The Effect of Time Orientation in Languages on the Recognition of Goodwill Impairment Losses

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Synopsis:

The research problem

In this study, we investigate the relationship between the future-time reference (FTR) in languages and goodwill impairment.

Motivation

Previous studies on goodwill have focused mainly on firms' economic and reporting incentives in single country settings using economic theories. Therefore, there have been recent calls for more research on goodwill accounting across countries (d'Arcy and Tarca, 2018), and greater use of behavioural theories in goodwill accounting studies (Amel-Zadeh *et al.*, 2021). In response, we apply the linguistic relativity hypothesis to a new and highly significant area of future-oriented behavior (impairment decision) to explain cross-country variations in goodwill impairment reporting.

The test hypotheses

We hypothesize: Firms in countries that use weak FTR languages have higher levels of (and greater quality) goodwill impairment than those in countries that use strong FTR languages.

Target population

We used a sample of 15,179 firm-year observations taken from firms reporting under IFRS across 21 countries for the fiscal years 2005 to 2018.

Adopted methodology

Tobit regressions, logit regressions, mixed-effects modelling, and propensity score matching analyses for robustness.

Analyses

We tested the relationship between FTR in languages and (a) goodwill impairment decision, (b) goodwill impairment amounts, and (c) abnormal goodwill impairments. We repeated our main analyses using several sub-samples, different measures of FTR, and alternative regression specifications.

Findings

In line with the linguistic relativity hypothesis, our findings indicate that managers who speak weak FTR languages are more willing to bear the costs of their impairment decisions in the present and are less motivated to shift current impairment into future accounting periods. In contrast, speakers of strong FTR languages tend to delay the recognition of current impairments to future periods to reduce their anxiety about the negative effects of current impairment decisions. Findings from further analysis indicate that firms in countries that use weak FTR languages report lower abnormal goodwill impairment, thereby bringing impairment levels closer to their normal optimal levels. Our inferences are robust to alternative samples, different measures of FTR, and alternative model specifications.

Keywords: Goodwill impairment; language; religiosity; culture.

"Men imagine that their minds have command over language but it often happens that language bears rule over their minds."
– Francis Bacon

1. Introduction

Numerous studies have examined the relationship between firms' goodwill impairments and their economic fundamentals and managerial incentives (e.g., Beatty & Weber, 2006; Riedl, 2004). However, most of these studies have been conducted in single-country settings. In recent years, a new stream of research has emerged, which has focused on cross-country evidence on goodwill impairment (Glaum *et al.*, 2018). Despite the cross-country settings, these studies have focused mainly on formal institutions, such as investor protection (Knauer & Wöhrmann, 2016). Relatively little attention has been paid to informal institutions, such as culture and religiosity (Alshehabi *et al.*, 2021; Mazzi *et al.*, 2018).

Furthermore, linguistic features, such as future tense marking, have been ignored although these are important variables in cultural studies. Arguably, the linguistic differences between languages are the most important societal element influencing human behavior (Chen, 2013; Kim *et al.*, 2017; Mavisakalyan *et al.*, 2018). This is true because "a language's grammatical structure is a stable feature inherited from the distant past, unbiased by present social, political and economic forces" (Santacreu-Vasut *et al.*, 2017, p. 194); this in turn makes linguistic research less vulnerable to endogeneity problems than cultural research. Supporting this viewpoint, Huang and Kim (2020) stated, "Human beings are exposed to languages earlier than they are exposed to any other potential factors, such as religion, law, regulation" (p. 756). Several linguistic studies have found evidence that suggests that language-specific patterns can be established quite early: sometimes as early as at 12 to 14 months of age (e.g., Farwell, 1977; Gruendel, 1977; Nelson, 1974) and are often present by 20 months of age (e.g., Choi & Bowerman, 1991; Ingram, 1971; Tomasello, 1987).

Studies have suggested that in addition to their primary function as a vehicle for communication, languages may affect speakers' cognition and (non)linguistic behaviors (Boroditsky, 2001; Casasanto, 2008; Mavisakalyan & Weber, 2018; Whorf, 1956). Specifically, differences between languages in terms of time perception have been found to explain the variations in the savings behaviors of individuals (Chen, 2013), the environmental behavior and policies at the individual- and country-level (Mavisakalyan *et al.*, 2018), firms' social responsibility policies and research and development (R&D) investment (Liang *et al.*, 2018), corporate savings behaviors (Chen, *et al.*, 2017), earnings management practices (Kim *et al.*, 2017), corporate investment decisions (Kim *et al.*, 2020), firms' tax avoidance behaviors (Chen, *et al.*, 2017; Kim *et al.*, 2017), and, more recently, individuals' religious choices (Mavisakalyan *et al.*, 2022).

The obligatory marking of future events in a language increases the psychological distance from the future, which, in turn, causes its speakers to perceive these events as temporally more distant (Chen, 2013; Dahl, 2000; Thieroff, 2000). In this study, we argue that differences in the grammaticalization of *future-time reference* (*FTR*) affect goodwill impairment decision-making. Accordingly, we hypothesize that, compared with managers who speak *strong FTR languages* (e.g., English and French), those who speak *weak FTR languages* (e.g., German and Finnish) perceive future impairment losses at a greater level and, therefore, are less motivated to shift current impairment into future accounting periods. Because of their biased time perceptions, firms located in countries that use weak FTR languages (i.e., countries, such as Germany, where speakers perceive the adverse consequences of future events as more immediate) are more willing to bear the costs or risks of their impairment decision in the present and are, therefore, less motivated to shift impairment losses between future and present periods. Similarly, because strong FTR language speakers disassociate the future from the present, they feel more disconnected from the future consequences of their impairment decisions. Because

of their short-term orientation (Liang *et al.*, 2018), managers who speak strong FTR languages are more likely to manipulate the reporting of goodwill impairment by intentionally shifting current impairment into future accounting periods. This is to reduce their anxiety about the negative effects attributed to recognizing goodwill impairment in the current period because these effects appear more costly than future ones.

We focus on goodwill in the current study for several reasons. First, goodwill is an important item on firms' balance sheets. This is because it accounts for a significant number of firms' assets (Tsalavoutas *et al.*, 2014), it provides information on the economic value of a firm (Al Jifri & Citron, 2009; Barth & Clinch, 1996), and a decline in its carrying amount results in material stock market reaction (Bens *et al.*, 2011). Second, the decision to impair goodwill and how much to impair is left to managers' discretion, which can be used opportunistically to delay or accelerate goodwill impairments and to manipulate the amount of impairment (Li & Sloan, 2017). This makes it a unique case to test theories that explain financial reporting choices (Amel-Zadeh *et al.*, 2021). Third, accounting for goodwill remains "the subject of intense debate in academia, and in the professional and regulatory worlds" (Giner & Pardo, 2015, p. 36). The recent high-profile failures of Carillion and Thomas Cook in the UK, for example, has intensified the debate on goodwill accounting. In such debt-heavy acquisitive companies with lots of impairable goodwill, it is unclear why goodwill was left unimpaired for periods longer than is reasonably justifiable. Just months before their insolvency, the two companies were forced to impair more than £1 billion of their goodwill asset (Ford, 2018; Kinder, 2019).[1] Not surprisingly, goodwill remains on the agendas of the International Accounting Standards Board (IASB).

[1]Thomas Cook's goodwill was consistently at least double the firm's market value for most of the 2007–2018 period.

We used a large sample of 15,179 firm-year observations from firms reporting under IFRS across 21 countries for the fiscal years 2005–2018. Our analysis results showed that the effect of weak FTR languages on the likelihood and the magnitude of goodwill impairment was positive and statistically significant, after we controlled for various properties of formal institutions (*legal enforcement*, *investor protection*, and *legal right*), country-specific cultural characteristics (*religiosity*, *individualism*, *power distance*, *masculinity*, and *uncertainty avoidance*), and firm-level characteristics that have been reported to correlate with goodwill impairment.

Our main results remained robust on controlling for additional firm-level variables, language evolution, and after excluding observations from the biggest countries, which constituted a substantial proportion of the data set that we analyzed. We then used two continuous measures of FTR intensity that were developed by Chen (2013), verb ratio and sentence ratio, and performed the same tests. Our results confirmed the positive and significant association between weak FTR languages and goodwill impairments. Further analyses showed that managers who spoke weak FTR languages tended to report lower abnormal goodwill impairment and, thus, avoided reporting impairment losses that deviated from their optimal levels. In addition, the positive relationship between weak FTR languages and goodwill impairment was not driven by firms' incentives to take a big bath.

Thus, our study makes several contributions to the existing literature. First, prior studies on goodwill and asset impairment have focused mainly on firms' economic and reporting incentives, regardless of their country-specific context. As d'Arcy and Tarca (2018) suggested, "There is a lack of cross-country evidence regarding factors affecting goodwill accounting" (p. 203). Through this study, we aim to fill this gap in the literature on goodwill and asset impairment by simultaneously investigating the effects of formal and informal institutions—with special emphasis on the grammatical structures of languages—on the reporting of

goodwill impairment in cross-country settings, which allows us to embed goodwill impairment decision-making within its cultural and institutional contexts. With our research, we demonstrate the importance of understanding goodwill impairment decisions in their social and cultural contexts.

Second, and most importantly, to date, no study has considered the effects of the structural differences between languages on goodwill impairment outcomes. In this respect, Amel-Zadeh *et al.* (2021) argued in favor of a broader theoretical perspective and the greater use of behavioral theories to explain the psychological and sociological factors that shape goodwill-related reporting. Thus, the present study fills a major gap in the goodwill and asset impairment literature—it is the first study to conceptualize and empirically test the proposed relationship between FTR and impairment decisions. This is an important lens through which to understand intertemporal decisions: decisions that involve balancing present outcomes against future ones, that is, deciding whether to bear the burden of impairment decisions in the present period or delay it for the future. Through this study, we demonstrate that the tendency of managers to intentionally shift current impairment into future periods depends—at least partially—on linguistic biases in time perception and timing uncertainty about future losses. By doing so, we introduce language heterogeneity as a novel explanation for the motivations behind the reporting of goodwill impairment.

Third, our study contributes not only to the goodwill and asset impairment literature but also to the literature that examines the factors that shape the quality of financial reporting across countries, especially after adopting IFRS, by focusing on a specific negative accrual—goodwill impairment. The use of goodwill impairment provides a more powerful test than tests that use aggregate proxies of accruals and conservatism. The reason is that accounting impairment is directly measurable (Chung & Hribar, 2021) whereas empirical models that are used to capture earnings characteristics have been the subject of controversy (see Collins *et al.*,

2014; Dechow *et al.*, 2010; Hribar & Nichols, 2007; Leuz & Wysocki, 2016). Unlike earnings management studies that primarily rely on accruals models which "cannot be used to identify distortions induced by long-term accruals" (Dechow *et al.*, 2010, p. 360), impairment models are more likely to reflect accounting distortion which is important for evaluating accounting quality (ibid).[2] In line with this argument, Ayres *et al.* (2019) asserted, "(1) impairments are significant events in and of themselves and (2) they are easier to identify (and thus easier to design empirical tests around) than earnings management and conservatism" (p. 1218).

Last, the fourth contribution is of a methodological or modeling nature because our approach to examining the effect of language on goodwill impairment goes beyond the basic explanation that relies on goodwill impairment decisions and amounts and incorporates analysis on abnormal goodwill impairment (which has been overlooked in the literature on goodwill accounting). This analysis allows us to distinguish between "discretionary" and "nondiscretionary" or "normal" goodwill impairment and, thus, better understand whether the higher tendency of firms in countries that use weak FTR languages to recognize goodwill impairment is economically justified—that is, whether these firms are less likely to deviate from the optimal level of impairment.

The rest of this study is organized as follows. In Section 2, we review related research and develop our linguistic hypothesis. In Section 3, we describe the data and research design. In Section 4, we report our main empirical results. In Section 5, we discuss our additional tests and further evidence. Last, in Section 6, we outline our conclusions.

[2]Managers may avoid recording impairment losses for reasons that have nothing to do with overstating earnings. For example, managers may have incentives to delay the recognition of goodwill impairments to avoid giving the impression that they made a bad investment decision (Rennekamp *et al.*, 2015), thereby protecting their reputation. In that sense, they tend to defer the negative impacts of impairment losses to future periods (Roychowdhury and Martin, 2013).

2. Background and Hypothesis Development

2.1. Background on the goodwill/impairment approach and its implementation

Under IFRS, goodwill should not be amortized, and it instead must be tested for impairment in compliance with IAS 36, at least annually, or more frequently if indicators of impairment exist. An impairment loss should be recognized if the carrying amount of the cash-generating unit (CGU) to which goodwill has been allocated exceeds the recoverable amount of the unit, which is the higher of the fair value less costs of disposal and value in use.

This impairment-only approach requires significant amounts of judgement and estimates in respect of the inputs and parameters that are used to determine the recoverable amount, and that judgement depends in part on the environment in which impairment decisions are made. Prior research (Filip *et al.*, 2015; Glaum *et al.*, 2018) suggests that the impairment test leaves a good deal of discretion to managers in terms of the magnitude and timing of goodwill impairments. Managers may therefore use the impairment discretion to manage the level and variability of goodwill impairments by either delaying or accelerating recognition of impairments in goodwill (Glaum *et al.*, 2018; Li & Sloan, 2017). It is not surprising that managers who overpaid in acquisitions are much less likely to acknowledge their overpayments, "so instances of firms declaring their goodwill as impaired are rare" (Ramanna, 2015).

2.2. Background on goodwill impairment studies

Studies on goodwill impairment can be classified into two main categories: single-country and multiple-country studies. A substantial number of single-country studies have focused on understanding the determinants of goodwill impairments. In several studies, goodwill impairments have been associated with stock market returns (e.g., Lapointe-Antunes *et al.*, 2009; Li *et al.*, 2011), future cash flows (e.g., Bostwick *et al.*, 2016; Jarva, 2009), investment opportunities (e.g., Chalmers *et al.*, 2011), agency-based incentives (e.g., Ramanna & Watts,

2012), the level of analyst following (e.g., Ayres *et al.*, 2019), auditor industry specialization (e.g., Stein, 2019), the disclosure of the use of a valuation expert (e.g., Gietzmann & Wang, 2020), or non-audit fees and auditor independence (e.g., Carcello *et al.*, 2020).

Although studies thereof offer valuable insights into firms' recognition of goodwill impairments, their findings have been generally mixed and inconclusive, because they have covered a one-country setting at one particular time, or they have looked only at the impairment decision, rather than the goodwill impairment amounts, or they have examined goodwill impairment losses without reference to their institutional settings, thus raising concerns about the generalizability of their findings. As Hong *et al.* (2018) assert, "firms are able to manipulate earnings through asset impairments within specific country settings. Cross-national research also implies that differences in institutional factors influence that behavior" (pp. 77-78).

In the last few years, a new stream of research has emerged in international accounting literature analyzing selected institutional factors and their influence on firms' disclosures relating to goodwill (Mazzi *et al.*, 2018); goodwill impairment tests (Andreicovici *et al.*, 2020); business combinations and impairment testing of assets (Glaum *et al.*, 2013); the timeliness of goodwill impairment losses (Amiraslani *et al.*, 2013); investor reaction to the announcements of unexpected goodwill impairments (Knauer and Wöhrmann 2016); the determinants and timeliness of firms' goodwill impairment decisions (Glaum *et al.*, 2018), and recently the relevance of impairment information (Alshehabi *et al.*, 2021). As such, cross-country research on goodwill impairments has focused mainly on formal institutions, paying relatively little attention to informal institutions. Notably, no study has considered the effect of language on the reporting of goodwill impairment.

2.3. Theoretical background and hypothesis development

2.3.1. Linguistic relativity, or the Sapir–Whorf hypothesis

In his account of the effects of language on individuals' economic behaviors, Chen (2013) argued that "languages differ widely in the ways they encode time" (p. 690), and he divided languages into two main categories based on the way they encode present and future events:

- Futured or strong FTR languages (e.g., English) require speakers to mark the distinction between present and future events by using a grammatical future marker (Dahl, 2000; Thieroff, 2000), such as "will" or "is going to," as in, "It will rain tomorrow," and thereby make speakers feel more psychologically distant from the future.
- Futureless or weak FTR languages (e.g., German) do not require a grammatical separation of present and future events and, hence, their speakers can talk about the future in much the same way in which they talk about the present.

For example, when making predictions about rain, a German speaker would use the present tense to say, "Morgen regnet es," which translates to "It rains tomorrow." In this way, speakers of weak FTR languages locate future events closer to their current temporal position and, thus, tend to discount future rewards and costs[3] less than speakers of strong FTR languages. By increasing the perceived distance from the future, strong FTR languages reduce the psychological importance of future events (Liang *et al.*, 2018) and, thus, people's attitude toward future (and adverse) outcomes of their current behaviors. This leads speakers to disassociate the future from the present, which causes them to devalue future rewards and risks, that is, give future rewards or costs less value than present ones[4] (Dahl, 2000; Thieroff, 2000).

[3]Research has suggested that humans have a well-established tendency to discount future gains and losses (Frederick *et al.*, 2002; Kirby & Herrnstein, 1995; Ramsey, 1928; Solnick *et al.*, 1980), but discount losses less steeply than gains (Benzion *et al.*, 1989; Loewenstein, 1987; Thaler, 1981).

[4]According to Adam (2005), "This devaluation of the future makes perfect sense within a scheme that assumes that individuals act to maximize their self-interest" (p. 74).

In contrast to individuals who speak weak FTR languages, those who speak strong FTR languages feel that negative events are further away from the present (i.e., they appear more distant and, hence, less imminent), which leads to them discounting future events more often (Pérez & Tavits, 2017). This linguistically induced time perception encourages strong FTR speakers to defer potential outcomes with temporally immediate effects.

Indeed, many studies have suggested that people construct representations of future events depending on whether the event pertains to the near or distant future (e.g., Ainslie & Haslam, 1992; Gadenne *et al.*, 2011; Loewenstein & Elster, 1992; Mischel *et al.*, 1969, 1989; Read & Loewenstein, 2000). In particular, people tend to discount the future and, thus, place a higher value on near future events than on distant future events. For example, they will choose a smaller immediate reward and discard a larger delayed one.[5] As Trope and Liberman (2003) argued, regardless of whether an outcome is positive or negative, "The value of outcomes is discounted or diminished as temporal distance from the outcomes increases" (p. 404). In their discussion of the phenomenon of temporal discounting,[6] Mavisakalyan *et al.* (2018) stated, "The further in the future an outcome seems, the more we discount its potential costs or benefits" (p. 1372). In that sense, languages affect speakers' intertemporal choices by changing how distant future events feel (Chen, 2013). According to Atasoy (2013), "Language can move the future back and forth in our mental space and this might have dramatic influences on our

[5]In his discussion of the famous Stanford marshmallow experiment on delayed gratification, conducted in 1972 and led by psychologist Walter Mischel, a professor at Stanford University, Atasoy (2013) provided a rigorous argument in support of Chen's (2013) linguistic–savings hypothesis. Atasoy stated, "Some people are better at delaying gratification than others. Those people have a better chance of accumulating wealth and keeping a healthy lifestyle. They are less likely to be impulse buyers or smokers, or to engage in unsafe sex" (p. 1). In an intertemporal choice experiment with primary school children in a bilingual city in Northern Italy where half of the population speak German (a weak FTR language) and the other half speak Italian (a strong FTR language), Sutter *et al.* (2015) found evidence that supported the original proposition by Chen (2013) that German-speaking primary school children were more patient in their choices and were about 46% more likely than Italian-speaking children to delay gratification.

[6]Temporal discounting can be defined as "any reason for caring less about a future consequence, including factors that diminish the expected utility generated by a future consequence, such as uncertainty or changing tastes" (Frederick *et al.*, 2002, p. 352).

judgments and decisions" (p. 4). This argument is in line with the principle of *linguistic relativity*, or *the Sapir–Whorf hypothesis* (often called *the Whorfian hypothesis*), which suggests that language systematically changes the way people think and behave (Whorf, 1956), or one's mental representations or simulations that are built up in the process of *thinking-for-speaking* (Slobin, 2003). Nonetheless, the Sapir–Whorf hypothesis has been regarded as misguided for decades. As Pinker (1989) stated:

> Whorf was surely wrong when he said that one's language determines how one conceptualizes reality in general. But he was probably correct in a much weaker sense: one's language does determine how one must conceptualize reality when one has to talk about it (p. 360).

In commenting on the Sapir–Whorf hypothesis, Clark (1996) stated:

> Whorf seemed to take for granted that language is primarily an instrument of thought. Yet this premise is false. Language is first and foremost an instrument of communication—the "exchange of thoughts," as one dictionary puts it—and it is only derivatively an instrument of thought. If language has an influence on thought, as Whorf believed, that influence must be mediated by the way language is used for communication (p. 325).

Nevertheless, the Sapir–Whorf hypothesis has experienced a revival, and there is now a substantial and ever-growing body of empirical literature that verifies its validity (Boroditsky, 2001; Levinson & Wilkins, 2006; Slobin, 2003). In particular, Chen (2013) empirically examined the degree to which linguistic differences between strong and weak FTR languages determine speakers' choices about their future (e.g., saving, exercising, smoking, condom use, and long-term health decisions). He found evidence that speakers of weak FTR languages feel that the future is very close to the present and, therefore, they engage more in future-oriented actions and are more willing to accept short-term costs in return for long-term rewards. Specifically, they tend to save more money, keep more retirement savings, and smoke less, and they are less likely to be obese and more likely to enjoy better long-term health. In contrast, speakers of strong FTR languages are less willing to sacrifice the present for the future (i.e., were short-term oriented) and, therefore, tend to engage in less future-oriented behaviors.

Specifically, they tend to save less and smoke more, and are less physically active and more medically obese. Chen found that these findings held across countries: countries that have weak FTR languages save more of their gross domestic income per year than countries that have strong FTR languages.[7]

In addition, Chen *et al.* (2017) extended the linguistic hypothesis to the analysis of corporate savings behavior. They found that firms from countries where the official language is classified as having weak FTR (e.g., Chinese) display a greater propensity for precautionary cash holdings than their counterparts from countries with strong FTR languages (e.g., English). Thus, they provided evidence of a more cautious or future-oriented approach to intertemporal economic decisions among the former group of countries. Their results about the effect of FTR on corporate savings behavior remained robust on the inclusion of controls for language evolution, such as colonization, geographical relatedness, and historical language families.

Significantly, several empirical studies have provided evidence in support of the findings of Chen (2013). In particular, Mavisakalyan *et al.* (2018) provided empirical evidence to support the idea that language shapes how people think about the future and how they plan for it. They found speakers of weak FTR languages to be more future oriented and, therefore, more likely to engage in behavior that prevented environmental damage than those whose language refers to future time. These findings supported those of Liang *et al.* (2018), who examined how obligatory FTR in a language affects the future-oriented activities of corporations by using a sample of global firms across 59 countries during the period 1999–2011. In their support of the linguistic hypothesis, Liang *et al.* found that firms located in

[7]Roberts *et al.* (2015) replicated Chen's study to test his savings hypothesis using a regression on matched samples and applying additional controls for historical and geographical relatedness of languages. They found that the effect of FTR on savings behavior weakened in terms of significance after controlling for the relatedness between languages.

countries with strong FTR languages engage in less future-oriented behavior, such as social responsibility and sustainability activities.

Recently, Chi *et al.* (2020) empirically examined the relationship between the FTR of a language and R&D investment. They found weak FTR to be significantly associated with an increase in countries' and firms' propensity to invest more in R&D activities, which mirrors the long-term orientation of weak FTR language speakers and their tendency to perceive future concerns as more pressing. Consistent with this finding, Huang and Kim (2020) argued that the FTR of a language affects its speakers' evaluation of future costs but not current ones. Compared with speakers of strong FTR languages, those who speak weak FTR languages worry more about future costs and care less about current ones. This is particularly true because the latter group perceives future events to be closer and, thus, tends to apply lower discount rates (Chen, 2013). Therefore, these individuals' current perceived value of future costs will always be greater than that perceived by speakers of strong FTR languages.

In summary, the existing research has supported the view that weak FTR languages reduce the psychological distance of the future, leading their speakers to discount the future less and engage more in future-oriented behaviors. However, little research has attempted to understand the role of language in shaping corporate financial reporting. The only notable example is the study by Kim *et al.* (2017), who examined the effect of the grammatical structure of languages on earnings management practices. They theorized that managers in countries that had strong FTR languages engage in more short-term oriented accounting practices, such as earnings management activities, because their languages grammatically separate the future from the present. This separation causes managers to perceive the potential future negative consequences of earnings management (e.g., CEO dismissal, litigation risk, or financial restatements) as more distant and, therefore, less imminent. Their study provided evidence that earnings management behavior is more common in countries where there is a strong time

disassociation in the language.[8] Indeed, two recent studies (Cheng *et al.*, 2021; Na & Yan, 2022) revealed significant evidence about tax avoidance behavior and suggested that tax avoidance is high in countries where strong FTR languages are spoken.

Kim *et al.* (2020) extended the linguistic–savings hypothesis of Chen (2013) to the analysis of important resource-allocation decisions, such as corporate investment decisions, using a sample of firms from 37 countries in which the languages used differ in the way they encode time. They found evidence that underinvestment is less pronounced in weak FTR speaking countries, which is consistent with the idea that speakers of weak FTR languages avoid decisions that lead to negative future consequences because these (i.e. consequences) seem temporally closer to the present and, hence, more imminent.

2.3.2. Hypothesis development (FTR in languages and goodwill impairment)

Consistent with Chen's (2013) linguistic–savings hypothesis, we argue that the FTR in languages can affect managers' intertemporal choices in regard to goodwill impairment (i.e., whether to impair, how much to impair, and when to impair). To clarify this, weak FTR language speakers have greater long-term orientation (Chen, 2013) and a correspondingly reduced psychological distance from the future (Dahl, 2000; Thieroff, 2000), which leads them to perceive the negative consequences of their (future) impairment decisions as temporally closer to the present and, hence, more imminent. Because of their biased time perception and greater timing uncertainty about future losses, speakers of weak FTR languages are less likely to discount the negative future consequences of their impairment decisions (i.e., because the psychological distance between the present and the future is so close).

[8]Gotti *et al.* (2021) extended Kim *et al.*'s (2017) analysis by using a new dataset from a wide range of countries (with controls for linguistic history). They examined the relationship between FTR and accrual-based earnings management. Interestingly, Gotti *et al.* found no evidence in support of Kim *et al.*'s study. Instead, their results showed that the effect of FTR on earnings management disappears after controlling for language families (e.g., Indo-European languages).

Given that the negative impact of impairment decisions in the current period is deferred into future periods and that the speakers of weak FTR languages place more weight on the future (Chen, 2013; Sutter *et al.*, 2015), it stands to reason that firms in countries that use weak FTR languages are likely to avoid goodwill impairment decisions that bring negative (future) consequences. In particular, weak FTR language speaking firms are more willing than their strong FTR language counterparts to bear the costs and the risks of their impairment decisions in the present period and have less motivation to shift impairment losses between future and present periods. This may result in the former group of firms engaging in more responsible behavior than the latter group when evaluating the consequences of their impairment decisions.

Similarly, because strong FTR language speakers disassociate the future from the present, which appears psychologically more distant to them, they feel removed from the negative impact of their impairment decision. This means that managers who speak strong FTR languages make less impairment decisions. In particular, they are likely to shift current impairment into future accounting periods to reduce their anxiety about possible adverse outcomes resulting from the recognition of the impairment losses in the current period, which appear more costly than future ones. It has been suggested that temporal discounting affects managers' intertemporal preference structure (Mavisakalyan *et al.*, 2018; Pérez & Tavits, 2017; Trope & Liberman, 2003) so that future impairment appear temporally more distant.[9] Therefore, they are less costly to managers who speak strong FTR languages, compared with those who speak weak FTR languages.

Given their different intertemporal preferences, managers who speak strong FTR languages are expected to make less impairment decisions because they worry more about the

[9]Na and Yan (2022), in the context of tax avoidance, suggested that managers of firms in countries that use strong FTR languages perceive future costs associated with tax avoidance (i.e., tax repayments, interests, penalties, and reputational costs) to be more distant.

(current) effects of their impairment decisions, which typically incur immediate costs.[10] However, these costs are located relatively far in the future for speakers of strong FTR languages. This encourages them to delay the recognition of any impairment losses—even in the presence of strong impairment indicators. This can happen, for example, if the impairment is judged to be *temporary*, and then the goodwill does not need to be written down. The application of the impairment standard is subjective and, thus, facilitates the exercise of discretion. As Roychowdhury and Martin (2013) suggested, "Managers can delay recording write-downs, with the objective of overstating earnings and deferring the negative impact of these write-downs to future periods" (p. 136).

In addition, strong FTR language speakers place a greater emphasis on quick results and the bottom line, that is, short-term orientation[11] (Liang *et al.*, 2018) and will, thus, have greater incentives (relative to speakers of weak FTR languages) to manipulate the impairment reporting by shifting the current period impairment to avoid adverse consequences in the short term, such as loan defaults. Consistent with this argument, prior research has suggested that accruals manipulation is more prevalent in countries with strong FTR languages (Kim *et al.*, 2017) or short-term oriented cultures (Haga *et al.*, 2019). This underemphasized view on the negative future consequences leads us to expect relatively less impairment losses in countries with strong FTR languages. Indeed, this is what our study finds.

[10]Impairments are detrimental because it means that the acquiring firm is throwing away good money after making a bad investment decision and, thus, it is missing an opportunity to grow (Rennekamp *et al.*, 2015). Impairment may also result in a loss of market share (e.g., Hirschey & Richardson, 2002) or lead to a lower credit rating (Sun & Zhang, 2017).

[11]In discussing managers' incentives for accounting manipulation, Doupnik (2008) argued that most of these incentives focus on achieving immediate or short-term goals: "Most of these incentives relate to an immediate benefit to be enjoyed, such as a bonus, or an immediate harm to be avoided, such as a drop in stock price" (p. 322). This view is consistent with that of Haga *et al.* (2019), who asserted, "Manipulation is a short-term instrument" (p. 100).

In line with this discussion, we predict that the properties of goodwill impairment for firms located in countries that have weak FTR languages differ from that of their counterparts in countries with strong FTR languages. In particular, the goodwill impairment of firms in countries where the main language is a weak FTR language will be larger and more economically viable. That is, they not only report higher levels of goodwill impairment but also impairment of greater quality. Therefore, we present our hypothesis in an alternative form:

H1: *Firms in countries that use weak FTR languages have higher levels of (and greater quality) goodwill impairment than those in countries that use strong FTR languages.*

3. Data and Research Design

3.1. Sample and data

Our initial sample included 103,082 firm-year observations from Datastream for domestically listed firms located in countries that require the use of IFRS in consolidated financial statements. We excluded 39,830 financial firm-year observations: 2,511 with negative book value of equity and 38,630 with negative or zero goodwill. We also excluded 3,144 non-IFRS observations and 3,788 firm-year observations with missing data. Our final sample included 15,179 firm-year observations from 21 IFRS-adopting countries over a 14-year period (2005–2018). Table 1 presents the breakdown of the sample by strong FTR language countries (Panel A), weak FTR language countries (Panel B), and by year (Panel C).

[Insert Table 1 near here]

3.2. Language measures

In this study, we adopt Chen's (2013) languages coding which separates languages into two broad categories:[12]

[12]Chen (2013) categorized languages as weak FTR if they were classified as 'futureless' by Dahl (2000), who summarized the results of the European Science Foundation's Typology of Languages in Europe (EUROTYP) project, and as strong FTR otherwise.

- Strong FTR languages (e.g., English) that require speakers to grammatically mark the distinction between present and future events.
- Weak FTR languages (e.g., German) that do not require the obligatory grammatical encoding of FTR.

Thieroff (2000) defined weak FTR languages as those in which "the future is not obligatory in sentences with future-time reference" (p. 288). That is, speakers of weak FTR languages are not obliged to use future tense markers to talk about future events; they can habitually do so in the present tense (e.g., in German, the use of future verb tense is uncommon).[13] Thus, Dahl (2000) called such languages *futureless*. German, Finnish, and Swedish are examples of weak FTR languages. However, the speakers of non-weak FTR languages are required to use future tense markers to grammatically mark the distinction between present and future events. These languages (e.g., English) are called strong FTR languages and in these languages "will" or "is going to" are used to make predictions, as in, "It will be sunny tomorrow."

As a robustness test, we also adopted two continuous measures of FTR, the *verb ratio* and the *sentence ratio*, developed by Chen (2013), who used a word-frequency analysis of the texts of weather forecasts that were retrieved from the Internet in 39 languages. In a language, the *verb ratio* (*sentence ratio*) is the frequency of verbs (sentences) that are grammatically future marked relative to the total number of verbs (sentences). Using these two continuous measures of FTR rather than the binary weak-vs-strong distinction allows us not only to capture

[13]Although weak FTR languages do not force their speakers to talk in a distinct way about future events, this does not mean that speakers of weak FTR languages are unable (or less able) to understand the difference between the present and the future. It only means that they are not required to use the future verb tense every time they speak about the future. This difference in the obligatory marking of future events is a central characteristic of the weak versus strong FTR classification (Thieroff, 2000).

variations in the degree of FTR between languages but also different levels of FTR within the same FTR group.

3.3. Empirical models

3.3.1. Main models

To examine the association between language and goodwill impairment losses, we applied the following Tobit model:

$$\boldsymbol{GWI_{i,t} = \beta_0 + \beta_1 Weak\text{–}FTR + Country\text{–}level\ controls\ + Firm\text{–}level\ controls} \\ \boldsymbol{+ Industry\ fixed\ effect + Year\ fixed\ effect + \varepsilon}\ (\mathbf{1})$$

where $GWI_{i,t}$ represents firms' reported goodwill impairment losses divided by the amount of goodwill at the end of year *t*-1 (Beatty & Weber, 2006).[14] Given that the values of the dependent variable ($GWI_{i,t}$) are either 0 or positive and there is a high proportion of observations with 0 goodwill impairment, we used the Tobit model instead of using ordinary least squares, which would have produced biased coefficient estimates when observations were censored. Similar to Riedl (2004), we took the stance that the Tobit model captured two simultaneous, rather than sequential, decisions: the decision whether to impair goodwill and the decision on the amount of impairment (i.e., how much to impair). In support of this view, Roychowdhury and Martin (2013) suggested that "the timing and magnitude decisions are expected to be linked" (p. 136).

To reconcile with the evidence from goodwill impairment studies that have employed a logit model (e.g., Glaum *et al.*, 2018), we also estimated a logit model:

[14]In an alternative specification, we defined our dependent variable as the ratio of goodwill impairment loss (reflected as a positive number) to lagged total assets if the firm recorded goodwill impairment in the current fiscal year and 0 otherwise. The results (untabulated) showed that the coefficient of *Weak-FTR* remains significantly positive.

$$IMP_{i,t} = \beta_0 + \beta_1 Weak\text{–}FTR + Country\text{–}level\ controls + Firm\text{–}level\ controls + Industry\ fixed\ effect + Year\ fixed\ effect + \varepsilon \quad (2)$$

where $IMP_{i,t}$ represents a binary variable that takes the value of 1 if a firm reports goodwill impairment loss in a given year, and 0 otherwise. In both models, the independent variable of interest, *Weak-FTR*, is an indicator variable equal to 1 for countries with weak FTR languages and 0 otherwise (Chen, 2013).

To isolate the linguistic effects from potentially confusing factors that may affect goodwill impairments, we applied many country and firm control variables to both models. More specifically, we controlled for the possible effects of cultural traits other than language on goodwill impairments by including several variables in the analysis. These were individualism, power distance, uncertainty avoidance, and masculinity, obtained from Hofstede's website, as well as religiosity using the *2009 WIN-Gallup International Global Index of Religiosity and Atheism*. For a complete comparative institutional analysis, however, both formal institutions (laws and regulations) and informal institutions (culture and traditions) should be included simultaneously (Halabi *et al.*, 2019; Helmke & Levitsky, 2004). Therefore, we controlled for the strength of legal right (Molyneux *et al.*, 2019), investor protection (Groh *et al.*, 2010), and enforcement (Siekkinen, 2016). We further accounted for the effect of macroeconomic conditions on goodwill impairment losses by including the *annual growth rates for GDP* (*GDP growth*) in the model.

Following the literature (e.g., Beatty & Weber, 2006; Riedl, 2004; Glaum *et al.*, 2018), we included several firm-level controls. These were the relative size of *goodwill to total assets* (*GWA*), the *market-to-book ratio* (*MTB*), the *change in operating cash flows* (*ΔOCF),* the *change in sales* (*ΔSALES*), the *change in return on assets* (*ΔROA*), *financial leverage* (*LEV*), *big bath* (*BATH*), *earnings smoothing* (*SMOOTH*), and *firm size* (*SIZE*). We also included three governance variables that have been used in the literature (e.g., Glaum *et al.*, 2018). The first,

free float, is the percentage of the firm's shares that are freely available for trading in the market. The second, *BIG 4*, is a dummy variable that takes the value 1 if the firm's auditor is one of the BIG 4 auditors, and 0 otherwise. The third, *analyst following*, is the average number of analysts following the firm. We provide the definitions for the variables in Appendix A.

Finally, we controlled for heterogeneity across industries and years by including industry and year fixed-effect dummy variables, and clustered the standard errors by country and year, in line with other studies (e.g., Borensztein *et al.*, 2013; Cheng *et al.*, 2021), to obtain efficient estimates of coefficients.

3.3.2. Abnormal and unexpected goodwill impairment models

To investigate whether the greater tendency of firms in countries with weak FTR languages to recognize goodwill impairment is economically justified, we ran an analysis using the abnormal goodwill impairment as a dependent variable. In the first stage, we estimated the abnormal goodwill impairment losses. To that end, we first regressed the reported goodwill impairment losses on the economic determinants to predict the normal goodwill impairment losses using a robust ordinary least squares regression:

$$\boldsymbol{GWI_{i,t} = \beta_0 + \beta_1 GWA_{i,t} + \beta_2 MTB_{i,t} + \beta_3 \Delta OCF_{i,t} + \beta_4 \Delta SALES_{i,t} + \beta_5 \Delta ROA_{i,t} + \beta_6 GDP\ Growth_{i,t} + \varepsilon_{i,t}} \quad (3)$$

From this regression, we first calculated the predicted losses and then adjusted them by resetting the normal loss to 0 if the predicted value was negative because the distribution of the reported goodwill impairment losses was censored. The difference between the adjusted predicted losses and the reported losses is the *abnormal goodwill impairment losses* (*AGWI*). Positive (negative) *AGWI* denotes overstatements (understatements) of goodwill impairment losses. In the second stage, we regressed the absolute values of *AGWI* on *Weak FTR* and other country- and firm-level variables that were not included in Model 3.

Further, we conducted a test to understand whether a higher level of goodwill impairment for firms in countries that use weak FTR languages should be expected, or in other words, whether it is economic or discretionary. As has been applied in the literature (e.g., Beatty & Weber, 2006; Bens *et al.*, 2011; Knauer & Wöhrmann, 2016), we first measured the expected impairment by using the difference between the firm's book value of equity and the market value of equity. If the market value of equity was greater than the book value of equity, then the expected goodwill impairment was set to 0. If the market value was lower than the book value, then the difference between those values was the expected impairment, subject to a cap on the previous year's goodwill balance. We then estimated the unexpected goodwill impairment losses as the difference between the actual goodwill impairment and the expected impairment.

4. Empirical Results

4.1. Descriptive statistics

Table 2 shows the descriptive statistics for all variables in the model. To mitigate the effects of extreme observations, we winsorized all firm-level continuous variables at the 1st and 99th percentile. The mean of the *goodwill impairment losses* (*GWI*) is 0.030 with a standard deviation of 0.594. The 75th percentile of *GWI* is also 0, indicating that most firms with goodwill do not impair goodwill. The mean value of *GWA* is 0.200, which suggests that goodwill represents, on average, 20% of total assets of firms with goodwill. In other words, goodwill constitutes a significant portion of total assets.

[Insert Table 2 near here]

Table 3 provides the Pearson's correlation coefficients and their statistical significance for the independent variables in our main regression. Most correlations are significant ($p < 0.05$); however, they are not highly intercorrelated, except for the correlation between *SIZE* and *analyst following*, which is 0.7467. This is not surprising given that large firms have

greater numbers of analysts following (Bhushan, 1989). The *variance inflation factors* (*VIF*s) indicate that multicollinearity is not a concern in our analysis because the VIFs are below the conventional threshold of 10.

[Insert Table 3 near here]

4.2. Main results

We hypothesized that language heterogeneity explains cross-country variation in goodwill impairment reporting. The results of the main analyses are displayed in Table 4. In Column (1), the coefficient of *Weak-FTR* is positive and significant at 5%. Similarly, the coefficient of *Weak-FTR* in Column (2) is positive and significant but at 1%. This supports our hypothesis that firms in countries that use weak FTR languages record goodwill impairment more frequently and in greater amounts than those in countries that use strong FTR languages.[15] Our findings add to prior studies that have concluded that linguistic variation explains speakers' economic behavior (Chen, 2013), corporate savings behavior (Chen *et al.*, 2017), firms' earnings management behavior (Kim *et al.*, 2017), and environmental behavior (Mavisakalyan *et al.*, 2018).

[Insert Table 4 near here]

Time, or temporal, discounting can have a notable effect on people's responses to future events (Trope & Liberman, 2003), which provides an explanation for our result. Generally, humans have a well-established propensity to discount future benefits and costs. However, speakers of non-obligatory future tense languages (i.e., weak FTR languages) have less temporal discounting compared with speakers of languages that use future tense (Mavisakalyan *et al.*, 2018). Therefore, managers in countries that use weak FTR languages are more likely to

[15]We also repeated the analysis after controlling for the 2008-2009 financial crisis. The untabulated results indicate that our findings on the positive relation between *Weak-FTR* and *GWI* are robust to the crisis.

impair goodwill because they do not disassociate the future from the present and, thus, do not feel that there is a sharp and salient difference in the negative impact of goodwill impairment in the present compared with in the future. For this reason, these managers do not have an incentive to shift impairment losses to future periods.

In contrast, managers from countries that use strong FTR languages perceive the negative impact of *future* goodwill impairment as less imminent than those reported in the current period because they more often discount future costs and, thus, delay the recognition of goodwill impairment. In other words, future impairment appears temporally more distant and seem less costly to strong FTR language speakers, who have strong incentives to shift current impairment into future accounting periods. By doing so, they reduce their anxiety about the possible negative outcomes that result from the recognition of the (current) impairment losses.

Turning to the culture control variables, the results in Column (1) indicate that religiosity is positive and significant at 1%, individualism and power distance are both positive and significant at 5%, masculinity is positive and significant at 10%, and uncertainty avoidance is not significant. Social norms theory provides an explanation for our finding that firms located in countries that have greater religious adherence tend to recognize goodwill impairment because of pressure from social networks. That is, the religious social norms of the area in which firm managers live and work influence their decision-making even if they are not affiliated with any religion (Cialdini & Goldstein, 2004).

In the case of power distance, firm managers who are in areas that are characterized by high power distance have reported higher levels of goodwill impairment because of social pressure from subordinates and outsiders and because of the formal norms that exist in these countries. Subordinates in high power distance countries would expect their interests to be protected by their superiors (Vitell *et al.*, 1993) in return for obeying orders (Javidan *et al.*,

2006). In addition, prior research has suggested that more formal norms are installed in countries with high power distance to protect subordinates from abuse by their superiors (Vitell *et al.*, 1993), which may lead managers to recognize goodwill impairment losses.

In individualistic cultures, people are more likely to comply with rules and laws, while in collectivist cultures, people tend to behave in accordance with the relationship that they have with those they are dealing with (Jackson, 2007). Therefore, in collectivist cultures, managers treat insiders differently than they do outside investors, while in individualistic cultures, managers act in accordance with legal rules and regulations and their own moral reasoning (Zhang *et al.*, 2013). This may explain our results that indicate a positive relationship between individualism and goodwill impairment because managers in these cultures are likely to comply with rules, which leads to higher levels of goodwill impairment recognition.

In regard to the country-level formal variables, enforcement, legal right, and investor protection, the results in Column (1) of Table 4 show that enforcement and investor protection are both positively related with goodwill impairment at 1% and legal right is significant at 5%. This suggests that firms in countries that have strong legal institutions are likely to recognize goodwill impairment because they fear the litigation and regulation costs that are associated with strong regulatory scrutiny.[16] This is consistent with the accounting literature that considers the importance of formal institutions in shaping accounting practices around the world and the

[16]We replaced the securities enforcement variable with an alternative measure of enforcement by using the average of six worldwide governance indicators and then repeated the analysis by using the first principal component of these six indicators. This index captured the country's overall regulatory environment, including legal enforcement, government effectiveness, and regulatory quality (Choi & Luo, 2021). The results (untabulated) showed that the coefficient of *Weak-FTR* remains significant and positive, consistent with our baseline results. The results are unaffected if we also add controls for the strength of enforcement of accounting standards or book-tax conformity. The results are also unaffected when we controlled for the strength of enforcement of accounting standards as developed by Brown et al. (2014), or the book-tax conformity obtained from Blaylock et al. (2015).

adoption of common accounting standards (Bonetti *et al.*, 2016; Doukakis, 2014; Halabi *et al.*, 2019).

As shown in Column (1) of Table 4, our last country-level control variable, *GDP growth*, is not significant, which indicates that macroeconomic factors are less significant than firm-level economic factors in explaining goodwill impairment. Indeed, *GWA* is positive and significant at 1%, while *MTB* is negatively significant at 1% and Δ*ROA* is negatively significant at 5%. It is unsurprising that firms that have greater amounts of *GWA* report higher levels of goodwill impairment (Ramanna & Watts, 2012). The negative relationship between *MTB* and goodwill impairment is consistent with the argument of Beatty and Weber (2006), who suggested that firms with greater growth potentials (i.e., a higher level of *MTB*) are often less likely to impair their goodwill. The findings on the negative association between Δ*ROA* and goodwill impairment are somewhat expected and confirm the findings of Francis *et al.* (1996), Glaum *et al.* (2018), and Riedl (2004).

Turning to the managerial incentives, *LEV* and *SMOOTH* are positive and significant at 5%, whereas *BATH* is not significant. The positive association between goodwill impairment and *LEV* may be explained by the fact that leverage reflects financial risk (Glaum *et al.*, 2018) and firms increase their leverage after mergers (Ghosh & Jain, 2000), which leads to higher levels of impairment losses. The findings on *SMOOTH* confirm the notion that managers may use asset impairment to avoid earnings volatility when earnings are unexpectedly high (Riedl, 2004). The findings on country-level variables and firm-level variables, as shown in Column (2), are similar to those revealed in Column (1).

4.3. Weak FTR and abnormal (and unexpected) goodwill impairment

In Column (1) of Table 5, the coefficient of *Weak-FTR* is negatively significant at 1% This result suggests a lower tendency of firms located in countries that use weak FTR languages to deviate from the optimal level of impairment; thus, they report lower (abnormal) goodwill

impairment. We repeated the analysis and used the positive values of *AGWI* in Column (2) and the negative values of *AGWI* in Column (3).[17] The coefficient of *Weak-FTR* in Column (2) is negatively significant at 1%, which indicates a lower tendency of firms located in countries that have weak FTR languages to report overstated goodwill impairment. In Column (3), the coefficient of *Weak-FTR* is positive and statistically significant at 1%, which implies that firms located in countries that have weak FTR languages are less likely to report understated goodwill impairment. These results indicate that firms located in countries that use weak FTR languages tend to report less abnormal goodwill impairment. Thus, as revealed in our initial analysis, their tendency to report higher levels of goodwill impairment is economically justified.

[Insert Table 5 near here]

Next, Column (1) of Table 6, which presents the results on using the absolute values of unexpected goodwill impairment as a dependent variable, shows that the coefficient of *Weak-FTR* is negatively significant at 1%. These results suggest that *Weak-FTR* is associated with economic goodwill impairment. On splitting the sample based on the sign of the unexpected goodwill impairment, the results in Column (3) indicate that *Weak-FTR* is positively associated with negative unexpected goodwill impairment, but as the results in Column (2) indicate, it is not significantly associated with positive unexpected goodwill impairment, which partially confirms our results in Column (1).

[Insert Table 6 near here]

These results indicate that firms in which a weak FTR language is used report goodwill impairments that are not only bigger but also of greater quality. In other words, managers from

[17]Positive (negative) abnormal goodwill impairment indicates an overstatement (understatement) in the recognition of goodwill impairment losses.

countries with weak FTR languages are less likely to shift current impairment into future accounting periods. Rather, they recognize current impairment when there are economic indicators to do so. That is, managers from countries that use weak FTR languages are likely to engage in nondiscretionary conservatism (Lawrence *et al.*, 2013). These managers fear the potential costs of violating accounting regulations, which appear to be very close. Managers from countries that use strong FTR languages, however, have strong incentives to shift current impairment into future accounting periods to reduce their anxiety about possible adverse outcomes resulting from the recognition of the impairment losses in the current period.

5. Additional Analyses

In this section, we performed several additional tests to examine whether our main results are not driven by big bath incentives, and robust to additional firm-level, alternative samples, alternative measures of FTR intensity in languages, and across different model specifications and estimations.

5.1. Additional firm-level controls

As managers may opportunistically report larger impairment losses when they have "big bath" incentives in certain periods (Riedl, 2004), we followed (Stein, 2019) and constructed a proxy dividing the firms into firms with big bath incentives ($BATH < 0$) and firms without big bath incentives ($BATH = 0$) during a given period. We then run the analysis for the two groups separately. The results in Panel A of Table 7 suggest that the positive association between weak FTR languages and goodwill impairments holds for companies without big bath incentives, as in columns (1) and (4), while it is marginally significant for firms with big bath incentives at the 10% level as in columns (2) and (5). The interaction models in columns (3) and (6) are negative and statistically significant at the 10% and 5% levels suggesting that the impact of big bath incentives on goodwill impairments is less pronounced in countries with weak FTR languages. As such, the tendency to report higher goodwill impairments for firms in countries

with weak FTR languages is not primarily driven by the presence of big bath reporting incentives.

The recognition of new additions of goodwill by firms active in mergers and acquisitions during the year may lead to significant goodwill impairments in the subsequent years as the additions will offset the current impairments (AbuGhazaleh *et al.*, 2011; Caplan *et al.*, 2018). We, therefore, performed an additional test controlling for such additions by including *GWA-NEW*, which is a dichotomous measure of additions to goodwill due to acquisitions during the financial year, in the analysis. We also included the interaction between *Weak-FTR* and *GWA-NEW* to disentangle the effect of overpayment for M&A from the effect of weak FTR languages on the reporting of goodwill impairments. Our results in column (1) and column (3) in Panel B of Table 7 show that the coefficient on *Weak-FTR* is essentially unchanged and remains statistically significant while the coefficient on the interaction term (*Weak-FTR*×*GWA-NEW*) in column (2) and column (4) is statistically insignificant. Thus, the effect of *Weak-FTR* on goodwill impairment is not affected by firms being acquisitive and paying acquisition premium when takeovers occur.[18]

We further controlled for the possible effect of cross-listing on the relation between *Weak-FTR* and goodwill impairment losses in Panel C of Table 7.[19] In column (1) and column (3), *Weak-FTR* is still positive and statistically significant while *Cross-listing*, a dummy variable taking one if a firm is cross-listed and zero otherwise, is insignificant. The coefficient of the interaction term, in column (2) and column (4), is negative but statistically insignificant.

[18]In an untabulated regression, we used an alternative measure for newly recognized goodwill, such as was used in Caplan *et al.* (2018). The new measure was calculated as goodwill at the end of the year plus goodwill impairment in the year minus goodwill at the beginning of the year. The results are essentially unchanged.

[19]Further, to control for international exposure, we repeated this analysis using a firm's level of international diversification (*Int-Div*), measured as a percentage of foreign sales to total sales (see Halabi *et al.*, 2021). In untabulated results, we found that the coefficient of *Weak-FTR* remains positive and significant while the interaction between *Weak-FTR* and *Int-Div* is negatively significant, indicating the impact of FTR on goodwill impairments is less pronounced for internationally diversified firms.

Overall, the results suggest that the positive relation between *Weak-FTR* and goodwill impairments remains robust to additional firm-level controls.

[Insert Table 7 near here]

5.2. Alternative samples

As around 60% of the observations are from a few countries, we excluded the observations from the largest countries within weak and strong FTR groups (Australia, France, Germany, and United Kingdom), and ran the regressions again. The findings on *Weak-FTR* in Column (1) and Column (2) of Table 8 are consistent with our main findings in Table 4. We also re-estimated the regressions after excluding both Belgium and Hong Kong.[20] This is because there are three official languages in Belgium: Dutch, French, and German (Kim *et al.*, 2017), and in Hong Kong both the Chinese language and English are used (Chen *et al.*, 2017). We find that *Weak-FTR* is positively associated with goodwill impairment losses in column (3) and column (4) of Table 8, confirming our initial findings that firms headquartered in countries with non-obligatory FTR report higher goodwill impairment losses.

[Insert Table 8 near here]

5.3. Alternative measures of FTR: Verb ratio and sentence ratio

As a validity test, Chen (2013) developed two continuous measures of FTR intensity: (a) the verb ratio, and (b) the sentence ratio. We used those two ratios developed by Chen (2013) multiplied by -1 so that the greater the value of verb ratio (sentence ratio), the weaker FTR language is. As such, we re-estimated the model after replacing *Weak-FTR* in our two equations with verb ratio and with sentence ratio. In column (1) and column (3) in Table 9, the coefficients on *Verb Ratio* are positively significant at the 5% and the 1% levels. Similarly, the

[20]In unreported regression, we repeated this analysis excluding South African firms and the results showed that the coefficient on *Weak-FTR* Language is positive and statistically significant.

coefficients on *Sentence Ratio* are positively significant at the 5% and the 1% levels in column (2) and column (4). These findings confirm our main results on the relation between weak-FTR and goodwill impairment losses.

[Insert Table 9 near here]

5.4. Alternative model specifications/estimations

To reduce endogeneity concerns arising from the historical relatedness of languages, we re-estimated the regressions after clustering the standard errors by language family (*Afro-Asiatic, Indo-European, Multi*[21]*, Sino-Tibetan, Uralic*), and we still find significantly positive coefficients on *Weak-FTR*, with the magnitudes remain unchanged[22] (see Column 1 and 2 in Panel A of Table 10). In Colum 3 and 4, we controlled for the geographical relatedness by including fixed effects for continent (*Africa, Asia, and Europe*) with robust standard errors clustered by language family, and the results remain unchanged. Additionally, we controlled for colonization by including Colony fixed effects (*Former British colony, Former French colony, Never colonized, Ottoman colony, and Swedish colony*) with robust standard errors clustered by language family. We find that the inclusion of colony fixed effects increases the measured effect of FTR on goodwill impairment (see Column 5 and 6 in Panel B of Table 9).[23]

In order to control for the historical non-independencies between languages (see Roberts *et al.*, 2015; Gotti *et al.*, 2021), we re-estimated the regressions with tobit and logistic

[21]"Multi" is not a language family; it is a label in the data to indicate that a specific country has multiple languages from different language families (see Gotti *et al.*, 2021). In our sample, South Africa is the only country that is considered "Multi". Our results remain unchanged irrespective of the inclusion or exclusion of South Africa. In further analysis (untabulated), we excluded South Africa from the analysis, and found that the coefficients on *Weak-FTR* were reduced somewhat but remained statistically significant at the 1%-level.

[22]Given that nearly all languages investigated in our sample are Indo-European languages, we repeated the above analysis by adjusting the standard errors for nine clusters (instead of five). These include the subfamilies of the Indo-European language family (*Balto-Slavic, Celtic, Germanic, Greek, Italic*) and the rest of language families in our study (*Afro-Asiatic, Multi, Sino-Tibetan, Uralic*). The results (untabulated) remain qualitatively unchanged.

[23]In an alternative specification, we re-estimated the regressions by adding fixed effects for language family to control for possible unobserved time-invariant heterogeneity across language families, and standard errors were clustered at the language family level to control for cross-sectional correlation in residuals across firms within each family. The coefficient on *Weak-FTR* remains significantly positive in untabulated results.

mixed effects models (which allow us to account for both within and between language family correlations), using random intercepts for language family, year and industry. We find that the results are robust and remain comparable in magnitudes (see Colum 1 and 2 in Panel B of Table 10). Prior research (see Gotti et al., 2021) also suggests that languages within the same geographical regions share similar features. we repeated this analysis by controlling for both historical and areal effects at the same time, using mixed effects modelling with random intercepts for language family, continent, year, and industry. The results, given in Column 3 and 4 in Panel B of Table 10, confirm the significant effect of FTR on goodwill impairment.

Although we included additional control variables to mitigate the omitted-variable bias, we also caried out propensity score matching analysis[24] to control for systematic differences between firms in countries that use weak FTR languages (the treated group) and those in countries that use strong FTR languages (the control group). Our matching approach minimized the absolute value of the difference between the propensity scores of the treated and control groups.

The propensity scores were estimated using logistic regression and include all firm-level covariates and year and industry to control for unobserved industry heterogeneity. We then ran regression analyses using the matched samples. Columns (1) and (2) in Panel C of Table 10 display the regression results for the matched samples obtained using the Tobit and logit model, respectively. The results showed that the size of the point estimate of *Weak-FTR* (0.33 and 0.39) was somewhat greater than previously reported in Table 4. In summary, our main finding is robust to a propensity score matching analysis that controls for observable

[24]According to Armstrong *et al.* (2010), "Propensity-score methods should be considered for future empirical accounting research . . . This will provide readers with the necessary information to assess the extent to which reported results are robust to correlated omitted variable and endogeneity concerns" (p. 261).

differences in firms' characteristics and industry heterogeneity among weak and strong FTR languages.

[Insert Table 10 near here]

6. Conclusion

This study examines the impact of the obligatory marking of future events across languages on firms' goodwill impairment by using a sample of 15,179 firm-year observations from 21 IFRS-adopting countries over the period 2005–2018. The obligatory marking of future events in these languages reduces the psychological importance of future, which leads speakers to discount future events (e.g., future impairment losses) because these appear temporally more distant and, hence, less imminent. More specifically, in this study, we consider whether differences in the obligatory marking of future events extends to firms' goodwill impairment.

After controlling for informal institutions (i.e., religiosity and culture), formal institutions (i.e., investor protection and legal right), and economic and reporting incentives, we find that firms located in countries that use weak FTR languages (e.g., German) are more likely to recognize goodwill impairment. In these countries, managers of firms perceive future events as more vivid and immediate because they do not disassociate the future from the present. For them, there is no sharp and salient difference between the negative effects of goodwill impairment on the present and on the future. However, managers of firms in countries that use strong FTR languages tend to delay goodwill impairment because they perceive that the negative impacts of goodwill impairment will be lower in the future.

Additional analyses showed that the higher levels of goodwill impairment reported by firms located in countries that use weak FTR languages are economically justified and not driven by big bath incentives. Furthermore, the results held on the application of alternative measures of FTR strength in languages, excluding countries where the majority of people speak more than one language (e.g., Belgium and Hong Kong), and including other country-level

controls (i.e., book-tax conformity and the strength of enforcement of accounting standards). The results also remain unchanged after removing firms from Australia, France, Germany, and the United Kingdom: countries that had the greatest number of observations with strong FTR and weak FTR languages.

Our study contributes to the literature because we used the linguistic hypothesis to explain corporate behaviors related to future oriented choices, namely, firms' choices in regard to goodwill impairment. To our knowledge, our study is the first to simultaneously analyze the effects of countries' formal and informal institutions on the reporting of goodwill impairment in cross-country settings by placing special emphasis on the grammatical structures of languages. This approach allowed us to build a link between institutional, cultural, religious, and linguistic factors, and cross-country variations in goodwill impairment reporting.

A limitation of the study is that the main variable of interest, the obligatory marking of future events, is binary, although we used two continuous measures of FTR intensity, verb ratio and sentence ratio, in the additional tests. In fact, referring to the future is more complex than the binary strong–weak future tense distinction. Furthermore, there is variation in the grammaticalization of future among speakers of the same language and between weak FTR languages (for an extensive discussion, see Jaggi *et al.*, 2022; Roberts *et al.*, 2015; Robertson & Roberts, 2020). Another limitation is that the classification of a country's language under weak and strong FTR is based on the main language spoken in that country. However, one may argue that multiple linguistic values should be assigned to many countries as there are several languages with different FTR strength spoken in some countries.

Future research could explore another characteristic of linguistic structures, such as grammatical gender marking (see Shoham, 2022), and its relationship with corporate behaviors, including goodwill impairment decisions. Another interesting direction for future

research is to advance the understanding of the impact of language characteristics on market reactions to goodwill impairment.

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Table 1
Sample description.

	Freq.	Percent
Panel A: Countries with strong-FTR languages		
Australia	1,150	7.58
France	2,206	14.53
Greece	177	1.17
Ireland	89	0.59
Israel	441	2.91
Italy	546	3.60
New Zealand	200	1.32
Poland	640	4.22
Portugal	152	1.00
South Africa	562	3.70
Spain	290	1.91
United Kingdom	2,080	13.70
Total	8,533	56.22
Panel B: Countries with weak-FTR languages		
Austria	319	2.10
Belgium	390	2.57
Denmark	484	3.19
Finland	613	4.04
Germany	2,486	16.38
Hong Kong	176	1.16
Netherlands	497	3.27
Norway	500	3.29
Sweden	1,181	7.78
Total	6,646	43.78
Panel C: Sample distribution by year		
2005	239	1.57
2006	578	3.81
2007	955	6.29
2008	1,087	7.16
2009	1,093	7.20
2010	1,126	7.42
2011	1,221	8.04
2012	1,084	7.14
2013	1,098	7.23
2014	1,234	8.00
2015	1,294	9.00
2016	1,336	8.80
2017	1,403	9.24
2018	1,431	9.43
Total	15,179	100

Table 2
Descriptive statistics.

Variables	N	Mean	Std. Dev.	Q1	Median	Q3
GWI	15,179	0.030	0.594	0	0	0
Weak-FTR	15,179	0.438	0.496	0	0	1
Religiosity	15,179	37.570	17.747	26.5	32	40.5
Individualism	15,179	71.343	12.999	67	71	79
Power Distance	15,179	42.143	16.397	33	35	57
Uncertainty Avoidance	15,179	60.219	21.995	35	65	86
Masculinity	15,179	48.959	21.597	43	61	66
Enforcement	15,179	5.336	0.565	4.986	5.378	5.784
Legal Right	15,179	7.009	1.680	5.909	6.909	8.545
Investor Protection	15,179	65.909	6.649	58.33	66.67	73.33
GDP Growth	15,179	1.653	2.241	1.082	1.970	2.679
GWA	15,179	0.200	0.195	0.048	0.138	0.296
MTB	15,179	2.490	2.795	1.04	1.72	2.88
ΔOCF	15,179	0.011	0.309	-0.050	0.008	0.070
ΔSales	15,179	0.067	0.253	-0.022	0.043	0.138
ΔROA	15,179	-0.003	0.111	-0.020	-0.000	0.017
BATH	15,179	-0.016	0.055	0	0	0
SMOOTH	15,179	0.022	0.078	0	0	0
LEV	15,179	0.536	0.185	0.416	0.546	0.669
Free Float	15,179	60.039	22.433	42.429	59.6	79.5
Analyst Following	15,179	103.011	121.443	14	50	153
Big 4	15,179	0.753	0.431	1	1	1
SIZE	15,179	13.295	2.031	11.871	13.152	14.683

This table presents descriptive statistics for the variables in the empirical model. See Appendix A for all variable definitions.

Table 3
Correlation Matrix.

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1. Weak-FTR	1																					
2. Religiosity	-0.3169*	1																				
3. Individualism	-0.2435*	-0.4238*	1																			
4. Power Distance	-0.4236*	0.2512*	-0.2098*	1																		
5. Uncertainty Avoidance	-0.2514*	0.4900*	-0.4596*	0.6474*	1																	
6. Masculinity	-0.3964*	0.5026*	0.1200*	0.0914*	0.2412*	1																
7. Enforcement	0.2016*	-0.4304*	0.1948*	-0.1719*	-0.4303*	-0.3821*	1															
8. Legal Right	-0.1716*	-0.3127*	0.4567*	-0.4006*	-0.5346*	0.2633*	0.3725*	1														
9. Investor Protection	-0.3631*	-0.2046*	0.1124*	-0.1255*	-0.4060*	-0.0787*	0.1817*	0.3506*	1													
10. GDP Growth	-0.0498*	0.0289*	0.0301*	-0.0802*	-0.0733*	0.0465*	0.0990*	0.2588*	0.0766*	1												
11. GWA	-0.0232*	-0.2127*	0.2323*	-0.0441*	-0.1903*	-0.0603*	0.1012*	0.1055*	0.0476*	0.0291*	1											
12. MTB	-0.0107	-0.0617*	0.0917*	-0.0866*	-0.1490*	0.0017	0.0553*	0.1015*	0.0728*	0.0712*	0.0300*	1										
13. ΔOCF	0.0061	0.0001	0.003	-0.0021	-0.0032	-0.0029	0.0025	0.0001	-0.0043	-0.0001	0.0226*	0.0456*	1									
14. ΔSales	-0.0167*	0.004	0.0229*	-0.0155	-0.0268*	0.0049	0.0342*	0.0400*	0.0179*	0.2167*	0.0899*	0.1398*	0.1338*	1								
15. ΔROA	0.006	-0.0033	0.0032	0.0002	0.0035	-0.0067	-0.0216*	-0.014	-0.0043	0.0371*	0.0125	0.0449*	0.1460*	0.0955*	1							
16. BATH	0.0237*	0.0426*	-0.0721*	0.0430*	0.0740*	-0.0249*	-0.0433*	-0.0974*	-0.0375*	0.0363*	-0.0063	-0.0045	0.2014*	0.1291*	0.6021*	1						
17. SMOOTH	-0.0197*	-0.0430*	0.0766*	-0.0428*	-0.0762*	0.0170*	0.0164*	0.0850*	0.0423*	0.0284*	0.0422*	0.1027*	0.1635*	0.0951*	0.6394*	0.0789*	1					
18. LEV	0.0361*	0.0576*	-0.1134*	0.0420*	0.1515*	-0.0638*	-0.0906*	-0.2431*	-0.0717*	-0.0826*	-0.0754*	0.1369*	-0.0089	0.0016	-0.0223*	0.0787*	-0.1007*	1				
19. Free Float	0.1096*	-0.1803*	0.2795*	-0.2364*	-0.3831*	-0.0587*	0.1910*	0.2171*	0.0576*	-0.0003	0.1528*	0.0934*	0.0018	-0.0208*	0.0053	-0.0407*	0.0378*	-0.0404*	1			
20. Analyst Following	0.1209*	-0.0908*	0.0310*	-0.0008	-0.0077	-0.0481*	-0.0224*	-0.1038*	-0.0889*	-0.0788*	0.0009	0.1134*	0.0095	-0.0422*	0.0163*	0.0856*	-0.0698*	0.1822*	0.3566*	1		
21. Big 4	0.0686*	-0.0690*	0.0253*	-0.1042*	-0.1633*	-0.2350*	0.1094*	-0.0358*	0.0832*	0.0013	-0.0262*	0.0512*	0.0118	-0.0241*	0.0198*	0.0647*	-0.0460*	0.1018*	0.1704*	0.2577*	1	
22.SIZE	0.0677*	0.0401*	-0.0959*	0.0530*	0.0963*	-0.0547*	-0.0474*	-0.1901*	-0.0547*	-0.0439*	-0.1195*	-0.0358*	-0.0054	-0.0536*	0.0217*	0.1696*	-0.1637*	0.3618*	0.1702*	0.7467*	0.3294*	1

This table presents the correlation coefficients between the variables in the empirical model. See Appendix A for all variable definitions.
* Denotes statistical significance at .05, for two-tailed tests.

Table 4
The effect of FTR in language on goodwill impairment amount and decision.

	(1)	(2)
Variables	Tobit model	Logit model
Weak-FTR	0.295**	0.358***
	(2.250)	(3.560)
Religiosity	0.010***	0.014***
	(2.716)	(4.777)
Individualism	0.006**	0.008**
	(1.992)	(2.501)
Power Distance	0.007**	0.007***
	(2.434)	(2.756)
Uncertainty Avoidance	-0.001	-0.001
	(-0.559)	(-0.252)
Masculinity	0.004*	0.005**
	(1.701)	(2.200)
Enforcement	0.239***	0.414***
	(2.848)	(6.399)
Legal Right	0.057**	0.056*
	(2.045)	(1.765)
Investor Protection	0.019***	0.030***
	(2.737)	(4.991)
GDP Growth	-0.001	-0.023
	(-0.097)	(-1.516)
GWA	0.827***	1.205***
	(3.248)	(9.615)
MTB	-0.044***	-0.064***
	(-2.604)	(-4.846)
ΔOCF	-0.082	-0.132
	(-1.004)	(-1.202)
ΔSALES	-0.187	-0.409***
	(-1.564)	(-3.137)
ΔROA	-1.135**	-1.519***
	(-2.519)	(-3.229)
BATH	-0.767	-0.644
	(-1.405)	(-0.879)
SMOOTH	1.224**	1.660***
	(2.355)	(3.194)
LEV	0.729**	1.132***
	(2.450)	(6.244)
Free Float	-0.004*	-0.003**
	(-1.891)	(-2.574)
Analyst Following	0.000	0.001*
	(1.303)	(1.758)
BIG 4	-0.026	-0.134**
	(-0.540)	(-1.999)
SIZE	0.106***	0.176***
	(3.026)	(7.269)
Intercept	-7.840***	-11.220***
	(-3.223)	(-13.507)
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Sample size	15,179	15,179
Pseudo R^2	0.0339	0.0661

All continuous variables are winsorized at the 1st and 99th percentiles. Coefficients are unbracketed, with heteroscedastic robust t and z statistics in parentheses (clustered by country and year). See Appendix A for all variable definitions.
***, **, * Indicate coefficients are statistically significant at $p \leq 0.01$, $p \leq 0.05$, and $p \leq 0.10$ (two-tailed tests).

Table 5
Weak FTR and abnormal goodwill impairments.

Variables	(1) Absolute value of abnormal goodwill impairments	(2) Positive abnormal goodwill impairments	(3) Negative abnormal goodwill impairments
Weak-FTR	-0.002***	-0.016***	1.57e-07***
	(-2.915)	(-3.741)	(2.710)
Religiosity	-4.34e-05*	-0.000***	-4.23e-09***
	(-1.909)	(-4.086)	(-4.139)
Individualism	1.04e-05	1.033e-4	-4.59e-09***
	(0.252)	(0.515)	(-4.258)
Power Distance	2.90e-05	-1.41e-05	-4.53e-09***
	(1.301)	(-0.130)	(-5.723)
Uncertainty Avoidance	-8.83e-05***	-0.000***	6.51e-09***
	(-3.927)	(-3.962)	(7.029)
Masculinity	4.19e-05**	0.000**	-9.07e-10
	(2.045)	(2.041)	(-1.090)
Enforcement	0.001*	0.002	2.31e-08
	(1.702)	(0.908)	(0.569)
Legal Right	1.335e-4	-0.001	-7.53e-08***
	(0.712)	(-0.926)	(-6.166)
Investor Protection	-6.75e-05	-0.001**	5.20e-09
	(-1.230)	(-2.135)	(1.118)
LEV	0.006**	-3.309e-4	-7.60e-07***
	(2.305)	(-0.027)	(-3.594)
Free Float	2.00e-05*	8.33e-05	2.78e-09***
	(1.776)	(1.353)	(4.420)
Analyst Following	6.59e-06***	4.69e-05***	-4.89e-09***
	(2.676)	(3.599)	(-9.868)
BIG 4	-1.4059e-3	5.83e-05	3.72e-07***
	(-0.614)	(0.015)	(9.585)
SIZE	-0.001***	-0.011***	5.75e-07***
	(-5.922)	(-8.129)	(11.658)
Intercept	0.019***	0.218***	-7.70e-06***
	(2.972)	(5.993)	(-11.086)
Industry fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Sample size	15,179	2,478	10,638
Adj R^2	0.019	0.147	0.197

All continuous variables are winsorized at the 1st and 99th percentiles. Coefficients are unbracketed, with heteroscedastic robust t and z statistics in parentheses (clustered by country and year). See Appendix A for all variable definitions.
***, **, * Indicate coefficients are statistically significant at $p \leq 0.01$, $p \leq 0.05$, and $p \leq 0.10$ (two-tailed tests).

Table 6
Weak FTR and unexpected goodwill impairments.

Variables	(1) Absolute value of unexpected goodwill impairments	(2) Positive unexpected goodwill impairments	(3) Negative unexpected goodwill impairments
Weak-FTR	-0.027***	-0.003	0.041***
	(-5.436)	(-0.584)	(4.483)
Religiosity	-0.001***	-0.000**	0.001***
	(-10.305)	(-2.124)	(7.093)
Individualism	0.000***	2.637e-4	-0.001***
	(2.823)	(1.022)	(-2.758)
Power Distance	0.001***	1.215e-4	-0.001***
	(5.732)	(0.859)	(-5.323)
Uncertainty Avoidance	-0.000***	-2.824e-4**	0.002***
	(-4.118)	(-2.349)	(7.656)
Masculinity	0.000**	1.808e-4	-0.000
	(2.287)	(1.506)	(-0.790)
Enforcement	-0.008**	-1.434e-4	0.007
	(-2.256)	(-0.047)	(1.174)
Legal Right	-0.005***	-0.002	0.006***
	(-4.466)	(-1.122)	(2.988)
Investor Protection	-0.001**	-3.54e-05	0.001**
	(-2.497)	(-0.149)	(2.389)
LEV	-0.029***	-0.007	0.080***
	(-3.449)	(-0.451)	(5.378)
Free Float	4.42e-4***	1.645e-4**	-0.001***
	(6.973)	(2.369)	(-5.123)
Analyst Following	-1.366e-4***	4.32e-05***	-7.12e-5**
	(-9.557)	(3.002)	(-2.435)
BIG 4	-0.018***	-0.002	0.017***
	(-5.139)	(-0.507)	(3.261)
SIZE	-0.002*	-0.011***	0.012***
	(-1.879)	(-5.878)	(5.594)
Intercept	0.239***	0.176***	-0.683***
	(5.703)	(3.843)	(-8.703)
Industry fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Sample size	15,179	1,366	6,118
Adj R^2	0.093	0.132	0.177

All continuous variables are winsorized at the 1st and 99th percentiles. Coefficients are unbracketed, with heteroscedastic robust t and z statistics in parentheses (clustered by country and year). See Appendix A for all variable definitions.
***, **, * Indicate coefficients are statistically significant at $p \leq 0.01$, $p \leq 0.05$, and $p \leq 0.10$ (two-tailed tests).

Table 7
Additional firm level controls

Panel A: Controlling for big bath incentives.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	Tobit model			Logit model		
	Bath = 0	Bath < 0	Interaction	Bath = 0	Bath < 0	Interaction
Weak-FTR	0.338**	0.150*	0.273**	0.386***	0.425*	0.327***
	(2.203)	(1.678)	(2.116)	(3.782)	(1.934)	(3.245)
BATH			-1.104**			-1.054*
			(-1.965)			(-1.660)
Weak-FTR × BATH			-1.125*			-1.632**
			(-1.748)			(-2.031)
Country-level controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Sample size	12,951	2,228	15,179	12,951	2,228	15,179
Pseudo R^2	0.032	0.071	0.034	0.065	0.093	0.066

Panel B: Controlling for newly recognized goodwill.

Variables	(1)	(2)	(3)	(4)
	Tobit model		Logit model	
	GWA-NEW	Weak-FTR×GWA-NEW	GWA-NEW	Weak-FTR×GWA-NEW
Weak-FTR	0.294**	0.303**	0.358***	0.383***
	(2.252)	(2.310)	(3.565)	(3.450)
GWA-NEW	0.042	0.050	-0.031	-0.010
	(0.927)	(0.881)	(-0.618)	(-0.146)
Weak-FTR×GWA-NEW		-0.018		-0.048
		(-0.243)		(-0.521)
Country-level controls	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Sample size	15,179	15,179	15,179	15,179
Pseudo R^2	0.034	0.034	0.066	0.066

Panel C: Cross listing and the effect of FTR on goodwill impairment amounts and decision.

Variables	(1)	(2)	(3)	(4)
	Tobit model		Logit model	
	Cross-listing	Weak-FTR× Cross-listing	Cross-listing	Weak-FTR× Cross-listing
Weak-FTR	0.292**	0.303**	0.356***	0.396***
	(2.255)	(2.085)	(3.554)	(2.895)
Cross Listing	0.100	0.104	0.067	0.082
	(1.489)	(1.370)	(1.000)	(1.012)
Weak-FTR× Cross-listing		-0.013		-0.049
		(-0.121)		(-0.357)
Country-level controls	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Sample size	15,179	15,179	15,179	15,179
Pseudo R^2	0.034	0.034	0.066	0.066

All continuous variables are winsorized at the 1st and 99th percentiles. Coefficients are unbracketed, with heteroscedastic robust t and z statistics in parentheses (clustered by country and year). See Appendix A for all variable definitions.
***, **, * Indicate coefficients are statistically significant at $p \leq 0.01$, $p \leq 0.05$, and $p \leq 0.10$ (two-tailed tests).

Table 8
Alternative samples.

Variables	(1)	(2)	(3)	(4)
	Excluding largest weak FTR and strong FTR		Excluding Belgian and Hong Kong firms	
	Tobit model	Logit model	Tobit model	Logit model
Weak-FTR	0.747**	1.226***	0.443**	0.556***
	(2.284)	(7.596)	(2.316)	(4.304)
Country-level controls	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Sample size	6,076	6,076	14,613	14,613
Pseudo R^2	0.053	0.097	0.035	0.064

All continuous variables are winsorized at the 1st and 99th percentiles. Coefficients are unbracketed, with heteroscedastic robust t and z statistics in parentheses (clustered by country and year). See Appendix A for all variable definitions.
***, **, * Indicate coefficients are statistically significant at $p \leq 0.01$, $p \leq 0.05$, and $p \leq 0.10$ (two-tailed tests).

Table 9
Alternative measures of FTR in languages.

Variables	(1)	(2)	(3)	(4)
	Tobit ratio		Logit ratio	
	Verb ratio	Sentence ratio	Verb ratio	Sentence ratio
Verb Ratio	0.003**		0.003***	
	(2.252)		(3.712)	
Sentence Ratio		0.003**		0.003***
		(2.262)		(3.800)
Country-level controls	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Sample size	15,179	15,179	15,179	15,179
Pseudo R^2	0.034	0.034	0.066	0.066

All continuous variables are winsorized at the 1st and 99th percentiles. Coefficients are unbracketed, with heteroscedastic robust t and z statistics in parentheses (clustered by country and year). See Appendix A for all variable definitions.
***, **, * Indicate coefficients are statistically significant at $p \leq 0.01$, $p \leq 0.05$, and $p \leq 0.10$ (two-tailed tests).

Table 10
Alternative model specifications/estimations

Panel A: Controlling for language evolution.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	Language family clustered se					
	Without controls for continent or colony fe		Continent fixed effects		Colony fixed effects	
	Tobit model	Logit model	Tobit model	Logit model	Tobit model	Logit model
Weak-FTR	0.295***	0.358***	0.252**	0.285***	0.432***	0.566***
	(10.056)	(3.815)	(11.107)	(5.468)	(8.892)	(3.880)
Country-level controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Continent fixed effects	No	No	Yes	Yes	No	No
Colony fixed effects	No	No	No	No	Yes	Yes
Sample size	15,179	15,179	15,179	15,179	15,179	15,179
Pseudo R^2	0.034	0.066	0.035	0.069	0.035	0.068

Panel B: Mixed effect modelling.

Variables	(1)	(2)	(3)	(4)
	Language family random effect		Language family and continent random effects	
	Tobit model	Logit model	Tobit model	Logit model
Weak-FTR	0.298***	0.282***	0.327***	0.371***
	(3.642)	(2.782)	(3.796)	(3.533)
Country-level controls	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes
Language family random effects	Yes	Yes	Yes	Yes
Industry random effects	Yes	Yes	Yes	Yes
Year random effects	Yes	Yes	Yes	Yes
Continent random effects	No	No	Yes	Yes
Sample size	15,179	15,179	15,179	15,179

Panel C: Propensity score matching

Variables	(1)	(2)
	Tobit model	Logit model
Weak-FTR	0.330**	0.390***
	(2.268)	(3.844)
Country-level controls	Yes	Yes
Firm-level controls	Yes	Yes
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Sample size	13,292	13,292
Pseudo R^2	0.035	0.071

All continuous variables are winsorized at the 1st and 99th percentiles. Coefficients are unbracketed, with heteroscedastic robust t and z statistics in parentheses (clustered by country and year). See Appendix A for all variable definitions. ***, **, * Indicate coefficients are statistically significant at $p \leq 0.01$, $p \leq 0.05$, and $p \leq 0.10$ (two-tailed tests).

Appendix A

Variable definitions

Dependent variables	
GWI	Firms' reported goodwill-impairment losses divided by the amount of goodwill at the end of the year t-1.
IMP	A dichotomous variable that is equal to one if the firm recorded a goodwill impairment loss, and zero otherwise.
Country-level variables	
Weak-FTR	A dichotomous variable that is equal to one if a language does not differentiate the present and the future obligatorily, and zero otherwise. Source: Chen (2013).
Religiosity	The WIN-Gallup International 'Religiosity and Atheism Index' measures global self-perceptions on beliefs is based on interviews with more than 50,000 men and women selected from 57 countries across the globe in five continents.
Individualism	Hofstede's individualism scores. Source: The Hofstede centre (geert-hofstede.com)
Power Distance	Hofstede's power distance scores. Source: The Hofstede centre (geert-hofstede.com)
Uncertainty Avoidance	Hofstede's uncertainty avoidance scores. Source: The Hofstede centre (geert-hofstede.com)
Masculinity	Hofstede's masculinity scores. Source: The Hofstede centre (geert-hofstede.com)
Enforcement	This index measures the effectiveness of a country's regulation and supervision of securities markets. Source: World Bank/World Economic Forum.
Legal Right	This index measures the degree to which collateral and bankruptcy laws protect borrowers' and lenders' rights and thus facilitate lending. Source: World Bank/Doing Business.
Investor Protection	This variable is a combination of the Extent of disclosure index (transparency of transactions), the Extent of director liability index liability for self-dealing), and the Ease of shareholder suit index (shareholders' ability to sue officers and directors for misconduct). Source: World Bank/Doing Business.
GDP Growth	Percent change in Gross Domestic Product from t to t-1. Source: World Bank
Firm-level variables	
GWA	Firms' opening balance of goodwill divided by total assets at the end of t-1.
MTB	Firms' book value of equity (adjusted for goodwill impairments) divided by book value of equity at the end of t.
ΔOCF	Change in operating cash flow from t to t-1 divided by total assets at the end of t-1.
ΔSALES	Change in sales from t to t-1divided by total assets at the end of t-1.
ΔROA	Change in return on assets from t to t-1.
BATH	This variable is equal to the change in firm's pre-write off earnings from period t to t-1, divided by total assets at the end of t-1, when this change is below the median of non-zero negative values, and 0 otherwise
SMOOTH	The variable is equal the change in firm i's pre-write-off earnings from t to t-1 divided by total assets at the end of t- 1, when this change is above the median of non-zero positive values, and 0 otherwise
LEV	Firm's long-term debt-to-assets ratio
Free Float	The percentage of the firm's shares that are freely available for trading in the market.
Analyst Following	The average number of analysts following the firm.
BIG 4	A dummy variable that takes the value 1 if firm's auditor is one of the BIG 4 Auditors (i.e., Deloitte, PwC; EY; and KPMG) and 0 otherwise.
SIZE	The natural logarithm of total assets at the end of t-1.
Additional variables	
Verb Ratio	The number of verbs that are grammatically future marked, divided by the total number of verbs in online texts of weather forecasts.
Sentence Ratio	The number of sentences that are grammatically future marked, divided by the total number of sentences in online texts of weather forecasts.
GWA-NEW	A dichotomous variable equal to 1 if the firm has additions to its goodwill due to acquisitions during the financial year, and 0 otherwise.
Cross-listing	A dummy variable which equals one if the firm is cross listed on more than one stock exchange, and zero otherwise. Source: Osiris Database.
Language evolution variables	
Language Families	Language family to which a language belongs. Source : https://github.com/seannyD/FTRAccountingStudy
Colonization	Colonial groups. Source : Klerman et al. (2011).
Additional variables used in untabulated analyses	
International Diversification	The percentage of the firm's foreign sales to total sales.
Crisis	A time dummy variable, which is one during the years 2008 to 2009, and zero otherwise.
Enforcement Index	A summary measure of a country's overall regulatory environment and is calculated as a simple average of six dimensions of the Worldwide Governance Indicators: Voice and Accountability, Political Stability and Absence of Violence, Government Effectiveness, Regulatory Quality, Rule of Law and Control of Corruption. Source: World Bank.
Standards Enforcement	Index for strength of public enforcement of financial reporting and auditing. Source: Brown et al. (2014).
Book tax conformity	The amount of variation in current tax expense that are explained by the variation in pre-tax earnings, income from foreign operations, and dividends (i.e., higher values indicate higher book-tax conformity). Source:(Blaylock et al. 2015).