-1} \quad (3)$$

In the second stage, we estimate the SOA (denoted $\hat{\beta}$) using the following regression model within a 10-year rolling window, as expressed in Equation (4):

$$\Delta D_{i,t} = \alpha + \beta * dev_{i,t} + \varepsilon_{i,t} \quad (4)$$

This two-step approach provides a more reliable and unbiased estimate of the firm's speed of dividend adjustment (SOA_{10}).

3.3. Measurement of language

Following Nishikawa, Joo, and Parhizgar (2023) and Chen et al. (2017), we classify the sample countries into weak-FTR and strong-FTR language groups. We then construct a dummy variable, *Weak FTR Language_{i,t}*, which equals 1 if a firm's headquarters is located in a country where a weak-FTR language is the primary language, and 0 otherwise (i.e., for firms in strong-FTR language countries).

3.4. Control variables for dividend smoothing

Following Leary and Michaely (2011), we control for a set of firm-level characteristics that may affect dividend smoothing. *Firm size* is measured as the natural logarithm of total assets. Larger firms generally have easier access to capital markets and thus can sustain more stable dividend payments, suggesting a negative relationship with *SOA*. *Firm age* is defined as the number of years since the firm first appeared in the Compustat database and is expected to have a similar negative relation with *SOA*, as older firms tend to be more established and stable. *Asset tangibility*, measured as net property, plant, and equipment divided by total assets, reflects a firm's ability to use tangible assets as collateral to obtain financing; hence, it is also expected to be negatively associated with *SOA*. Earnings volatility ($std(EBIT)$) is calculated as the standard deviation of the ratio of EBIT to total assets over the past five years. Higher earnings volatility indicates greater risk and less stable dividends, implying a positive relationship with *SOA*. *Leverage* is defined as total short-term and long-term debt divided by total assets. Firms with higher leverage may have greater access to funds or may use debt to support dividends. However, creditors often restrict dividend payments to protect their claims, which leads to a negative expected relation between leverage and *SOA*. Finally, the *dividend payout ratio*, measured as dividends divided by earnings, captures payout policy aggressiveness. Firms with higher payout ratios face more difficulty maintaining dividend levels when earnings decline, suggesting a positive relation with *SOA*.

At the country level, following Javakhadze, Ferris, and Sen (2014), Chen et al. (2017),

and He and Zhang (2022), we include several macro and institutional variables. $\ln(GDP)$ is the natural logarithm of GDP per capita from the World Bank; higher GDP indicates stronger economic development and thus more stable dividend payments, implying a negative association with *SOA*. *GDP growth*, measured as the annual growth rate of per capita GDP, captures the pace of economic development. Countries with higher growth rates may experience more uncertainty, leading to a positive association with *SOA*. *Legal origin*, defined by La Porta et al. (2000), indicates whether a country follows French, German, or Scandinavian civil law traditions (coded as 1, otherwise 0). Civil-law countries tend to offer weaker shareholder protection relative to common-law countries, which may lead to less stable dividends (a positive relationship with *SOA*) or, alternatively, more stable dividends (a negative relationship with *SOA*) if smoothing serves as a substitute for weak investor protection. The *Legal Rights Index* (0–12, World Bank) measures creditor and debtor protection. The higher value of legal rights indicates stronger protection and more efficient lending and bankruptcy systems, implying a negative relationship with *SOA*. The *anti-self-dealing* index (0–1, Djankov et al., 2008) gauges protection against insider expropriation; higher values reflect better minority shareholder protection and thus a negative relation with *SOA*. The *Creditor Right Index* (0–4, Djankov et al., 2007) measures the degree of creditor protection during bankruptcy. A higher score indicates stronger legal protection for creditors, and the debtor is more likely to prioritize creditors' demands. Consequently, dividend payouts may be more stable and negatively correlated with *SOA*. On the other hand, when the law already provides sufficient protection for creditors, borrowing firms do not need to rely on dividend smoothing policies to gain the trust of creditors. Therefore, dividend payouts may be less stable and positively correlated with *SOA*.

Consistent with Chen et al. (2017) and He and Zhang (2022), we also incorporate national cultural variables. Religious composition from The World Factbook and follow La Porta et al. (1999) to define the value of Protestant, Christian Catholic, Buddhist, or Muslim as 1 if more than 50% of the residents of the company's country or region are Christian/Catholic/Buddhist/Muslim, otherwise it is 0. *Corruption*, from Transparency International, refers to perceived corruption, where higher values indicate lower corruption. *Trust*, defined by La Porta et al. (1997), reflects the general level of interpersonal trust in society. *Political inclination*, as coded from the IDB Political Institutions database, is categorized as follows: 1 for right-wing, 2 for centrist, and 3 for left-wing governments; right-wing regimes are typically more conservative and hierarchical, while left-wing regimes favor reform and equality.

Finally, following Javakhadze, Ferris, and Sen (2014), we include six national cultural

dimensions from Hofstede's culture dimensions: *power distance* (degree of social inequality), *individualism* (degree of social integration), *masculinity* (emphasis on achievement and authority), *uncertainty avoidance* (tolerance for ambiguity), *long-term orientation* (focus on future vs. past values), and *indulgence* (importance of leisure and gratification).

3.5. Empirical specification

To examine the relationship between language and dividend smoothing, the following regression equation is constructed:

$$SOA_{i,t} = a + b \text{ Weak FTR language}_i + \text{firm characteristics}_{i,t} + \text{market characteristics}_{i,t} + \text{fixed effects}_{i,t} + \varepsilon_{i,t} \quad (5)$$

where *SOA* is firm *i*'s speed of dividend adjustment in year *t*. The key explanatory variable is *Weak FTR Language*. A positive and statistically significant coefficient on *Weak FTR Language* indicates that firms in weak-FTR countries exhibit a higher SOA than those in strong-FTR countries, implying faster dividend adjustments and thus less dividend smoothing (and vice versa). We additionally include a comprehensive set of firm-level controls (firm characteristics) and country-level controls (market characteristics) to account for other determinants of dividend smoothing. All specifications also incorporate year and industry fixed effects to absorb common time trends and unobserved industry heterogeneity. The error term is denoted by ε .

4. Empirical results

4.1. Descriptive statistics and correlation analysis

Figure 1 illustrates the relationship between national linguistic structure and dividend smoothing, measured by the average speed of dividend adjustment (SOA) across countries. Countries are sorted in descending order of mean SOA. This figure is purely descriptive and does not control for industry-, firm-, or country-level heterogeneity. Dark bars represent countries and regions classified as weak-FTR languages, whereas light bars represent strong-FTR languages. The sample includes 17 weak-FTR and 25 strong-FTR language countries. As shown in Figure 1, the mean SOA values for both weak-FTR and strong-FTR countries range approximately from 0.2 to 0.8, suggesting that it is not possible to infer whether dividend adjustment is systematically faster in one language group than the other based solely on this univariate comparison.

[Insert Figure 1 around here]

Table 1 reports the sample distribution and country-level averages of SOA. The sample covers 1997–2022 (26 years) and consists of 160,593 firm-year observations from 42 countries. Panel A summarizes the distribution of firms across 17 weak-FTR language countries/regions, while Panel B presents the corresponding distribution for 25 strong-FTR language countries/regions. Table 1 shows that the mean (median) *SOA* in weak-FTR countries is 0.3843 (0.2874), compared with 0.3655 (0.2659) in strong-FTR countries. Thus, weak-FTR countries exhibit a slightly higher SOA, implying less dividend smoothing, although the difference is modest (0.0188). This descriptive evidence is more consistent with the argument that investors in weak-FTR language environments are more concerned about the future and therefore prefer to receive cash sooner. Managers may cater to such preferences by adjusting dividend payouts more frequently. Moreover, managers in weak-FTR countries may place greater emphasis on investment needs than on maintaining stable dividends, consistent with a residual dividend policy. Overall, these patterns provide preliminary support for Hypothesis 1b, which predicts that firms in weak-FTR language countries exhibit lower dividend smoothing, *ceteris paribus*. In terms of sample composition, the United States contributes 3,423 firms, representing the largest share among strong-FTR countries. Within the weak-FTR group, Japan accounts for 3,225 firms (44.54%), the largest representation in that subsample.

[Insert Table 1 around here]

Table 2 reports descriptive statistics for the dependent variable, the key explanatory variable, firm-level controls, and country-level controls (including governance variables). The dependent variable, Dividend smoothing, is proxied by the speed of dividend adjustment (*SOA₁₀*). As shown in Table 2, *SOA₁₀* has a mean of 0.3735, with the 1st and 99th percentiles equal to -0.0269 and 1.0360 , respectively. Following Lintner (1956) and Leary and Michaely (2011), SOA should lie between 0 and 1. Therefore, in the regression analyses, we winsorize SOA values below 0 to 0 and above 1 to 1. The main explanatory variable, *Weak-FTR language*, has a mean of 0.4277, indicating that 42.77% of the firm-year observations are from countries with weak-FTR language, while the majority belong to countries with strong-FTR.

[Insert Table 2 around here]

Table 3 presents the correlation matrix. The lower triangular panel reports Pearson correlations, while the upper triangular panel reports Spearman correlations. The results

of the correlation between the key variable Weak-FTR language and control variables show that, except for the correlation coefficients with German legal origins and the legal rights index, which were higher than 0.5, the absolute correlation coefficients between "weak FTR language" and all other control variables are below 0.3, suggesting that multicollinearity is unlikely to be a major concern.

Turning to the dependent variable, SOA_{10} is positively correlated with *Weak-FTR language* (0.03), implying that firms in countries with weak-FTR language exhibit, on average, a higher adjustment speed and thus less stable (less smoothed) dividend payouts. For firm characteristics, SOA_{10} is negatively associated with *Firm size* (−0.03), *Firm age* (−0.15), *Asset tangibility* (−0.02), and *Leverage* (−0.01), indicating that larger, older, more tangible-asset-intensive, and more levered firms tend to adjust dividends more slowly and thus exhibit more stable dividends. By contrast, SOA_{10} is positively correlated with *Std(EBIT)* and the *Dividend payout ratio*, suggesting that firms with more volatile earnings and higher payout rates adjust dividends more rapidly, resulting in less smooth dividend payments.

Regarding country characteristics, SOA_{10} is negatively correlated with $Ln(GDP)$ (−0.22), *German legal origin* (−0.13), the *Legal rights index* (−0.12), and the *Anti-self-dealing index* (−0.02). This pattern suggests that firms in more developed economies and in countries with stronger investor protection and anti-expropriation institutions tend to have more stable dividend policies. In contrast, SOA_{10} is positively correlated with *GDP growth*, *French legal origin*, and *Scandinavian legal origin* (0.12, 0.11, and 0.07, respectively), indicating less stable dividend payouts in faster-growing economies and in these legal-origin environments. Interestingly, while French, German, and Scandinavian origins all belong to the civil-law tradition, the dividend adjustment speed is lower in German-origin countries but higher in French- and Scandinavian-origin countries. One possible interpretation is that in some environments firms may use stable dividend payments as a substitute mechanism to compensate for weaker legal investor protection.

[Insert Table 3 around here]

4.2. Univariate analysis

Table 4 reports univariate mean-difference tests by FTR language strength. We split the sample into strong-FTR and weak-FTR language groups and compare the mean values of the dependent variable and control variables using two-sample t-tests. Importantly, these comparisons are descriptive and do not control for firm-, industry-, or country-level heterogeneity. With the exception of asset tangibility, all variables differ significantly

across the two groups at the 1% level. Consistent with Table 1, the mean SOA_{10} equals 0.365 in strong-FTR countries and 0.384 in weak-FTR countries; the difference is statistically significant ($t = -11.03$, $p < 0.01$), indicating that firms in weak-FTR countries exhibit a higher dividend adjustment speed and therefore less dividend smoothing, which is consistent with Hypothesis 1b.

In terms of firm characteristics, firms headquartered in weak-FTR countries are, on average, larger and older, while exhibiting lower earnings volatility, lower leverage, and lower dividend payout ratios than firms in strong-FTR countries. At the country level, weak-FTR firms are headquartered in countries with higher GDP per capita and lower GDP growth. While several of these characteristics would typically predict more stable dividend policies, the weak-FTR group still displays a higher SOA_{10} . Taken together, the univariate patterns are suggestive that dividend adjustments may be more frequent in weak-FTR environments, although this interpretation requires multivariate tests controlling for confounding factors.

[Insert Table 4 around here]

4.3. Regression analysis

Table 5 reports regressions of dividend smoothing (SOA_{10}) on *Weak-FTR language*, with industry and year fixed effects included in all specifications. Model (1) includes only *Weak-FTR language*. The coefficient on *Weak-FTR language* is positive and statistically significant (0.0145, $p < 0.01$), indicating that firms in weak-FTR countries adjust dividends more rapidly and thus smooth dividends less than firms in strong-FTR countries.

Because firm characteristics differ systematically between weak- and strong-FTR environments and may jointly affect payout behavior, Model (2) adds firm-level controls. The coefficient on *Weak-FTR language* remains positive and significant (0.0102, $p < 0.01$), suggesting that the baseline association is not driven by observable firm heterogeneity. Consistent with the literature, SOA_{10} is negatively associated with firm size, firm age, asset tangibility, and leverage, implying that larger, older, more tangible-asset-intensive, and more levered firms adjust dividends more slowly and thus maintain more stable dividend policies. In contrast, SOA_{10} is positively related to earnings volatility and the dividend payout ratio, indicating that firms with more volatile earnings and higher payout rates tend to have less stable payouts.

Language is inherently a country-level attribute; therefore, the relation between FTR and dividend smoothing may be confounded by national economic and institutional environments. Models (3)–(5) incrementally add country-level controls for economic

development, legal origin, legal rights, and investor/creditor protection, respectively, while retaining all controls and fixed effects in Model (6).

Model (3) adds macroeconomic controls. The coefficient on *Weak-FTR language* remains positive and significant (0.0487, $p < 0.01$). $\ln(GDP)$ loads negatively, indicating more stable dividends in more developed economies, whereas *GDP growth* loads positively, suggesting greater dividend instability in faster-growing economies.

Model (4) adds legal origin indicators and the legal rights index. The coefficient on *Weak-FTR language* remains positive and significant (0.365, $p < 0.01$). SOA_{10} is positively associated with French and Scandinavian legal origins, indicating less stable dividend policies in those environments. The *Legal rights index* is negatively related to SOA_{10} , implying that stronger collateral and bankruptcy enforcement are associated with more stable dividends.

Model (5) controls for investor/creditor protection, with *Weak-FTR language* remaining positive and significant (0.0100, $p < 0.01$); stronger anti-self-dealing protection and creditor rights are associated with greater dividend smoothing (lower SOA_{10}).

Model (6) includes the full set of controls from Models (1)–(5). The coefficient on *Weak-FTR language* remains positive and statistically significant (0.0721, $p < 0.01$), and the model achieves the highest explanatory power ($R^2 = 0.6182$). Overall, the evidence indicates that the relation between weak-FTR language environments and lower dividend smoothing is robust to extensive firm- and country-level controls, consistent with Hypothesis 1b: *ceteris paribus*, firms located in weak-FTR language countries exhibit lower dividend smoothing.

[Insert Table 5 around here]

4.4. Robustness checks

4.4.1. Controlling for national culture

Because language is an important component of national culture, it is possible that the estimated effect of *Weak-FTR language* merely captures other cultural attributes correlated with linguistic structure. To assess whether language has independent explanatory power beyond broader cultural factors, Table 6 examines the effect of linguistic structure on dividend smoothing, controlling for several representative country-level cultural factors. All specifications retain the full set of firm- and country-level controls in Table 5, Model (6), and sequentially add country-level cultural proxies.

Motivated by Stulz and Williamson (2003), Model (1) additionally includes four religion indicators: *Protestant*, *Catholic*, *Buddhist*, and *Muslim*. The coefficient on *Weak-FTR language* remains positive and significant (0.0225, $p < 0.01$), suggesting that the language effect is not subsumed by religious composition.

According to La Porta et al. (1997), a country's legal system and level of corruption can influence investors' trust in corporate governance, which in turn affects their expectations regarding corporate dividend policy. Guiso et al. (2004) note that the level of social trust can influence the financial behavior of individuals and enterprises. In a society with high trust, enterprises are more likely to obtain external resources and implement flexible dividend policies. Motivated by La Porta et al. (1997) and Guiso et al. (2004), Model (2) adds the *Corruption* index and a country-level *Trust* measure. The coefficient on *Weak-FTR language* remains positive and significant (0.0440, $p < 0.01$), indicating robustness to cross-country variation in governance quality and social trust.

Following Javakhadze, Ferris, and Sen (2014), Models (3)–(8) separately introduce Hofstede's cultural dimensions: power distance, individualism, masculinity, uncertainty avoidance, long-term orientation, and indulgence. Across all specifications, the coefficient on *Weak-FTR language* remains positive and significant at the 1% level, suggesting that linguistic structure has incremental explanatory power beyond standard cultural traits. Model (9), which includes all Hofstede cultural measures simultaneously, continues to yield a positive and significant coefficient on *Weak-FTR language* (0.1313, $p < 0.01$), reinforcing the robustness of the language effect.

Prior work links political orientation to corporate policy choices. For example, Hutton et al. (2014) demonstrate that managers with a conservative political ideology tend to adopt more conservative financial policies. Accordingly, following Chen et al. (2017), Model (10) includes political inclination (coded as 1 = right-wing, 2 = centrist, 3 = left-wing). The coefficient on *Weak-FTR language* remains positive and significant (0.0287, $p < 0.01$). The estimated coefficient on *Weak-FTR language* remains positive and significant (0.0287, $p < 0.01$), indicating that the language–dividend smoothing relation is robust to differences in the political environment.

Overall, the results in Table 6 indicate that the association between weak-FTR language environments and higher *SOA*₁₀ (less dividend smoothing) persists after controlling for multiple cultural and institutional factors, providing further support for Hypothesis 1b.

[Insert Table 6 around here]

4.4.2. Alternative measures of dividend smoothing

Table 7 presents robustness tests using alternative measures of dividend smoothing. In the baseline analysis, the dependent variable SOA_{10} is the speed of dividend adjustment estimated using the two-step procedure of Leary and Michaely (2011), where each firm's target payout ratio is defined as the median payout ratio over the full sample period, and SOA is estimated from rolling 10-year regressions. To assess robustness, we replace SOA_{10} with four alternative measures of the speed of dividend adjustment. The first three measures follow the same two-step approach in Leary and Michaely (2011) but vary the rolling window length and/or the construction of the target payout ratio. The fourth measure follows the original Lintner (1956) partial adjustment model. All regression specifications mirror Table 5 Models (6).

Model (1) presents the baseline regression result. In Model (2), SOA computes the speed of dividend adjustment using rolling 5-year regressions (SOA_5). The coefficient on *Weak-FTR language* remains positive and significant (0.0599, $p < 0.01$). In Model (3), the target payout ratio is defined as the median payout ratio over the prior 5-year rolling period, while SOA is still estimated using rolling 10-year regressions ($SOA_{5,10}$). The estimated coefficient on *Weak-FTR language* remains positive and significant (0.0551, $p < 0.01$). Model (4) applies the same rolling 5-year target payout ratio as Model (3), but estimates of SOA using rolling 5-year regressions ($SOA_{5,5}$). The coefficient on *Weak-FTR language* remains positive and significant (0.0792, $p < 0.01$). Model (5) estimates the speed of dividend adjustment using the original Lintner (1956) model with rolling 10-year regressions (SOA_{L10}). Again, *Weak-FTR language* loads positively and significantly (0.0802, $p < 0.01$).

Overall, across all alternative SOA constructions, *Weak-FTR language* is consistently associated with a higher speed of dividend adjustment (higher SOA) and thus lower dividend smoothing. These results confirm that the main conclusion is robust to alternative measures of dividend smoothing, supporting the interpretation that linguistic structure has a stable and economically meaningful effect on corporate dividend adjustment behavior.

[Insert Table 7 around here]

4.4.3. Alternative measures of linguistic structure

Following Chen (2013), we replace *Weak-FTR language* with two continuous proxies capturing the strength of grammatical future-time reference. All control variables and model specifications follow those outlined in Model (6) of Table 5. Table 8 reports

the results.

Model (1) uses *Verb ratio* as the key explanatory variable. This measure captures the frequency with which the future tense is used in verbs and is defined as the percentage of grammatically future-marked verbs relative to all future-referring verbs (ranging from 0 to 100). Higher values indicate stronger future tense marking and thus a stronger FTR language. Consistent with our prediction, *Verb ratio* loads negatively and significantly on SOA_{10} (-0.0011 , $p < 0.01$), implying that firms in stronger-FTR language environments adjust dividends more slowly and thus exhibit more dividend smoothing—consistent with the baseline finding that weak-FTR firms adjust dividends more frequently.

Model (2) uses *Sentence ratio*, defined as the percentage of future-referring sentences that contain explicit future-time reference structures (0–100). This measure differs from the *Verb ratio* because sentences with multiple verbs often mark only the first verb as future tense, leading to discrepancies between verb-based and sentence-based measures. *Sentence ratio* is also expected to be negatively related to SOA . The results confirm this prediction: the coefficient is negative and significant (-0.0009 , $p < 0.01$), indicating greater dividend smoothing in stronger-FTR language environments.

Overall, the results in Table 8 show that the main conclusion is robust to alternative language proxies. Regardless of whether FTR strength is measured using verb-based or sentence-based ratios, stronger grammatical future marking is associated with lower SOA_{10} , implying more dividend smoothing. Equivalently, firms in weak-FTR countries exhibit less dividend smoothing, consistent with the baseline evidence.

[Insert Table 8 around here]

4.4.4. Alternative estimation methods

This section evaluates robustness using four alternative estimation approaches. All models include the same set of regressors as Table 5, Model (6). Table 9 reports the results. Model (1) reports OLS estimates with standard errors clustered at the country level, accounting for within-country error dependence induced by shared institutions and cultural environments. The coefficient on *Weak-FTR language* remains positive (0.0721) and is statistically significant at the 10% level, suggesting that the baseline result is not driven by understated standard errors.

Model (2) applies a Tobit regression to accommodate the bounded nature of SOA_{10} (0–1). The coefficient on *Weak-FTR language* remains positive and highly significant (0.0844, $p < 0.01$), with a larger magnitude than in the OLS, indicating that the language

effect persists under a censoring-consistent specification.

Model (3) conducts a country-mean regression, where firm-level variables are aggregated to the country level prior to estimation, mitigating concerns that the results are dominated by large countries with disproportionate firm coverage. The coefficient on *Weak-FTR language* remains positive and significant (0.0731, $p < 0.01$).

Model (4) adds continent fixed effects to absorb regional heterogeneity (e.g., geography, historical development, colonial legacy). The coefficient on *Weak-FTR language* remains positive and significant (0.0648, $p < 0.01$), indicating that the baseline relation is unlikely to be driven by broad regional differences.

Taken together, these results corroborate our baseline inference that firms in weak-FTR language countries exhibit higher speeds of dividend adjustment (i.e., less dividend smoothing), and the estimated language effect is robust to alternative estimation methods and error structures.

[Insert Table 9 around here]

4.4.5. Alternative sample testing

This section performs robustness by re-estimating the baseline specification using alternative samples to mitigate concerns that the results are driven by sample composition. All models in Table 10 include the same set of controls as Model (6) in Table 5.

Model (1) excludes Japanese companies, which account for the largest share of the sample (39,972 firm-year observations) and may disproportionately influence the estimates. The coefficient on *Weak-FTR language* remains positive and significant (0.1322, $p < 0.01$), indicating that the baseline language effect persists even after removing the largest weak-FTR country.

Model (2) further addresses concentration by excluding the most represented country in each language group, Japan (weak-FTR; 58.20% of weak-FTR observations) and the United States (strong-FTR; 37,903 firm-year observations, 41.24% of strong-FTR observations). The coefficient on *Weak-FTR language* remains positive and significant (0.1315, $p < 0.01$) and becomes larger in magnitude, suggesting that the main results are not driven by a small number of highly represented countries.

The financial and regulated industries typically place particular emphasis on dividend payout policies, and investors also pay more attention to dividend payouts when investing in these industries. Therefore, including the financial and regulated industries

in the original analysis would be appropriate. However, dividend payout in these industries is often subject to regulatory intervention, which may affect the endogenous relationship between explanatory variables and dependent variables. Therefore, Model (3) excludes firms in financial and regulated industries for testing to ensure the robustness of the results. The coefficient on *Weak-FTR language* remains positive and significant (0.0695, $p < 0.01$), confirming that the language effect on dividend smoothing is robust outside financial sectors.

Taken together, these results further corroborate our baseline inference that firms in weak-FTR language countries exhibit less dividend smoothing, and that the estimated language effect is not driven by sample concentration or industry-specific regulation.

[Insert Table 10 around here]

4.5. Extended analysis

4.5.1. The influence of corporate governance

Regular dividend payments play an important role in mitigating agency conflicts between managers and shareholders by reducing the amount of free cash flow available for potential misuse. Accordingly, firms often commit to regular dividend payments to cater to dividend clienteles that value agency-cost reduction and payout discipline (e.g., Easterbrook, 1984; Allen et al., 2000; John, Knyazeva, and Knyazeva, 2011, 2015; Golubov, Lasfer, and Vitkova, 2020). Because dividend policy is closely linked to the quality of corporate governance, which influences whether managers adopt shareholder-aligned decisions, we further examine whether governance mechanisms moderate the relation between linguistic structure and dividend smoothing. Table 11 reports regression results for dividend smoothing after accounting for board reforms and shareholder protection, with all specifications including the full set of controls in Model (6) of Table 5.

To test whether the language effect varies with governance reforms, Model (1) adds a *Post Reform* indicator (based on Bae et al., 2021) and its interaction with *Weak-FTR language*. The coefficient on *Post Reform* is significantly negative (-0.0526 , $p < 0.01$), suggesting that dividend adjustment speeds decline (i.e., dividend smoothing increases) after board reforms. Importantly, *Weak-FTR language* remains positive and significant (0.0338, $p < 0.01$), and the interaction term *Post Reform* $\times$ *Weak-FTR language* is also positive and significant (0.0372, $p < 0.01$), indicating that the weak-FTR effect becomes stronger in the post-reform period. These results reveal that firms in countries with weak FTR languages, even if the reforms help improve overall stability and allow for more

consistent dividend payouts, may prioritize shareholder interests and cater to investors' preference for immediate cash flow, leading to more frequent dividend adjustments in countries with weak FTR cultures.

Models (2)–(3) split the sample by the median of the anti–self-dealing index into high versus low shareholder protection subsamples. The coefficient on *Weak-FTR language* is positive and significant in both groups, but is substantially larger under high shareholder protection (0.1786, $p < 0.01$) than under low protection (0.0455, $p < 0.01$). This pattern suggests that firms in weak-FTR language environments adjust dividends more frequently regardless of the institutional setting, and that this effect is amplified when shareholder protection is stronger, consistent with a stronger dividend-catering channel.

Model (4) introduces a High shareholder rights indicator, defined as Anti–self-dealing above the median, and its interaction with Weak-FTR language. High shareholder rights loads positively (0.2348, $p < 0.01$), implying higher dividend adjustment speeds in stronger shareholder-protection regimes. The interaction term High shareholder rights $\times$ Weak-FTR language is also positive and significant (0.0869, $p < 0.01$), indicating that the weak-FTR effect is markedly stronger when shareholder rights are high. Overall, these results suggest that in stronger governance environments, language-related preferences may be more directly reflected in corporate payout adjustments, strengthening the link between linguistic structure and dividend smoothing.

[Insert Table 11 around here]

4.5.2. The influence of the financial crisis

Thus, risk perception has a stronger impact on people in FTR countries. Therefore, this study further tested the impact of financial crises to examine the moderating effect of financial crises on the relationship between language and dividend smoothing.

Chen et al. (2017) argues that firms in weak-FTR language environments perceive risks as more imminent and therefore adopt more precautionary financial policies (e.g., higher cash holdings). Hence, people in countries with weak-FTR languages react more strongly to perceived risks. If corporate dividend smoothing is driven by catering motives, firms located in weak-FTR countries should further reduce dividend smoothing after the financial crisis. Thus, we further examine how financial crises influence the relation between linguistic structure and dividend smoothing. A financial crisis can adversely affect earnings stability, liquidity, external financing conditions, and stockholders' preferences, potentially inducing firms to revise their payout policies, particularly

dividend smoothing. Table 12 reports regression results around the 2007–2008 global financial crisis, with all specifications including the full set of controls in Model (6) of Table 5.

To mitigate contamination from the crisis years themselves, we define the pre-crisis period as 1997–2006 and the post-crisis period as 2009–2018 (each a 10-year window). Models (1) and (2) estimate the baseline regression separately for the pre- and post-crisis subsamples. The coefficient on *Weak-FTR language* is positive and significant in both periods (0.0417 and 0.0643, respectively; both $p < 0.01$), indicating that weak-FTR firms continue to adjust dividends more frequently (i.e., exhibit less smoothing) than strong-FTR firms both before and after the crisis. The larger coefficient in the post-crisis period suggests that the crisis may amplify the language-related differences in dividend smoothing.

Model (3) introduces a *Post Crisis* indicator and its interaction with *Weak-FTR language*. *Post Crisis* is significantly positive (0.7002, $p < 0.01$), consistent with less dividend smoothing after the crisis, as firms adjust payouts more closely to realized earnings and retain cash amid heightened uncertainty. While the main effect of *Weak-FTR language* is positive but insignificant (0.0076), the interaction term *Post Crisis* $\times$ *Weak-FTR language* is positive and significant (0.0766, $p < 0.01$), indicating that firms located in weak-FTR countries reduce dividend smoothing more strongly after the crisis. Taken together, the evidence suggests that linguistic environments may play a more pronounced role in shaping firms' dividend adjustment behavior after the 2008 financial crisis.

[Insert Table 12 around here]

5. Conclusion

This study examines whether linguistic heterogeneity shapes corporate dividend smoothing behavior. Using a global panel of firms from 42 countries from 1997 to 2022, we employ Future Time Reference (FTR), the grammatical marking of future time, as a language-based cultural attribute to investigate how linguistic structure affects corporate dividend smoothing and how investors speaking different languages may differ in their preferences for dividend stability. In the empirical analysis, we control for a comprehensive set of determinants of dividend smoothing, including firm characteristics, corporate governance, economic development, and legal institutions, to enhance identification and robustness.

Guided by prior literature, we posit that investors in weak-FTR language

environments perceive the future as more salient and may prefer receiving cash sooner, while firms and shareholders may also be more inclined to allocate resources toward investment, consistent with a residual payout orientation, thereby adjusting dividends more frequently. Consistent with these arguments, we find that firms located in weak-FTR language countries exhibit higher dividend adjustment speeds and thus lower dividend smoothing than firms in strong-FTR countries, providing evidence consistent with dividend catering. This positive association between weak-FTR language and the speeds of dividend adjustment remains robust after controlling for multiple cultural proxies, adopting alternative measures of dividend smoothing, using alternative measures of FTR languages, employing different estimation methods, and re-estimating the models in alternative samples. Moreover, additional analyses show that the language effect is more pronounced in environments characterized by stronger governance mechanisms and after financial crisis periods, suggesting that institutional context and external shocks can amplify language-related differences in payout adjustment behavior.

Overall, our results support the view that language, as a fundamental component of national culture, is associated with systematic variation in corporate financial decision-making. By linking FTR-based linguistic structure to dividend smoothing, particularly across heterogeneous institutional settings and under macroeconomic stress, this study extends the emerging literature on language and corporate policies. The findings offer a new perspective on cross-country differences in dividend behavior from both corporate decision-making and investor preference standpoints, and provide implications for managers and investors operating in multilingual and cross-cultural financial environments.

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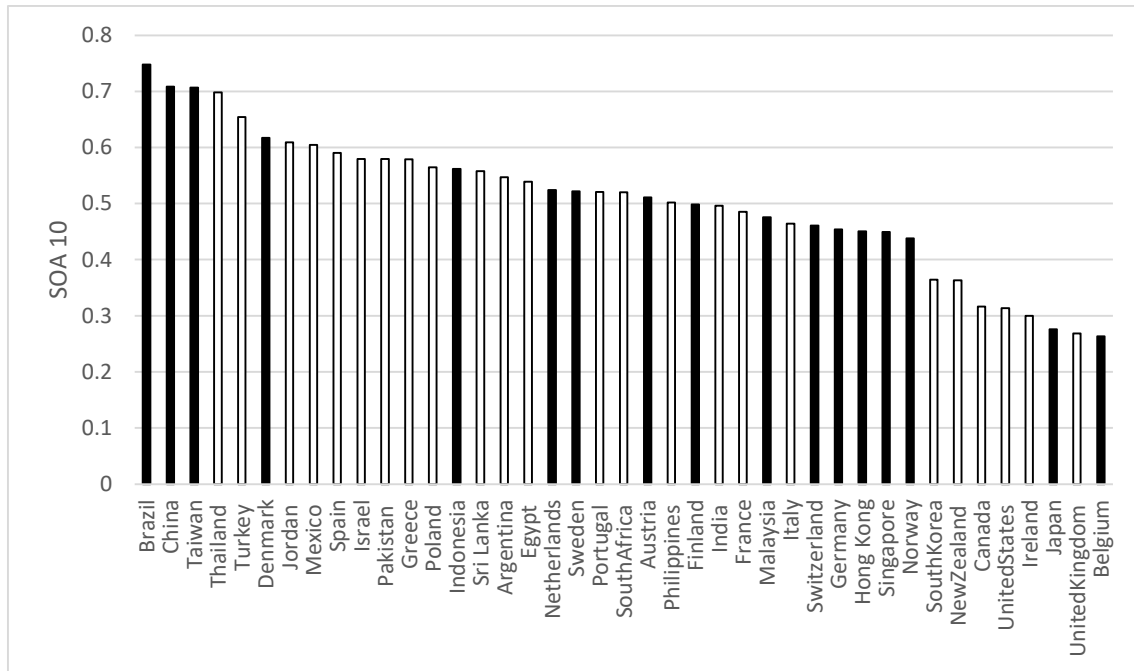


Fig. 1. Languages and corporate dividend smoothing

The figure shows the average dividend smoothing among firms in different countries. Dividend smoothing (SOA10) is measured by the speed of dividend adjustments and calculated using a rolling 10-year regression. Darker-color bars represent countries with weaker FTR languages, while lighter-color bars represent countries with stronger FTR languages. The classification of weak and strong FTR language countries is based on Chen (2013) and Nishikawa et al. (2023).

Table 1 Sample Distribution

This table presents the sample distribution and the average SOA10 for each country. The sample spans 26 years, from 1997 to 2022, comprising 160,593 firm-year observations from 42 countries, including 17 countries with weak FTR language and 25 countries with strong FTR language. Speed of dividend adjustments (SOA10) is calculated using a two-stage estimation method by Leary and Michaely (2011) with a rolling 10-year regression to measure dividend smoothing. Panel A presents the company sample distribution statistics for weak FTR language countries, and Panel B presents the company sample distribution statistics for strong FTR language countries. The classification of weak and strong FTR language countries is based on Chen (2013) and Nishikawa et al. (2023).

Panel A. Weak-FTR language countries and regions

Country	N(firms)	% of firms	N(firm-years)	% of obs.	SOA10
Austria	34	0.47%	327	0.48%	0.5113
Belgium	72	0.99%	602	0.88%	0.2636
Brazil	197	2.72%	1668	2.43%	0.7480
China	1302	17.98%	4809	7.00%	0.7087
Denmark	59	0.81%	465	0.68%	0.6174
Finland	86	1.19%	902	1.31%	0.4984
Germany	235	3.25%	2180	3.17%	0.4539
Hong Kong	183	2.53%	2552	3.72%	0.4505
Indonesia	9	0.12%	59	0.09%	0.5622
Japan	3225	44.54%	39972	58.20%	0.2761
Malaysia	542	7.49%	5833	8.49%	0.4759
Netherlands	73	1.01%	726	1.06%	0.5243
Norway	86	1.19%	703	1.02%	0.4383
Singapore	338	4.67%	3297	4.80%	0.4497
Sweden	216	2.98%	2160	3.14%	0.5220
Switzerland	150	2.07%	1326	1.93%	0.4612
Taiwan	434	5.99%	1103	1.61%	0.7068
Mean					0.3843
Median					0.2874
Std. dev.					0.3371

Panel B Strong-FTR language countries and regions

Country	N(firms)	% of firms	N(firm-years)	% of obs.	SOA10
Argentina	19	0.21%	172	0.19%	0.5467
Australia	480	5.29%	4617	5.02%	0.4193
Canada	591	6.52%	6011	6.54%	0.3164
Egypt	6	0.07%	24	0.03%	0.5392
France	126	1.39%	1031	1.12%	0.4854
Greece	28	0.31%	216	0.24%	0.5791
India	1355	14.94%	13502	14.69%	0.4958
Ireland	45	0.50%	535	0.58%	0.2997
Israel	133	1.47%	856	0.93%	0.5794
Italy	68	0.75%	486	0.53%	0.4641
Jordan	18	0.20%	143	0.16%	0.6092
Mexico	25	0.28%	223	0.24%	0.6047
New Zealand	46	0.51%	375	0.41%	0.3634
Pakistan	149	1.64%	1409	1.53%	0.5793
Philippines	50	0.55%	451	0.49%	0.5021
Poland	9	0.10%	57	0.06%	0.5644
Portugal	16	0.18%	137	0.15%	0.5207
South Africa	122	1.35%	995	1.08%	0.5203
South Korea	747	8.24%	6391	6.95%	0.3642
Spain	48	0.53%	438	0.48%	0.5900
Sri Lanka	110	1.21%	927	1.01%	0.5575
Thailand	183	2.02%	931	1.01%	0.6983
Turkey	12	0.13%	51	0.06%	0.6541
United Kingdom	1259	13.88%	14028	15.26%	0.2682
United States	3423	37.75%	37903	41.24%	0.3133
Mean					0.3655
Median					0.2659
Std. dev.					0.3383

Table 2 Summary Statistics

This table presents descriptive statistics covering 26 years from 1997 to 2022, with 160,593 firm-year observations from 42 countries. Dividend smoothing is the speed of dividend adjustments (*SOA10*), calculated using a two-stage estimation method by Leary and Michaely (2011) with a rolling 10-year regression. *Weak-FTR language* is a dummy variable, set to 1 if the firm is located in a country with weak-FTR language, and 0 otherwise. *Firm size* is the natural logarithm of total assets; *Firm age* is the number of years since the company first appeared in the Compustat database; *Asset tangibility* is net property, plant, and equipment divided by total assets; *std(EBIT)* is the standard deviation of the EBIT to total assets ratio over the past five years; *Leverage* is the sum of short-term and long-term liabilities divided by total assets; and *Dividend payout ratio* is dividends divided by earnings. *Ln(GDP)* is the natural logarithm of a country's GDP divided by its population; *GDP growth* is the annual growth rate of GDP per capita; *French legal origin* / *German legal origin* / *Scandinavian legal origin* are dummy variables, which equal 1 if the firm is from a country/region with French/German/Scandinavian legal origin, otherwise 0; *Legal rights index* measures the strength of protection for creditors and debtors, with values ranging from 0 (weakest) to 12 (strongest); *Anti-self-dealing index* measures the extent to which a country's legal framework protects minority shareholders by restricting or preventing self-dealing transactions, related-party transactions through which controlling shareholders or managers may expropriate wealth at the expense of outside shareholders, generally ranging from 0 (weakest) to 1 (strongest); *Creditor right* measures the degree of protection creditors receive in the event of debtor bankruptcy, typically ranging from 0 (weakest) to 4 (strongest).

Variable	Mean	S.D.	P1	P10	Q1	Median	Q3	P90	P99
Dividend smoothing									
<i>SOA10</i>	0.3735	0.3379	-0.0269	0.0015	0.0799	0.2760	0.6318	0.9406	1.0360
Languages									
<i>Weak-FTR language</i>	0.4277	0.4947	0	0	0	0	1	1	1
Firm-specific variables									
<i>Firm size</i>	8.9171	2.8000	2.8623	5.3063	6.8743	8.8825	10.7785	12.5724	15.9485
<i>Firm age</i>	20.6744	8.3099	7.0000	10.0000	14.0000	20.0000	26.0000	32.0000	44.0000
<i>Asset tangibility</i>	0.2529	0.2268	0.0000	0.0038	0.0410	0.2118	0.3922	0.5914	0.8684
<i>std(EBIT)</i>	0.0287	0.0322	0.0009	0.0043	0.0095	0.0188	0.0351	0.0617	0.2000
<i>Leverage</i>	0.5246	0.2395	0.0156	0.1964	0.3497	0.5264	0.6952	0.8822	0.9715
<i>Dividend payout ratio</i>	0.4042	0.7343	-2.1931	0.0000	0.1354	0.3010	0.5405	0.9232	4.6952
Country-specific and governance variables									
<i>Ln(GDP)</i>	10.1916	1.0744	7.0000	8.1149	10.2847	10.5904	10.7908	10.9718	11.3363
<i>GDP growth</i>	1.8079	2.9171	-6.6735	-1.2721	0.7745	1.8115	3.0321	5.3092	8.8186
<i>French legal origin</i>	0.0455	0.2083	0	0	0	0	0	0	1
<i>German legal origin</i>	0.3198	0.4664	0	0	0	0	1	1	1
<i>Scandinavian legal origin</i>	0.0263	0.1601	0	0	0	0	0	0	1
<i>Legal rights index</i>	7.1744	2.7693	2	5	5	7	11	11	11
<i>Anti-self-dealing index</i>	0.6250	0.1853	0.2200	0.4600	0.5000	0.6400	0.6500	0.9500	1.0000
<i>Creditor right</i>	2.0254	0.9716	1	1	1	2	3	4	4

Table 3 Correlation Matrix

This table displays the correlation matrix for each variable in baseline regression. The lower left half shows the Pearson correlation analysis, and the upper right half shows the Spearman correlation analysis. The analysis was performed on the full sample, and the variable definitions are the same as those in Table 2. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) SOA10	1.00	0.03 ***	-0.03 ***	-0.15 ***	-0.02 *	0.01 ***	-0.01 ***	0.03 ***	-0.22 ***	0.12 ***	0.11 ***	-0.13 ***	0.07 ***	-0.12 ***	-0.02 ***	0.00 ***
(2) Weak-FTR language	0.03 ***	1.00	0.33 ***	0.05 ***	0.00	-0.14 ***	-0.14 ***	-0.02	0.14 ***	-0.10 ***	0.08 ***	0.62 ***	0.19 ***	-0.60 ***	-0.25 ***	0.13 ***
(3) Firm size	-0.03 ***	0.33 ***	1.00	0.27 ***	0.06 ***	-0.28 ***	0.22 ***	-0.07 ***	-0.05 ***	-0.02 ***	-0.05 ***	0.57 ***	-0.03 ***	-0.42 ***	-0.42 ***	-0.03 ***
(4) Firm age	-0.15 ***	0.05 ***	0.27 ***	1.00	0.09 ***	-0.09 ***	0.01 ***	-0.03 ***	0.26 ***	-0.12 ***	-0.06 ***	0.18 ***	-0.04 ***	0.10 ***	-0.16 ***	-0.20 ***
(5) Asset tangibility	-0.02 ***	0.00	0.06 ***	0.09 ***	1.00	-0.01 ***	-0.06 ***	0.00 ***	-0.10 ***	0.05 ***	-0.04 ***	0.06 ***	-0.05 ***	-0.04 ***	-0.06 ***	-0.04 ***
(6) std(EBIT)	0.01 ***	-0.14 ***	-0.28 ***	-0.09 ***	-0.01 ***	1.00	-0.28 ***	-0.04 ***	-0.08 ***	0.02 ***	-0.02 ***	-0.16 ***	0.02 ***	0.05 ***	0.15 ***	0.14 ***
(7) Leverage	-0.01 ***	-0.14 ***	0.22 ***	0.01 **	-0.06 ***	-0.28 ***	1.00	-0.02 ***	0.09 ***	-0.02 ***	0.04 ***	-0.09 ***	0.01 ***	0.17 ***	-0.10 ***	-0.24 ***
(8) Dividend payout ratio	0.03 ***	-0.02 ***	-0.07 ***	-0.03 ***	0.00	-0.04 ***	-0.02 ***	1.00	0.06 ***	-0.02 ***	0.02 ***	-0.05 ***	0.02 ***	0.04 ***	0.04 ***	0.00 ***
(9) Ln(GDP)	-0.22 ***	0.14 ***	-0.05 ***	0.26 ***	-0.10 ***	-0.08 ***	0.09 ***	0.06 ***	1.00	-0.36 ***	0.00 ***	0.24 ***	0.11 ***	0.29 ***	0.03 ***	-0.06 ***
(10) GDP growth	0.12 ***	-0.10 ***	-0.02 ***	-0.12 ***	0.05 ***	0.02 ***	-0.02 ***	-0.02 ***	-0.36 ***	1.00	-0.07 ***	-0.17 ***	-0.05 ***	-0.04 ***	0.10 ***	0.02 ***
(11) French legal origin	0.11 ***	0.08 ***	-0.05 ***	-0.06 ***	-0.04 ***	-0.02 ***	0.04 ***	0.02 ***	0.00	-0.07 ***	1.00	-0.06 ***	-0.04 ***	-0.27 ***	-0.36 ***	-0.17 ***
(12) German legal origin	-0.13 ***	0.62 ***	0.57 ***	0.18 ***	0.06 ***	-0.16 ***	-0.09 ***	-0.05 ***	0.24 ***	-0.17 ***	-0.06 ***	1.00	-0.11 ***	-0.54 ***	-0.54 ***	0.09 ***
(13) Scandinavian legal origin	0.07 ***	0.19 ***	-0.03 ***	-0.04 ***	-0.05 ***	0.02 ***	0.01 ***	0.02 ***	0.11 ***	-0.05 ***	-0.04 ***	-0.11 ***	1.00	-0.04 ***	-0.21 ***	-0.11 ***
(14) Legal rights index	-0.12 ***	-0.60 ***	-0.42 ***	0.10 ***	-0.04 ***	0.05 ***	0.17 ***	0.04 ***	0.29 ***	-0.04 ***	-0.27 ***	-0.54 ***	-0.04 ***	1.00	0.37 ***	-0.30 ***
(15) Anti-self-dealing index	-0.02 ***	-0.25 ***	-0.42 ***	-0.16 ***	-0.06 ***	0.15 ***	-0.10 ***	0.04 ***	0.03 ***	0.10 ***	-0.36 ***	-0.54 ***	-0.21 ***	0.37 ***	1.00	0.52 ***
(16) Creditor right	0.00	0.13 ***	-0.03 ***	-0.20 ***	-0.04 ***	0.14 ***	-0.24 ***	0.00	-0.06 ***	0.02 ***	-0.17 ***	0.09 ***	-0.11 ***	-0.30 ***	0.52 ***	1.00

Table 4 Difference Tests

This table shows the results of univariate difference tests based on strong and weak FTR language groups, with the variable definitions being the same as those in Table 2. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Variable	Strong-FTR language		Weak-FTR language		Difference tests	
	N	Mean	N	Mean	Mean	t-value
SOA10	91909	0.365	68684	0.384	-0.0188	-11.03 ***
Firm size	91909	8.106	68684	10.002	-1.8953	-144.40 ***
Firm age	91909	20.334	68684	21.131	-0.7971	-19.72 ***
Asset tangibility	91909	0.253	68684	0.253	-0.0003	-0.291
std(EBIT)	91909	0.033	68684	0.023	0.0094	62.051 ***
Leverage	91909	0.554	68684	0.485	0.069	59.018 ***
Dividend payout ratio	91909	0.414	68684	0.390	0.024	6.609 ***
Ln(GDP)	91909	10.058	68684	10.371	-0.3126	-63.527 ***
GDP growth	91909	2.050	68684	1.484	0.5654	38.325 ***
French legal origin	91909	0.032	68684	0.064	-0.032	-29.163 ***
German legal origin	91909	0.070	68684	0.654	-0.5837	-291.65 ***
Scandinavian legal origin	91909	0.000	68684	0.062	-0.0616	-67.138 ***
Legal rights index	91909	8.603	68684	5.262	3.3411	323.78 ***
Anti-self-dealing index	91909	0.666	68684	0.570	0.0953	101.13 ***
Creditor right	91909	1.914	68684	2.174	-0.2597	-57.84 ***

Table 5 Regression analyses of languages on dividend smoothing

This table presents the regression analysis results for the effect of language on dividend smoothing. The dependent variable is the speed of dividend adjustment (SOA_{10}), estimated using the two-stage estimation method of Leary and Michaely (2011), with the median payout ratio during the sample period, and a rolling 10-year regression to estimate SOA. *Weak FTR language* is a dummy variable, set to 1 if the firm is located in a country with weak FTR language, and 0 otherwise. The classification of weak and strong FTR language countries is based on Chen (2013) and Nishikawa et al. (2023). The definitions of control variables are the same as those in Table 2. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively, while the values in parentheses are t-values.

Parameter	(1)	(2)	(3)	(4)	(5)	(6)
Weak-FTR language	0.0145 *** (7.62)	0.0102 *** (5.04)	0.0487 *** (23.68)	0.0365 *** (13.63)	0.0100 *** (4.90)	0.0721 *** (23.85)
Firm size		-0.0030 *** (-7.98)	-0.0076 *** (-20.34)	0.0065 *** (13.90)	-0.0034 *** (-8.19)	0.0027 *** (5.61)
Firm age		-0.0089 *** (-74.09)	-0.0057 *** (-45.11)	-0.0061 *** (-47.14)	-0.0091 *** (-72.62)	-0.0052 *** (-38.86)
Asset tangibility		-0.0351 *** (-3.11)	-0.0351 *** (-6.10)	0.0205 *** (3.57)	-0.0194 *** (-3.33)	0.0096 * (1.68)
std(EBIT)		0.0790 *** (2.58)	-0.0689 ** (-2.27)	-0.0103 (-0.34)	0.0871 *** (2.84)	-0.0707 ** (-2.33)
Leverage		-0.0449 *** (-9.56)	-0.0102 ** (-2.18)	-0.0687 *** (-14.72)	-0.0493 *** (-10.46)	-0.0579 *** (-12.35)
Dividend payout ratio		0.0098 *** (8.84)	0.0134 *** (12.21)	0.0093 *** (8.49)	0.0100 *** (9.00)	0.0113 *** (10.43)
Ln(GDP)			-0.0537 *** (-50.64)			-0.0190 *** (-13.55)
GDP growth			0.0083 *** (17.33)			0.0086 *** (17.95)
French legal origin				0.0507 *** (10.53)		0.0163 ** (2.42)
German legal origin				-0.2025 (-65.55)		-0.2175 *** (-36.84)
Scandinavian legal origin				0.0349 *** (5.96)		-0.0108 (-1.32)
Legal rights index				-0.0218 *** (-42.73)		-0.0138 *** (-22.21)
Anti-self-dealing index					-0.0283 *** (-4.01)	-0.2188 *** (-16.58)
Creditor right					-0.0089 *** (-7.02)	0.0116 *** (7.13)
Industry Fixed Effect	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES	YES	YES
# of observations	160576	160576	160576	160576	160576	160576
Adjusted R ²	0.5946	0.5946	0.6072	0.6137	0.5951	0.6182

Table 6 Controlling for national culture

This table presents the regression analysis results of language on dividend smoothing after controlling for the variable of national culture. The dependent variable is the speed of dividend adjustment (SOA_{10}), estimated using the two-stage estimation method of Leary and Michael (2011), with the median payout ratio during the sample period, and a rolling 10-year regression to estimate SOA. Weak FTR language is a dummy variable, set to 1 if the firm is located in a country with weak FTR language, and 0 otherwise. The classification of weak and strong FTR language countries is based on Chen (2013) and Nishikawa et al. (2023). The definitions of control variables are the same as those in Table 2. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively, while the values in parentheses are t-values.

Parameter	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Weak-FTR language	0.0225 *** (6.22)	0.0440 *** (9.74)	0.0709 *** (20.47)	0.0572 *** (18.55)	0.1045 *** (32.98)	0.0577 *** (18.40)	0.0865 *** (27.88)	0.0715 *** (23.32)	0.1313 *** (27.72)	0.0287 *** (5.53)
Firm size	-0.0015 *** (-2.94)	0.0017 *** (3.07)	0.0026 *** (5.26)	0.0013 *** (2.69)	0.0010 ** (2.21)	0.0034 *** (7.04)	0.0056 *** (11.41)	0.0023 *** (4.64)	0.0027 *** (5.21)	0.0047 *** (7.47)
Firm age	-0.0044 *** (-32.46)	-0.0038 *** (-26.84)	-0.0052 *** (-38.56)	-0.0050 *** (-37.46)	-0.0047 *** (-35.04)	-0.0052 *** (-38.55)	-0.0053 *** (-39.68)	-0.0051 *** (-37.50)	-0.0047 *** (-34.58)	-0.0041 *** (-23.20)
Asset tangibility	0.0048 (0.84)	-0.0078 (-1.24)	0.0095 * (-1.66)	0.0116 ** (2.03)	0.0042 (0.73)	0.0107 * (1.87)	0.0109 * (1.91)	0.0072 (-1.25)	0.0057 (1.00)	0.0039 (0.51)
std(EBIT)	-0.0833 *** (-2.76)	-0.0960 *** (-2.91)	-0.0707 ** (-2.34)	-0.0990 *** (-3.28)	-0.0911 *** (-3.02)	-0.0652 ** (-2.15)	-0.0739 ** (-2.44)	-0.0575 * (-1.89)	-0.0999 *** (-3.29)	-0.1002 *** (-2.73)
Leverage	-0.0327 *** (-6.87)	-0.0740 *** (-14.52)	-0.0573 *** (-12.06)	-0.0453 *** (-9.63)	-0.0391 *** (-8.34)	-0.0619 *** (-13.19)	-0.0664 *** (-14.14)	-0.0601 *** (-12.65)	-0.0515 *** (-10.76)	-0.0818 *** (-12.78)
Dividend payout ratio	0.0109 *** (10.18)	0.0079 *** (6.89)	0.0113 *** (-10.44)	0.0112 *** (10.38)	0.0109 *** (10.19)	0.0116 *** (10.70)	0.0108 *** (10.06)	0.0113 *** (-10.44)	0.0104 *** (9.63)	0.0101 *** (7.43)
Ln(GDP)	-0.0189 *** (-12.62)	0.0054 ** (2.23)	-0.0180 *** (-9.34)	0.0225 *** (9.84)	-0.0230 *** (-16.38)	-0.0188 *** (-13.43)	-0.0118 *** (-8.22)	-0.0188 *** (-12.00)	-0.0268 *** (-9.59)	-0.0054 *** (-2.68)
GDP growth	0.0059 *** (11.85)	0.0026 *** (4.11)	0.0085 *** (17.78)	0.0091 *** (19.06)	0.0061 *** (12.69)	0.0066 *** (13.28)	0.0093 *** (19.38)	0.0083 *** (16.82)	0.0057 *** (11.05)	0.0129 *** (19.01)
French legal origin	0.0607 *** (8.35)	0.0076 (0.74)	0.0151 ** (2.15)	0.0189 *** (2.79)	-0.0076 (-1.13)	0.0398 *** (5.76)	-0.0108 (-1.59)	0.0239 *** (3.26)	0.0326 *** (3.98)	-0.0212 * (-1.91)
German legal origin	-0.1868 *** (-30.59)	-0.2044 *** (-25.62)	-0.2178 *** (-36.69)	-0.2251 *** (-38.14)	-0.1384 *** (-22.06)	-0.1523 *** (-20.50)	-0.1645 *** (-24.98)	-0.2147 *** (-34.75)	-0.1109 *** (-13.50)	-0.2615 *** (-26.11)
Scandinavian legal origin	0.2260 *** (19.56)	-0.0068 (-0.68)	-0.0098 (-1.19)	0.0330 *** (3.94)	-0.1422 *** (-15.68)	-0.0171 ** (-2.10)	-0.0179 ** (-2.20)	-0.0007 (-0.08)	-0.1891 *** (-16.43)	-0.0262 ** (-2.41)
Legal rights index	-0.0220 *** (-30.03)	-0.0176 *** (-17.13)	-0.0138 *** (-22.07)	-0.0146 *** (-23.45)	-0.0127 *** (-20.48)	-0.0159 *** (-25.16)	-0.0160 *** (-25.46)	-0.0129 *** (-19.26)	-0.0137 *** (-19.57)	-0.0089 *** (-9.09)
Anti-self-dealing index	-0.0587 *** (-3.97)	-0.3816 *** (-22.16)	-0.2221 *** (-15.75)	-0.3245 *** (-23.42)	-0.1367 *** (-10.23)	-0.2198 *** (-16.68)	-0.1669 *** (-12.48)	-0.2126 *** (-15.32)	-0.1375 *** (-7.51)	-0.5259 *** (-27.10)
Creditor right	0.0280 *** (16.29)	0.0230 *** (10.96)	0.0119 *** (7.11)	0.0304 *** (16.77)	-0.0035 ** (-2.08)	0.0044 *** (2.58)	0.0091 *** (5.63)	0.0103 *** (6.25)	-0.0029 (-1.33)	0.0404 *** (19.46)
Protestant	-0.1696 *** (-29.11)									
Catholic	-0.0250 *** (-3.81)									
Buddhist	0.0583 *** (6.53)									
Muslim	-0.0385 *** (-7.81)									
Corruption		-0.0384 *** (-22.78)								
Trust		0.2783 *** (12.43)								
Power distance			0.0001 (-0.71)						-0.0027 *** (-17.34)	
Individualism				-0.0030 *** (-23.03)					-0.0024 *** (-13.26)	
Masculinity					-0.0027 *** (-35.60)				-0.0033 *** (-29.91)	
Uncertainty avoidance						-0.0015 *** (-15.00)			-0.0008 *** (-6.49)	
Long-term orientation							-0.0018 *** (-19.24)		0.0006 *** (4.05)	
Indulgence								-0.0004 *** (-3.54)	0.0004 *** (2.71)	
political inclination										0.0082 *** (6.35)
Industry Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
# of observations	160576	137783	160576	160576	160576	160576	160576	158793	158793	92109
Adjusted R ²	0.6209	0.6073	0.6182	0.6197	0.6215	0.6189	0.6193	0.6164	0.6214	0.6182

Table 7 Alternative measures of dividend smoothing

This table presents the regression analysis results for different measures of dividend smoothing. In Model (1), the dependent variable is the speed of dividend adjustment (SOA_{10}), estimated using the two-stage estimation method of Leary and Michaely (2011), with the median payout ratio during the sample period, and a rolling 10-year regression to estimate SOA. In Model (2), the dependent variable is the speed of dividend adjustment (SOA_5), estimated using the two-stage estimation method of Leary and Michaely (2011), with the median payout ratio during the sample period, and a rolling 5-year regression to estimate SOA. In Model (3), the dependent variable is the speed of dividend adjustment ($SOA_{5,10}$), estimated using the two-stage estimation method of Leary and Michaely (2011), with the median payout ratio over the past five years, and a rolling 10-year regression to estimate SOA. Model (4) the dependent variable is the speed of dividend adjustment ($SOA_{5,5}$), estimated using the two-stage estimation method of Leary and Michaely (2011), with the median payout ratio over the past five years, and a rolling 5-year regression to estimate SOA. Model (5) uses the Lintner (1956) model to estimate by regression over a rolling 10-year period. *Weak FTR language* is a dummy variable, set to 1 if the firm is located in a country with weak FTR language, and 0 otherwise. The classification of weak and strong FTR language countries is based on Chen (2013) and Nishikawa et al. (2023). The definitions of control variables are the same as those in Table 2. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively, while the values in parentheses are t-values.

Parameter	dependent variable				
	SOA ₁₀	SOA ₅	SOA _{5,10}	SOA _{5,5}	SOA _{L10}
	(1)	(2)	(3)	(4)	(5)
Weak-FTR language	0.0721 *** (23.85)	0.0599 *** (20.63)	0.0551 *** (20.93)	0.0792 *** (25.68)	0.0802 *** (15.93)
Firm size	0.0027 *** (5.61)	-0.0016 *** (-3.27)	-0.0014 *** (-3.34)	0.0034 *** (6.80)	-0.0083 *** (-11.00)
Firm age	-0.0052 *** (-38.86)	-0.0061 *** (-47.89)	-0.0058 *** (-50.65)	-0.0047 *** (-34.70)	-0.0046 *** (-21.26)
Asset tangibility	0.0096 * (1.68)	-0.0001 (-0.01)	0.0001 (0.03)	-0.0041 (-0.68)	0.0168 * (1.81)
std(EBIT)	-0.0707 ** (-2.33)	0.1104 *** (3.69)	0.0954 *** (3.53)	0.1315 *** (4.08)	-0.1343 *** (-2.64)
Leverage	-0.0579 *** (-12.35)	-0.0621 *** (-12.92)	-0.0585 *** (-13.43)	-0.1169 *** (-23.46)	-0.0180 *** (-2.34)
Dividend payout ratio	0.0113 *** (10.43)	0.0137 *** (12.32)	0.0119 *** (11.94)	0.0108 *** (10.03)	0.0079 *** (4.46)
Ln(GDP)	-0.0190 *** (-13.55)	-0.0176 *** (-13.29)	-0.0178 *** (-14.87)	-0.0253 *** (-17.89)	-0.0569 *** (-24.55)
GDP growth	0.0086 *** (17.95)	0.0127 *** (28.12)	0.0116 *** (28.69)	0.0107 *** (22.28)	0.0060 *** (7.22)
French legal origin	0.0163 ** (2.42)	0.0247 *** (4.02)	0.0287 *** (5.16)	0.0342 *** (5.08)	0.0124 (1.11)
German legal origin	-0.2175 *** (-36.84)	-0.1905 *** (-34.80)	-0.1716 *** (-34.62)	-0.1852 *** (-31.45)	-0.0519 *** (-5.46)
Scandinavian legal origin	-0.0108 (-1.32)	-0.0010 (-0.13)	0.0050 (0.72)	0.0058 (0.70)	0.0599 *** (4.47)
Legal rights index	-0.0138 *** (-22.21)	-0.0198 *** (-33.63)	-0.0180 *** (-33.94)	-0.0166 *** (-26.41)	-0.0010 (-0.95)
Anti-self-dealing index	-0.2188 *** (-16.58)	-0.1331 *** (-10.71)	-0.1241 *** (-10.98)	-0.1391 *** (-10.44)	-0.2137 *** (-10.27)
Creditor right	0.0116 *** (7.13)	0.0060 *** (3.88)	0.0065 *** (4.60)	0.0103 *** (6.22)	0.0099 *** (3.85)
Industry Fixed Effect	YES	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES	YES
# of observations	160576	245756	245756	194926	97185
Adjusted R ²	0.6182	0.5652	0.6005	0.5626	0.6853

Table 8 Alternative measures of linguistic structure

This table presents the regression analysis results of different language measures on the impact of dividend smoothing. the dependent variable is the speed of dividend adjustment (SOA10), estimated using the two-stage estimation method of Leary and Michael (2011), with the median payout ratio during the sample period, and a rolling 10-year regression to estimate SOA. In Model (1), the verb ratio is used to measure linguistic structure. It calculates the number of verbs grammatically marked as future tense, divided by the total number of future reference verbs. The number ranges from 0 to 100%, with a higher number indicating a stronger future tense. In Model (2), the sentence ratio is used to measure linguistic structure. It measures the percentage of sentences about future events that contain grammatically future markers. The number ranges from 0 to 100%, with a higher number indicating a stronger future tense. A sentence with multiple verbs often only marks the first verb as future tense. This grammatical difference leads to the difference between the verb and sentence ratios. The definitions of control variables are the same as those in Table 2. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively, while the values in parentheses are t-values.

Parameter	Verb ratio	Sentence ratio
	(1)	(2)
Verb ratio	-0.0011 *** (-28.68)	-0.0009 *** (-26.78)
Firm size	0.0028 *** (5.81)	0.0030 *** (6.24)
Firm age	-0.0052 *** (-38.27)	-0.0052 *** (-38.13)
Asset tangibility	0.0060 (1.01)	0.0050 (0.85)
std(EBIT)	-0.1060 *** (-3.44)	-0.1049 *** (-3.40)
Leverage	-0.0629 *** (-13.12)	-0.0646 *** (-13.47)
Dividend payout ratio	0.0100 *** (9.13)	0.0099 *** (9.06)
Ln(GDP)	-0.0176 *** (-11.08)	-0.0160 *** (-10.10)
GDP growth	0.0097 *** (19.08)	0.0101 *** (19.70)
French legal origin	0.0269 *** (3.58)	0.0264 *** (3.51)
German legal origin	-0.2394 *** (-37.63)	-0.2337 *** (-36.78)
Scandinavian legal origin	-0.0275 *** (-3.27)	-0.0216 ** (-2.57)
Legal rights index	-0.0127 *** (-19.17)	-0.0128 *** (-19.31)
Anti-self-dealing index	-0.2813 *** (-19.06)	-0.2795 *** (-18.83)
Creditor right	0.0210 *** (12.43)	0.0199 *** (11.78)
Industry Fixed Effect	YES	YES
Year Fixed Effect	YES	YES
# of observations	152224	152224
Adjusted R ²	0.6140	0.6137

Table 9 Alternative estimating approaches

This table presents the regression analysis results of dividend smoothing on language using different estimation methods. The dependent variable is the speed of dividend adjustment (SOA10), estimated using the two-stage estimation method of Leary and Michaely (2011), with the median payout ratio during the sample period, and a rolling 10-year regression to estimate SOA. Weak FTR language is a dummy variable, set to 1 if the firm is located in a country with weak FTR language, and 0 otherwise. The classification of weak and strong FTR language countries is based on Chen (2013) and Nishikawa et al. (2023). The definitions of control variables are the same as those in Table 2. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively, while the values in parentheses are t-values.

Parameter	(1)	(2)	(3)	(4)
	Country cluster	Tobit Reg.	Country mean Reg.	Continent FE
Weak-FTR language	0.0721 *	0.0844 ***	0.0731 ***	0.0648 ***
	(1.85)	(25.76)	(19.64)	(18.62)
Firm size	0.0027	0.0031 ***	-0.0013	0.0009 *
	(0.61)	(5.98)	(-1.63)	(-1.71)
Firm age	-0.0052 ***	-0.0059 ***	-0.0062 ***	-0.0049 ***
	(-3.71)	(-40.06)	(-23.86)	(-35.30)
Asset tangibility	0.0096	0.0099	0.0517 ***	0.0057
	(0.40)	(1.58)	(5.41)	(0.99)
std(EBIT)	-0.0707	-0.1019 ***	0.2823 ***	-0.1077 ***
	(-0.47)	(-2.98)	(4.90)	(-3.57)
Leverage	-0.0579	-0.0648 ***	-0.0674 ***	-0.0434 ***
	(-1.65)	(-12.38)	(-7.97)	(-9.06)
Dividend payout ratio	0.0113 ***	0.0132 ***	0.0111 ***	0.0100 ***
	(3.79)	(10.59)	(5.19)	(9.27)
Ln(GDP)	-0.0190	-0.0199 ***	-0.0246 ***	-0.0292 ***
	(-1.41)	(-13.38)	(-12.96)	(-12.76)
GDP growth	0.0086 ***	0.0095 ***	0.0070 ***	0.0091 ***
	(2.71)	(18.14)	(11.52)	(18.98)
French legal origin	0.0163	0.0128 *	0.0446 ***	0.0670 ***
	(0.25)	(1.88)	(5.84)	(7.90)
German legal origin	-0.2175 ***	-0.2473 ***	-0.1626 ***	-0.1711 ***
	(-3.35)	(-40.24)	(-21.90)	(-23.18)
Scandinavian legal origin	-0.0108	-0.0204 ***	0.0169 *	0.0998 ***
	(-0.14)	(-2.38)	(1.82)	(9.27)
Legal rights index	-0.0138 *	-0.0158 ***	-0.0085 ***	-0.0220 ***
	(-1.97)	(-24.01)	(-10.66)	(-27.54)
Anti-self-dealing index	-0.2188	-0.2544 ***	-0.1776 ***	-0.1317 ***
	(-1.59)	(-18.74)	(-12.21)	(-8.64)
Creditor right	0.0116	0.0141 ***	0.0127 ***	0.0222 ***
	(0.66)	(8.27)	(6.57)	(9.40)
Industry Fixed Effect	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES
Continent Fixed Effect	NO	NO	NO	YES
# of observations	160577	160577	54930	160576
Adjusted R ²	0.6182	0.1412	0.7187	0.6202

Table 10 Different subsample tests

This table presents the regression analysis results of the impact of language on dividend smoothing under different samples. The dependent variable is the speed of dividend adjustment (SOA10), estimated using the two-stage estimation method of Leary and Michael (2011), with the median payout ratio during the sample period, and a rolling 10-year regression to estimate SOA. Weak FTR language is a dummy variable, set to 1 if the firm is located in a country with weak FTR language, and 0 otherwise. The classification of weak and strong FTR language countries is based on Chen (2013) and Nishikawa et al. (2023). The definitions of control variables are the same as those in Table 2. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively, while the values in parentheses are t-values.

Parameter	(1) Excluding US	(2) Excluding largest weak-FTR and strong-FTR countries	(3) Excluding financial regulation industry
Weak-FTR language	0.1322 *** (40.99)	0.1315 *** (39.83)	0.0695 *** (19.96)
Firm size	0.0039 *** (7.51)	0.0063 *** (10.31)	0.0030 *** (5.14)
Firm age	-0.0043 *** (-28.96)	-0.0054 *** (-24.22)	-0.0062 *** (-37.64)
Asset tangibility	0.0353 *** (5.29)	0.0463 *** (6.05)	0.0303 *** (4.81)
std(EBIT)	-0.0331 (-1.02)	-0.1200 *** (-3.20)	0.4246 *** (11.00)
Leverage	-0.0398 *** (-7.13)	0.0085 (1.30)	-0.1044 *** (-20.26)
Dividend payout ratio	0.0136 *** (10.83)	0.0139 *** (8.67)	0.0069 *** (5.41)
Ln(GDP)	-0.0242 *** (-16.57)	-0.0160 *** (-9.97)	-0.0105 *** (-6.59)
GDP growth	0.0036 *** (6.99)	0.0029 *** (5.44)	0.0075 *** (13.52)
French legal origin	-0.0256 *** (-3.84)	-0.0353 *** (-5.08)	0.0198 ** (2.45)
German legal origin	-0.0922 *** (-13.81)	-0.1207 *** (-17.46)	-0.2414 *** (-34.94)
Scandinavian legal origin	-0.0529 *** (-6.50)	-0.0929 *** (-10.60)	-0.0149 (-1.60)
Legal rights index	-0.0158 *** (-25.56)	-0.0128 *** (-19.28)	-0.0144 *** (-20.04)
Anti-self-dealing index	-0.1456 *** (-11.02)	-0.1569 *** (-11.73)	-0.2171 *** (-14.12)
Creditor right	-0.0098 *** (-5.74)	-0.0157 *** (-8.03)	0.0131 *** (6.73)
Industry Fixed Effect	YES	YES	YES
Year Fixed Effect	YES	YES	YES
# of observations	120609	82705	117697
Adjusted R ²	0.6453	0.6838	0.6301

Table 11 The effect of corporate governance

Column (1) shows the regression analysis results of dividend smoothing on language after the implementation of board reform in the country where the sample firm is located. The reform year is referenced from Bae et al. (2021). *Post Reform* is a dummy variable, with a value of 1 after the reform and 0 otherwise. Columns (2) and (3) are divided into high/low shareholder rights protection levels according to the median of *Anti-self-dealing*. Column (4) shows the regression analysis results of dividend smoothing on language under high shareholder rights protection in the country where the sample firm is located. *High shareholder rights* is a dummy variable with a value of 1 for samples with an index higher than the median and 0 otherwise. The dependent variable is the speed of dividend adjustment (SOA10), estimated using the two-stage estimation method of Leary and Michael (2011), with the median payout ratio during the sample period, and a rolling 10-year regression to estimate SOA. Weak FTR language is a dummy variable, set to 1 if the firm is located in a country with weak FTR language, and 0 otherwise. The classification of weak and strong FTR language countries is based on Chen (2013) and Nishikawa et al. (2023). The definitions of control variables are the same as those in Table 2. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively, while the values in parentheses are t-values.

Parameter	(1) Board Reform	(2) Countries with high shareholder rights	(3) Countries with low shareholder rights	(4) Full Sample
Weak-FTR language	0.0338 *** (3.82)	0.1786 *** (30.14)	0.0455 *** (9.22)	0.0173 *** (4.06)
Post Reform*Weak-FTR language	0.0372 *** (4.25)			
Post Reform	-0.0526 *** (-8.42)			
High shareholder rights*Weak-FTR language				0.0869 *** (13.79)
High shareholder rights				0.2348 *** (29.90)
Firm size	0.0026 *** (5.49)	-0.0018 ** (-2.54)	0.0069 *** (9.53)	0.0021 *** (4.23)
Firm age	-0.0052 *** (-38.96)	-0.0034 *** (-20.12)	-0.0084 *** (-32.60)	-0.0051 *** (-37.73)
Asset tangibility	0.0103 * (1.80)	0.0078 (0.93)	0.0169 ** (2.06)	0.0057 (1.01)
std(EBIT)	-0.0761 *** (-2.51)	-0.1364 *** (-3.69)	-0.0373 (-0.70)	-0.0775 ** (-2.58)
Leverage	-0.0569 *** (-12.12)	-0.0664 *** (-9.28)	-0.0169 *** (-2.58)	-0.0458 *** (-9.73)
Dividend payout ratio	0.0113 *** (10.50)	0.0118 *** (8.72)	0.0076 *** (4.61)	0.0107 *** (10.03)
Ln(GDP)	-0.0195 *** (-13.94)	-0.0444 *** (-14.02)	-0.1197 *** (-29.19)	-0.0689 *** (-31.35)
GDP growth	0.0085 *** (17.75)	0.0040 *** (5.83)	0.0064 *** (8.37)	0.0061 *** (12.42)
French legal origin	0.0198 *** (2.94)	-0.2839 *** (-6.84)	0.2486 *** (22.75)	0.1247 *** (16.62)
German legal origin	-0.2146 *** (-36.17)	0.0000 ***	0.1215 *** (10.26)	-0.0128 (-1.63)
Scandinavian legal origin	-0.0050 (-0.61)		0.3870 *** (25.40)	0.2044 *** (20.77)
Legal rights index	-0.0142 *** (-22.74)	-0.0156 *** (-15.53)	-0.0181 *** (-18.11)	-0.0109 *** (-17.55)
Anti-self-dealing index	-0.2086 *** (-15.72)	-0.9307 *** (-27.25)	-0.3727 *** (-16.73)	-0.5030 *** (-34.86)
Creditor right	0.0130 *** (7.92)	0.0660 *** (18.72)	0.0369 *** (11.31)	0.0281 *** (16.80)
Industry Fixed Effect	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES
# of observations	160576	82791	77784	160576
Adjusted R ²	0.6184	0.6153	0.6545	0.6231

Table 12 The effect of financial crisis

This table presents the regression analysis results of dividend smoothing on language pre- and post- the financial crisis. The period during the financial crisis is 2007-2008. Excluding the impact of the current financial crisis, the period pre-financial crisis is set as 1997-2006 (10 years), and the period post-financial crisis is 2009-2018 (10 years). *Post crisis* is a dummy variable, which takes a value of 1 after the financial crisis and 0 otherwise. The dependent variable is the speed of dividend adjustment (SOA10), estimated using the two-stage estimation method of Leary and Michael (2011), with the median payout ratio during the sample period, and a rolling 10-year regression to estimate SOA. Weak FTR language is a dummy variable, set to 1 if the firm is located in a country with weak FTR language, and 0 otherwise. The classification of weak and strong FTR language countries is based on Chen (2013) and Nishikawa et al. (2023). The definitions of control variables are the same as those in Table 2. *, **, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively, while the values in parentheses are t-values.

Parameter	(1)	(2)	(3)
	Before crisis	After crisis	Full sample
Weak-FTR language	0.0417 *** (4.85)	0.0643 *** (14.09)	0.0076 (1.37)
Post crisis*Weak-FTR language			0.0766 *** (14.86)
Postcrisis			0.7002 *** (22.45)
Firm size	0.0093 *** (7.72)	0.0042 *** (5.97)	0.0062 *** (10.37)
Firm age	-0.0038 *** (-9.59)	-0.0062 *** (-30.03)	-0.0056 *** (-31.28)
Asset tangibility	-0.0223 * (-1.66)	0.0328 *** (3.91)	0.0084 (1.19)
std(EBIT)	-0.1945 *** (-2.83)	0.1415 *** (3.16)	-0.1386 *** (-3.81)
Leverage	-0.1532 *** (-13.81)	-0.0491 *** (-7.29)	-0.0814 *** (-14.17)
Dividend payout ratio	0.0126 *** (5.24)	0.0062 *** (4.04)	0.0101 *** (7.70)
Ln(GDP)	-0.0309 *** (-7.24)	-0.0200 *** (-8.79)	-0.0240 *** (-12.23)
GDP growth	0.0099 *** (7.43)	0.0067 *** (8.02)	0.0077 *** (10.94)
French legal origin	0.0852 *** (3.33)	0.0678 *** (6.98)	0.0658 *** (7.30)
German legal origin	-0.2401 *** (-11.86)	-0.2216 *** (-25.09)	-0.2330 *** (-29.22)
Scandinavian legal origin	-0.0628 ** (-2.25)	0.0315 *** (2.75)	0.0102 (0.97)
Legal rights index	0.0083 *** (3.80)	-0.0036 *** (-3.58)	0.0002 (0.22)
Anti-self-dealing index	-0.3982 *** (-9.56)	-0.3020 *** (-16.29)	-0.3431 *** (-20.54)
Creditor right	0.0448 *** (9.62)	0.0326 *** (13.67)	0.0344 *** (16.44)
Industry Fixed Effect	YES	YES	YES
Year Fixed Effect	YES	YES	YES
# of observations	30900	73185	104086
Adjusted R ²	0.6092	0.6275	0.6118