



Languages and corporate savings behavior[☆]



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ABSTRACT

Speakers of strong future time reference (FTR) languages (e.g., English) are required to grammatically distinguish between future and present events, while speakers of weak-FTR languages (e.g., Chinese) are not. We hypothesize that speaking about the future in the present tense may result in the belief that adverse credit events are more imminent. Consistent with such a linguistic hypothesis, weak-FTR language firms are found to have higher precautionary cash holdings. We report additional supportive results from changes in the relative importance of different languages in a country's business domain, evidence from within one country with several distinct languages, and results related to changes following a severe financial crisis. Our evidence introduces a new explanation for heterogeneity in corporate savings behavior, provides insights about belief formation in firms, and adds to research on the effects of languages on economic outcomes.

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The diversity of languages is not a diversity of signs and sounds but a diversity of views of the world. —Wilhelm von Humboldt, "On the Comparative Study of Languages," 1820.

1. Introduction

The notion that languages may influence decision-making has a long history in social science (e.g., Campbell, 2003). In particular, the *linguistic relativity hypothesis*, also referred to as the Sapir-Whorf hypothesis, posits that the structure of a

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language may shape its speakers' representations of reality (e.g., Whorf et al., 1956). As a concrete example, it has been well-established in linguistics research that languages have different ways of grammatically referencing the future (e.g., Dahl, 1985). For example, an English speaker repeatedly changes the structure of a sentence when referencing a future, as opposed to a present, event (e.g., "It will be ..." as opposed to "It is ..."). In contrast, a Chinese speaker may use the present tense when referencing a future event.¹ Do such differences across languages affect the ways individuals view the world, form beliefs, and in the end make corporate decisions?²

It has recently been shown that heterogeneity in languages explains the variation in individual savings behavior (e.g., Chen, 2013 and Sutter et al., 2015). A follow-up question is whether these language effects also carry over to behaviors in the corporate domain. In this paper, we focus on one aspect of corporate financial decision-making, namely the propensity of firms to hold cash. Countries have different savings cultures (e.g., Carroll et al., 1994, 1999), which may be reflected in the behaviors of individuals as well as corporations. In fact, a precautionary motive for savings has been proposed for individuals (e.g., Kimball, 1990 and Hubbard et al., 1995) as well as for corporations (e.g., Keynes, 1934), with supporting evidence in economics and finance (e.g., Lusardi, 1998 and Opler et al., 1999). Indeed, Fig. 1 shows a strong positive correlation ($\rho = 0.47$) between individual and corporate savings propensities for the largest countries in the world, suggesting that some of the factors affecting individual behavior may also impact corporations. This positive correlation is intriguing and we believe that this is the first time that it has been documented. In this paper, we examine whether differences in corporate savings behavior may partly be attributable to language heterogeneity.

We report a collage of evidence that supports the linguistic hypothesis, starting with a large-sample empirical approach. Language heterogeneity is found to explain variation in corporate savings behavior: Firms in weak future time reference (FTR) language countries (i.e., countries where speakers may reference a future event with the present tense, e.g., China) are found to have substantially higher average cash holdings. This evidence dovetails well with previous evidence in economics on the savings behavior of individuals (e.g., Chen, 2013). The estimated effect is statistically significant, economically sizable, and does not attenuate after we control for differences in industry composition or include an extensive set of firm- and country-level controls that have previously been found to explain variations in cash holdings. Importantly, we find that the language effect is not simply absorbing legal origin, colonization, or alternative culture effects.

We also report results from several other empirical approaches. First, analyzing difference-in-differences, we find that Hong Kong based companies, compared to several control groups, have increased their cash holdings as the Chinese language has increased in importance in the business domain after the 1997 handover (i.e., the transfer of sovereignty over Hong Kong from the U.K. to China). Second, within Switzerland, firms in weak-FTR language regions are found to have higher cash holdings compared to those in strong-FTR language regions. Finally, we find that weak-FTR language firms' cash holdings increased relatively more after the 2008 financial crisis, suggesting that differences in beliefs about the time distance to another adverse credit event is one possible mechanism through which language affects variation in cash holdings.

Our study contributes to several research disciplines. First, we introduce language heterogeneity as a novel explanation for variations in corporate financial decision-making. The scientific basis for our linguistic hypothesis is pre-existing evidence in the intersection of economics, linguistics, and psychology (e.g., Aronoff and Rees-Miller, 2003). We show that language explains not only savings behavior at the level of individuals (e.g., Chen, 2013 and Sutter et al., 2015), but also corporate savings propensities. Our results contribute to recently emerging evidence on the effect of languages on corporate decision-making (e.g., Brannen et al., 2014 and Kim et al., 2017).

Second, explaining differences in corporate cash holdings has resulted in several studies in international corporate finance (e.g., Dittmar et al., 2003, Kalcheva and Lins, 2007, and Pinkowitz et al., 2016).³ We contribute a new perspective by suggesting that heterogeneous beliefs, based on language structure differences, may explain why some firms exhibit a higher propensity of holding cash. That is, language may explain variation in the precautionary savings motive for cash across firms around the world.

The rest of the paper is organized as follows. Section 2 reviews related research and develops our linguistic hypothesis. Section 3 describes the construction of our data set. Section 4 reports our empirical evidence and several robustness checks. Section 5 reports further evidence and extensions. Finally, Section 6 concludes.

2. Related research

2.1. Linguistic relativity hypothesis

The Sapir-Whorf hypothesis (SWH) posits that the structure of a language systematically affects its speakers' representations of reality (e.g., Whorf et al., 1956 and Boroditsky, 2003). In spite of the possibility of translating from one language to another,

¹ Anecdotal evidence from *Chinglish*, i.e., English that is influenced by the Chinese language, emphasizes these differences in that Chinglish speakers often ignore verb conjugation and tense.

² Evolutionary linguists explain the origins of languages and heterogeneity across different languages based on environmental constraints related to, e.g., the division of labor and reproduction in ancient agro-societies (e.g., Johansson, 2005). Characteristics of languages, e.g., the ways of grammatically referencing the future, have remained stable over thousands of years. That is, language structure may be expected to be exogenous to current economic outcomes (e.g., Tabellini, 2008), reducing endogeneity concerns in an empirical analysis of a linguistic hypothesis.

³ For a more comprehensive review of research related to corporate cash holdings, we refer to Almeida et al. (2014).

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