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From words to finances: Unraveling the negative net debt-languages nexus

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ABSTRACT

Using an international dataset, we find that firms in countries with languages that lack a clear distinction between present and future tenses, leading to weaker future time references, are more likely to adopt negative net debt. This conservative and non-standard financing policy is notably pronounced among financially constrained firms, those with weaker governance, and those operating in highly competitive industries. Interestingly, this increase in negative net debt with weak-FTR is higher in countries with more established institutions, financial systems, and legal frameworks, which typically exhibit a lower prevalence of financial conservatism and a weaker influence of informal institutions on corporate decisions.

1. Introduction

There is increasing interest in exploring the impact of the Sapir–Whorf hypothesis, which posits that language shapes thoughts and perceptions of decision-makers. Recent studies link the strength of future time references (FTR-strength) in languages with various corporate outcomes, such as savings (Chen, 2013), innovation (Kong et al., 2022), investment efficiency (Kim et al., 2020), tax avoidance (Na and Yan, 2022), corporate social responsibility and research and development (Liang et al., 2018; Chi et al., 2020), earnings management (Kim et al., 2017), risk-taking (Osei-Tutu and Weill, 2021), and dividend payments (He and Zhang, 2022; Nishikawa et al., 2023). Despite these findings, no prior study has explored the role of FTR-strength in languages in the context of negative net debt–a financial structure where a company's cash holdings exceed its total debt. This dearth of research is significant given the prevalence of NND policy and its potential impact on the efficiency of capital allocation.

According to research on time encoding in languages, speakers of strong-FTR languages (e.g. English, French, and Russian), which require grammatical distinctions between the future and present, are typically short-term-oriented (see Dahl, 2008; Chen, 2013; Hechavarría et al., 2023) and exhibit a higher appetite for risk-taking (Osei-Tutu and Weill, 2021). In contrast, speakers of weak-FTR languages (e.g. Mandarin, German, and Japanese), which do not require such distinctions, are more future-oriented and tend to have a reduced appetite for risk-taking (Chen, 2013; Machokoto et al., 2023).

The related but still developing literature suggests that unorthodox corporate financing policies, such as Negative Net Debt (NND) and low Net Debt to Total Assets (ND/TA), may be attributed to conservative policies employed to maintain financial flexibility or preserve debt capacity for future needs (Cuong et al., 2021; Cui, 2020). Lambrecht and Pawlina (2013) also demonstrate that

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managers' level of risk aversion is a driver of NND policy adoption by firms. Thus, we propose that firms in countries with weak-FTR languages are more likely to adopt NND and low debt financing policies.

In this study, we analyze data from 45,560 firms drawn from 52 countries, covering the period 1981 to 2019, to test the hypothesis that speakers of weak-FTR languages tend to be more future-oriented and less willing to take risks. We find evidence supporting this conjecture, as FTR-strength is inversely correlated with the NND policy. Specifically, firms in countries with weak-FTR languages are more likely to adopt NND than those in strong-FTR countries. Our results show that firms in weak-FTR countries are 22% to 36% more likely to adopt NND financing than those in strong-FTR countries. These findings are robust to several concerns. Additionally, we find that the association between FTR-strength and the NND financing policy is more pronounced in financially constrained firms, firms with weak governance, and firms operating in highly competitive industries. Surprisingly, we also find that the association is more pronounced in countries with more developed institutions and those with legal origins rooted in common law.

This study makes three contributions to the literature. First, it extends the limited literature on the NND and low net debt puzzle by investigating the relationship between the FTR-strength of languages and the prevalence of the NND and low net debt phenomenon. To our knowledge, no prior study has explored this connection. Thus, our study introduces a novel determinant of NND and low net debt in to the academic discourse. Second, our study adds to the ongoing debate on the influence of the FTR-strength of languages on corporate decisions by examining its unique role in driving the increasing prevalence of NND and low net debt policies. Third, our investigation reveals the complex interplay between the FTR-strength of languages, a form of informal institution, and the adoption of NND and low net debt policies by firms operating under varying levels of development of formal institutions. Therefore, our findings highlight the role of the interactions between formal and informal institutions in shaping corporate decisions. The following sections discuss the models, data, findings, and conclusions of the study.

2. Data and methodology

We sourced firm-level data from the Thompson Reuters Datastream. Datasets for macroeconomic and institutional variables were drawn from the World Bank and several previous studies (see Kunčič, 2014; Hofstede, 2001; Djankov et al., 2008; Chen, 2013). As in prior studies, we exclude firms in the regulated utility and financial sectors and firms with missing observations.[1] In addition, to reduce the influence of extreme observations, we exclude firms with more than 100% growth in assets/sales and winsorize all continuous firm-level variables at the distribution's upper and lower one percentiles. Our final sample comprised 45,560 firms, representing 613,784 firm-year observations from 52 countries between 1981 and 2019.

To examine the impact of FTR-strength on NND and low net debt policies, we estimate the following model:-

$$y_{ijkt} = \gamma_0 + \gamma_1 weak\text{-}FTR_k + \boldsymbol{\theta} \boldsymbol{X}_{ijkt-1} + \eta_j + \eta_t + \xi_{ijkt} \quad (1)$$

where i, j, k and t are the indices for firms, industries, countries, and years, respectively. y represents either NND, a dummy variable that equals one if a firm has a negative net debt (cash is greater than total debt) and zero otherwise, or net debt (difference between total debt and cash and cash equivalent to total assets).[2] γ_0 is constant. γ_1 and $\boldsymbol{\theta}$ are coefficients to be estimated. $weak\text{-}FTR$ is a dummy variable that equals one if a firm is domiciled in a *weak-FTR* country and zero otherwise. $\boldsymbol{X}$ is a vector of lagged control variables, namely, Tobin's q, sales growth, return on assets (*ROA*), firm-size, property, plant and equipment (*PPE*), depreciation (*DEP*), research and development (*R&D*), legal institutions, political institutions, economic institutions, power distance, masculinity, uncertainty avoidance, Catholicism, GDP growth and inflation. η_j, η_k and η_t denote industry and year fixed effects, respectively, while ξ_{ijkt} denotes the error term. Since our main country-level independent variable, *weak-FTR*, is time-invariant, we have omitted country-fixed effects. However, to mitigate omitted variable bias, we include firm- and country-level control variables, along with industry and year fixed effects, in our models. All variables used in the study are defined in Table 1.

3. Empirical results

Table 2 presents the summary statistics, showing that, on average, 36% of firms have NND. As expected, these findings show that NND firms are more prevalent in weak-FTR countries (40%), which is approximately 28% higher than the proportion of NND firms in strong FTR countries (31%). The average net debt stands at 7.45% overall; however, it is approximately 100% higher for firms in strong-FTR countries (10.05%) than for those in weak-FTR countries (5.02%). Additionally, we observe that these differences between weak-FTR and strong-FTR countries are consistent across the other four alternative proxies of NND (NNDLDA, NND0, NND1, NND5, and NND10), providing preliminary support to our hypothesis.[3] The pairwise correlations presented in Table A.1 in the Online Appendix are as expected and are not too high to indicate multicollinearity issues.[4]

In Table 3, we tabulate the results of estimating several variations of Eq. (1). Columns (1) and (7) present the results of the univariate regressions that exclude control variables. Columns (2) to (6) and (8) to (12) present models wherein we progressively add control variables to address the omitted variable bias. We observe that the coefficient of weak-FTR on NND is positively significant

[1] See, Machokoto et al. (2020), Chipeta et al. (2021) and Machokoto et al. (2021).

[2] For robustness, we use several other proxies for negative net debt, namely, NPNDLDA, NPND0, NPND1, NPND5, and NPND10.

[3] Figure A.1 in the Online Appendix shows similar variations between weak-FTR and strong-FTR countries in the net debt (ND/TA) and the measures of negative net debt (NND, NNDLDA, NND0, NND1, NND5, and NND10).

[4] The sample distribution across countries is presented in Table A.2 in the Online Appendix.

Table 1
Variable definitions.

Variables	Definitions
NND	A dummy variable equals one if a firm has negative net total debt (cash and cash equivalent is greater than total debt) and zero otherwise.
ND/TA	Net total debt is calculated as the difference between total debt and cash and cash equivalent.
NNDLDA	A dummy variable equals one if a firm has negative net long-term debt (cash and cash equivalent is greater than long-term debt) and zero otherwise.
NND0	A dummy variable equals one if a firm has negative net debt excluding firms with zero debt (firms with total debt equals zero) and zero otherwise.
NND1	A dummy variable equals one if a firm has negative net debt excluding firms with almost zero total debt (firms with less than 1% total debt) and zero otherwise.
NND5	A dummy variable equals one if a firm has negative net debt excluding firms with zero debt (firms with less than 5% total debt) and zero otherwise.
NND10	A dummy variable equals one if a firm has negative net debt excluding firms with zero debt (firms with less than 10% total debt) and zero otherwise.
weak-FTR	The dummy variable that equals one for countries with Weak Future Time Reference (FTR) and zero otherwise (see Chen et al., 2017).
Verb Ratio	The number of verbs that indicate future tense and divide it by the total number of verbs that refer to the future (see Chen et al., 2017).
Sentence Ratio	The percentage of sentences discussing the future that contain a grammatical marker indicating future tense (see Chen et al., 2017).
Tobin's q	Market value of equity plus debt to total assets.
Sales growth	The change in total sales.
ROA	Return on total assets.
Size	The logarithm of total assets.
PPE	Property, plant and equipment to total assets.
DEP	Depreciation to total assets.
R&D	Research and development to total assets.
HP Index	$-0.737 \times Size + 0.043 \times Size^2 - 0.040 * Age$. The HP Index is based on Hadlock and Pierce (2010).
Z-Score	$1.2 \times (Working\ Capital/Total\ Assets) + 1.4 \times (Retained\ Earnings/Total\ Assets)$ $+3.3 \times (Earnings\ Before\ Interest\ \&\ Tax/Total\ Assets) + 1.0 \times (Sales/Total\ Assets)$ $+0.6 \times (Market\ Value\ of\ Equity/Total\ Liabilities)$ (see Altman, 1968).
Governance	The score of the quality of a company's governance practices and structures from ASSET4 Datastream.
Management quality	A quantitative measure/score assessing the quality of a company's management practices from ASSET4 Datastream.
HHI index	The Herfindahl–Hirschman Index (HHI) is a measure of market concentration calculated by summing the squares of the market shares of all firms in a given market.
CR4 index	The top four concentration index (CR4) is a measure of market concentration that quantifies the combined market share of the four largest firms operating within a specific market.
Legal institutions	A composite index of the quality of a country's legal institutions based on (see Kunčič, 2014). This dataset is available from https://sites.google.com/site/aljazkuncic/.
Political institutions	A composite index of the quality of a country's political institutions based on (see Kunčič, 2014). This dataset is available from https://sites.google.com/site/aljazkuncic/.
Economic institutions	A composite index of the quality of a country's economic institutions based on (see Kunčič, 2014). This dataset is available from https://sites.google.com/site/aljazkuncic/.
Power distance	Hofstede's cultural dimension for power distance (see Hofstede, 2001).
Masculinity	Hofstede's cultural dimension for masculinity (see Hofstede, 2001).
Uncertainty avoidance	Hofstede's cultural dimension for uncertainty avoidance (see Hofstede, 2001).
Catholicism	A dummy variable that takes the value of one if a country has more than 50% of the population surveyed as Catholics and zero otherwise.
GDP growth	The growth rate of real GDP.
Inflation	The inflation rate based on the consumer price index (CPI).

The table lists the definitions of all variables used. All firm-level variables are drawn from *Thomson Reuters Datastream*. Data for institutional quality, religion and macroeconomic conditions is drawn from the World Bank (WBC) and academic articles such as Djankov et al. (2003, 2008), La Porta et al. (1997) and Kunčič (2014). Cultural dimensions are based on Hofstede (2001). The FTR-strength of languages is drawn from Chen et al. (2017).

(at the 1% level) in all models presented in Table 3. Regarding economic significance, the estimate indicates that relative to firms in strong-FTR countries, those in weak-FTR countries are 22% to 36% more likely to adopt an NND policy. Similarly, we find that the coefficient of weak-FTR on net debt is negatively significant (at the 1% level), suggesting that, on average, firms in weak-FTR countries have between 6% to 7% less net debt than their counterparts in strong-FTR countries. These findings support the notion that speakers of weak FTR languages are more inclined to be future-oriented and have a lower appetite for taking risks (i.e., bankruptcy associated with debt financing) and, thus, are likely to adopt the conservative, unorthodox policies of NND and low net debt.

Table 2
Descriptive statistics.

#	Variables	Full sample		Strong FTR		weak-FTR		Differences
		Mean	Std.Dev	Mean	Std.Dev	Mean	Std.Dev	Mean
(1)	NND	0.3589	0.4797	0.3141	0.4642	0.4005	0.4900	−0.0864***
(2)	ND/TA	0.0745	0.2578	0.1005	0.2570	0.0502	0.2562	0.0503***
(3)	NNDLDA	0.5275	0.4992	0.4469	0.4972	0.6024	0.4894	−0.1555***
(4)	NND0	0.2773	0.4477	0.2259	0.4182	0.3251	0.4684	−0.0992***
(5)	NND1	0.2303	0.4210	0.1789	0.3833	0.2780	0.4480	−0.0991***
(6)	NND5	0.0908	0.2874	0.0627	0.2424	0.1170	0.3214	−0.0543***
(7)	NND10	0.1550	0.3619	0.1132	0.3168	0.1939	0.3954	−0.0808***
(8)	weak-FTR	0.5183	0.4997	0.0000	0.0000	1.0000	0.0000	−1.0000***
(9)	Verb Ratio	0.0307	0.0395	0.0624	0.0355	0.0009	0.0028	0.0615***
(10)	Sentence Ratio	0.0307	0.0395	0.0625	0.0355	0.0009	0.0028	0.0615***
(11)	Tobin's *q*	1.5003	1.0897	1.5248	1.0852	1.4775	1.0934	0.0473***
(12)	Sales growth	0.0732	0.1807	0.0835	0.1836	0.0637	0.1774	0.0198***
(13)	ROA	0.0631	0.0880	0.0717	0.0969	0.0552	0.0779	0.0165***
(14)	Size	14.8217	2.9166	14.0381	2.9028	15.5501	2.7350	−1.5120***
(15)	PPE	0.3181	0.2127	0.3351	0.2293	0.3023	0.1947	0.0329***
(16)	DEP	0.0403	0.0296	0.0440	0.0306	0.0367	0.0282	0.0073***
(17)	R&D	0.0136	0.0344	0.0143	0.0392	0.0129	0.0293	0.0014***
(18)	Legal institutions	0.7668	0.1564	0.7572	0.1527	0.7757	0.1593	−0.0185***
(19)	Political institutions	0.7221	0.1543	0.7225	0.1338	0.7217	0.1711	0.0008**
(20)	Economic institutions	0.7112	0.1315	0.7120	0.1287	0.7105	0.1340	0.0015***
(21)	Power distance	0.0544	0.0185	0.0522	0.0160	0.0564	0.0203	−0.0042***
(22)	Masculinity	0.0578	0.0216	0.0542	0.0118	0.0611	0.0274	−0.0069***
(23)	Uncertainty avoidance	0.0599	0.0246	0.0622	0.0211	0.0578	0.0273	0.0044***
(24)	Catholicism	0.2116	0.4084	0.3070	0.4613	0.1229	0.3283	0.1841***
(25)	GDP growth	0.0324	0.0315	0.0294	0.0256	0.0351	0.0360	−0.0058***
(26)	Inflation	0.0287	0.1285	0.0361	0.0455	0.0219	0.1727	0.0141***
	Observations	613,784		295,656		318,128		
	Firms	45,560		23,239		22,321		

This table presents the descriptive statistics. All variables used are defined in Table 1. ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively.

4. Additional analyses

In further tests, we examine whether the association between FTR-strength and NND and between FTR-strength and net debt varies with the level of development of formal institutions in a country. To this end, we partition the sample into two subgroups based on whether a country falls below or above the median of the governance quality index (GQI), which is constructed as the first principle component of the World Governance Indicators (WGIs)], KOFGI [the KOF Globalization Index], EFI [the Index of Economic Freedom], and FDI [the Financial Development Index from the IMF]. We also bifurcate the sample into sub-samples based on dichotomous or binary indicators of economic development [MSCI, the classification of countries into emerging (EME) and developed (DME) groups based on the Morgan Stanley Capital International Market Framework] and legal origin [Civil vs. Common Law].

We then re-estimate Eq. (1) for each subgroup and tabulate the results in Table 4 (Panels A and B). Panel A shows that the coefficient of *weak-FTR* is salient for firms in countries with more developed institutions, higher levels of financial development, and legal origins rooted in the common law. We find similar differences in Panel B for the case of net debt. The differences are statistically significant at the 1% level, as indicated by the Wald test of the differences in the coefficients [the Equality test]. These results are interesting because they suggest that the relationship between FTR-strength and NND and between FTR-strength and net debt is conditional on the institutional setting within which a firm operates. However, they are unexpected and unique to the literature because one would expect the impact of informal institutions to be muted in countries with more developed institutions and financial conservatism to be prevalent in countries beleaguered with institutional voids. In sum, these results call for further research on how formal and informal institutions interact to shape corporate decisions in unanticipated ways.

Furthermore, to explore the potential channels through which the impact of FTR-strength on negative net debt policy is transmitted, we examine whether the effects of weak-FTR vary within a country conditional on financial constraints, product market competition, and corporate governance in Table A.4 in the Online Appendix. In these additional analyses, NND and low net debt are more prevalent among financially constrained firms, firms facing high product market competition, and firms with low corporate governance quality. These findings suggest that the impact of FTR-strength on negative net debt policies varies across different levels of financial constraints, product market competition, and corporate governance.

5. Robustness

In this section, we implement a battery of robustness tests and present the results in Table 5. We employ various proxies for the independent and dependent variables to mitigate the impact of measurement errors and to generalize our findings. Columns (1)

Table 3
The effect of FTR-strength on negative net debt.

Estimations	Probit						OLS					
Dependent variables	NPND	NPND	NPND	NPND	NPND	NPND	ND/TA	ND/TA	ND/TA	ND/TA	ND/TA	ND/TA
Independent variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
weak-FTR	0.2222***	0.3285***	0.3526***	0.3357***	0.3157***	0.3157***	−0.0463***	−0.0627***	−0.0662***	−0.0606***	−0.0577***	−0.0576***
	(0.0105)	(0.0110)	(0.0113)	(0.0120)	(0.0120)	(0.0121)	(0.0022)	(0.0020)	(0.0020)	(0.0021)	(0.0021)	(0.0021)
Tobin's *q*		0.1287***	0.1197***	0.1285***	0.1322***	0.1322***		−0.0261***	−0.0248***	−0.0260***	−0.0264***	−0.0264***
		(0.0049)	(0.0051)	(0.0052)	(0.0052)	(0.0052)		(0.0008)	(0.0009)	(0.0009)	(0.0009)	(0.0009)
Sales growth		−0.3400***	−0.3755***	−0.3380***	−0.3292***	−0.3303***		0.0624***	0.0667***	0.0599***	0.0586***	0.0593***
		(0.0131)	(0.0129)	(0.0129)	(0.0129)	(0.0129)		(0.0023)	(0.0023)	(0.0022)	(0.0022)	(0.0022)
ROA		1.7238***	1.7792***	1.9470***	1.9529***	1.9514***		−0.3661***	−0.3727***	−0.3970***	−0.3975***	−0.3973***
		(0.0509)	(0.0512)	(0.0525)	(0.0522)	(0.0522)		(0.0101)	(0.0102)	(0.0103)	(0.0102)	(0.0102)
Size		−0.0555***	−0.0555***	−0.0736***	−0.0812***	−0.0812***		0.0120***	0.0117***	0.0141***	0.0150***	0.0150***
		(0.0020)	(0.0020)	(0.0022)	(0.0022)	(0.0022)		(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)
PPE		−1.4626***	−1.5564***	−1.5688***	−1.5919***	−1.5925***		0.3233***	0.3353***	0.3329***	0.3345***	0.3349***
		(0.0282)	(0.0285)	(0.0290)	(0.0293)	(0.0294)		(0.0047)	(0.0047)	(0.0048)	(0.0048)	(0.0048)
DEP		−1.7213***	−1.0789***	−0.3190*	−0.0522	−0.0512		0.3711***	0.2670***	0.1411***	0.1098***	0.1081***
		(0.1746)	(0.1750)	(0.1756)	(0.1755)	(0.1757)		(0.0306)	(0.0308)	(0.0308)	(0.0308)	(0.0308)
R&D		4.5641***	4.8784***	4.9958***	4.9412***	4.9403***		−1.1171***	−1.1505***	−1.1742***	−1.1655***	−1.1651***
		(0.1482)	(0.1509)	(0.1548)	(0.1521)	(0.1521)		(0.0287)	(0.0288)	(0.0289)	(0.0286)	(0.0286)
Legal institutions			−0.5894***	−0.0191	−0.3368***	−0.3349***			0.0910***	−0.0207	0.0196	0.0200
			(0.0977)	(0.1087)	(0.1088)	(0.1083)			(0.0169)	(0.0179)	(0.0179)	(0.0178)
Political institutions			−0.7647***	−1.2317***	−0.7854***	−0.7783***			0.1770***	0.2188***	0.1624***	0.1564***
			(0.0836)	(0.0969)	(0.0979)	(0.0972)			(0.0149)	(0.0166)	(0.0169)	(0.0167)
Economic institutions			1.1347***	1.2764***	1.3209***	1.3265***			−0.2685***	−0.2652***	−0.2721***	−0.2745***
			(0.0649)	(0.0692)	(0.0687)	(0.0688)			(0.0114)	(0.0118)	(0.0118)	(0.0118)
Power distance				3.7295***	5.2864***	5.2888***				−0.9060***	−1.1080***	−1.0972***
				(0.4243)	(0.4347)	(0.4364)				(0.0736)	(0.0749)	(0.0751)
Masculinity				5.5025***	4.2073***	4.2361***				−0.9492***	−0.7963***	−0.8122***
				(0.2737)	(0.2809)	(0.2820)				(0.0469)	(0.0478)	(0.0479)
Uncertainty avoidance				3.3386***	4.9580***	4.9728***				−0.4142***	−0.6149***	−0.6298***
				(0.2709)	(0.2868)	(0.2877)				(0.0469)	(0.0501)	(0.0501)
Catholicism					−0.2936***	−0.2937***					0.0354***	0.0352***
					(0.0158)	(0.0159)					(0.0025)	(0.0025)
GDP growth						0.0618						−0.0649**
						(0.1560)						(0.0266)
Inflation						0.0588***						−0.0192***
						(0.0168)						(0.0040)
Constant	0.0943***	0.6142***	0.9245***	0.1800**	0.1084	0.0895	−0.0772***	−0.1813***	−0.2022***	−0.0390***	−0.0282**	−0.0183
	(0.0282)	(0.0398)	(0.0549)	(0.0770)	(0.0770)	(0.0787)	(0.0048)	(0.0067)	(0.0093)	(0.0133)	(0.0132)	(0.0135)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of observations	613,784	613,784	613,784	613,784	613,784	613,784	613,784	613,784	613,784	613,784	613,784	613,784
Pseudo-R^2	0.046	0.132	0.136	0.147	0.151	0.151						
Adj.R^2							0.084	0.247	0.254	0.265	0.267	0.268

The dependent variables are a dummy for negative net debt (NND) and the ratio of net debt to total assets (ND/TA). All variables used are defined in Table 1. ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 4
The impact of institutional factors.

Panel A: NND												
Dependent variables	GQI		KOFGI		EFI		FDI		MSCI		Legal origin	
	Low	High	Low	High	Low	High	Low	High	EME	DME	Civil	Common
Independent variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
weak-FTR	0.0108	0.5160***	0.1779***	0.2674***	0.0371	0.3075***	0.1561***	0.4175***	0.0709***	0.5256***	0.0967***	0.4656***
	(0.0295)	(0.0154)	(0.0233)	(0.0188)	(0.0330)	(0.0154)	(0.0288)	(0.0145)	(0.0237)	(0.0157)	(0.0267)	(0.0543)
Equality test		1123.00***		261.10***		400.40***		861.30***		1124.00***		86.79***
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of observations	173,081	440,703	304,401	309,383	174,092	439,692	139,458	474,326	194,592	419,192	373,942	239,842
Pseudo-R^2	0.121	0.176	0.167	0.179	0.130	0.166	0.152	0.163	0.142	0.176	0.155	0.183
Panel B: ND/TA												
Dependent variables	GQI		KOFGI		EFI		FDI		MSCI		Legal origin	
	Low	High	Low	High	Low	High	Low	High	EME	DME	Civil	Common
Independent variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
weak-FTR	−0.0248***	−0.0845***	−0.0418***	−0.0389***	−0.0291***	−0.0553***	−0.0370***	−0.0710***	−0.0291***	−0.0867***	−0.0196***	−0.1412***
	(0.0051)	(0.0026)	(0.0038)	(0.0031)	(0.0055)	(0.0027)	(0.0047)	(0.0025)	(0.0041)	(0.0026)	(0.0041)	(0.0100)
Equality Test		547.50***		140.50***		227.90***		444.80***		561.10***		112.00***
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of observations	173,081	440,703	304,401	309,383	174,092	439,692	139,458	474,326	194,592	419,192	373,942	239,842
Adj.R^2	0.224	0.294	0.306	0.292	0.223	0.288	0.279	0.277	0.263	0.290	0.272	0.303

The dependent variables are a dummy for negative net debt (NND) and the ratio of net debt to total assets (ND/TA). All variables used are defined in Table 1. ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 5
Robustness.

Panel A: Alternative variable definitions									
Dependent variables	NPND	NPND	ND/TA	ND/TA	NPNDLDA	NPND0	NPND1	NPND5	NPND10
Independent variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Verb Ratio	−4.6931***		0.8057***						
	(0.1635)		(0.0272)						
Sentence Ratio		−4.6922***		0.8054***					
		(0.1636)		(0.0273)					
weak-FTR					0.4687***	0.3239***	0.3355***	0.3032***	0.3236***
					(0.0113)	(0.0110)	(0.0106)	(0.0112)	(0.0105)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of observations	564,010	564,010	564,010	564,010	613,784	613,784	613,784	613,784	613,784
Pseudo-R^2	0.159	0.159			0.174	0.087	0.073	0.058	0.061
Adj.R^2			0.277	0.277					

Panel B: Alternative estimations, alternative subsamples and falsification tests												
Estimations	WLS1	WLS2	WLS1	WLS2	Matched Rep	Matched NoRep	Matched Rep	Matched NoRep	Entropy balancing		Pseudo tests	
Dependent variables	NPND	NPND	ND/TA	ND/TA	NPND	NPND	ND/TA	ND/TA	NPND	ND/TA	NPND	ND/TA
Independent variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
weak-FTR	0.2271***	0.1542***	−0.0406***	−0.0275***	0.3081***	0.3330***	−0.0606***	−0.0596***	0.3870***	−0.0681***	−0.0013	−0.0005
	(0.0134)	(0.0234)	(0.0022)	(0.0042)	(0.0240)	(0.0125)	(0.0040)	(0.0021)	(0.0186)	(0.0019)	(0.0035)	(0.0011)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of observations	613,784	613,784	613,784	613,784	60,766	427,118	60,766	427,118	619,310	619,310	613,784	613,784
Pseudo-R^2	0.135	0.111			0.164	0.152			0.173		0.144	
Adj.R^2			0.243	0.207			0.294	0.272		0.289		0.173

The dependent variables are NND — a dummy for negative net total debt, ND/TA — Net total debt (total debt *less* cash and cash equivalent), NNDLDA — a dummy for negative net long-term debt, NND0 — a dummy for negative net debt excluding firms with zero debt (total debt equals zero), NND — a dummy for negative net debt excluding firms with almost zero total debt (less than 1% total debt), NND5 — a dummy for negative net debt excluding firms with zero debt (less than 5% total debt) and NND0 —a dummy for negative net debt excluding firms with zero debt (less than 10% total debt). All variables used are defined in Table 1. ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 6
Additional tests.

Panel A: NND												
Subsamples	1980s	1990s	2000s	2010s	Pre-Crisis	Crisis	MAN	NON-MAN	Ex.Mult	Ex.Confucian	Ex.JPN	Ex.USA
Dependent variables	NPND	NPND	NPND	NPND	NPND	NPND	NPND	NPND	NPND	NPND	NPND	NPND
Independent variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
weak-FTR	0.9717***	0.4020***	0.2125***	0.2698***	0.2007***	0.1931***	0.4302***	0.2733***	0.2827***	0.2437***	0.2259***	0.2267***
	(0.0412)	(0.0223)	(0.0159)	(0.0167)	(0.0176)	(0.0182)	(0.0239)	(0.0140)	(0.0136)	(0.0163)	(0.0133)	(0.0137)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of observations	39,095	108,537	212,432	253,720	128,737	127,803	170,608	443,176	520,508	404,458	525,113	532,311
Pseudo-R^2	0.181	0.129	0.154	0.168	0.152	0.164	0.129	0.162	0.155	0.156	0.150	0.145
Panel B: ND/TA												
Subsamples	1980s	1990s	2000s	2010s	Pre-Crisis	Crisis	MAN	NON-MAN	Ex.Mult	Ex.Confucian	Ex.JPN	Ex.USA
Dependent variables	ND/TA	ND/TA	ND/TA	ND/TA	ND/TA	ND/TA	ND/TA	ND/TA	ND/TA	ND/TA	ND/TA	ND/TA
Independent variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
weak-FTR	−0.1322***	−0.0615***	−0.0393***	−0.0580***	−0.0345***	−0.0453***	−0.0722***	−0.0522***	−0.0526***	−0.0383***	−0.0434***	−0.0385***
	(0.0051)	(0.0035)	(0.0027)	(0.0029)	(0.0029)	(0.0031)	(0.0039)	(0.0025)	(0.0024)	(0.0027)	(0.0023)	(0.0023)
Constant	0.4649***	−0.1409***	0.0480***	0.0914***	0.0007	0.1747***	0.0021	−0.0022	−0.0522***	−0.4068***	−0.0837***	−0.0444***
	(0.0555)	(0.0243)	(0.0185)	(0.0162)	(0.0214)	(0.0202)	(0.0242)	(0.0159)	(0.0153)	(0.0185)	(0.0153)	(0.0137)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of observations	39,095	108,537	212,432	253,720	128,737	127,803	170,608	443,176	520,508	404,458	525,113	532,311
Adj.R^2	0.285	0.223	0.279	0.292	0.284	0.296	0.233	0.280	0.271	0.262	0.264	0.261

The dependent variables are a dummy for negative net debt (NND) and net debt (ND/TA). All variables used are defined in Table 1. ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively.

and (4) in Panel A of Table 5 show a significant negative correlation between NND and both *Verb Ratio* and *Sentence Ratio*, and a significant positive correlation between net debt and both *Verb Ratio* and *Sentence Ratio*. This finding aligns with our expectations: as with the *Verb Ratio* and *Sentence Ratio*, our alternative proxies of FTR-strength are inversely correlated with *weak-FTR* (see Chen et al., 2017). Additionally, in Columns (5)—(9) in Panel A of Table 5, tabulating the results for the five alternative proxies for NND [NNDLDA, NND0, NND1, NND5, and NND10], we find that *weak-FTR* is consistently and significantly positively correlated with our alternative proxies of NND, which further validates our main findings.

Next, we utilize weighted regressions in Table 5 (Panel B, Columns 1 to 4) to mitigate the impact of countries with many firm-year observations. In Columns 5 to 10 (Panel B), we employ propensity score matching (PSM) to closely match each firm in a weak FTR country with a firm in a strong FTR country. We also use entropy balancing to address potential bias stemming from confounding factors and endogeneity concerns (Jiang et al., 2018).[5] Columns (1) to (4) and (5) to (10) in Panel B of Table 5 show that weak-FTR has a significantly positive effect on the likelihood of adopting NND and low net debt, which aligns with our main findings. In Columns (11) and (12) of Panel B of Table 5, we conduct a falsification test to ensure that our results are not driven by factors unrelated to FTR-strength. We randomly assign firms to the weak-FTR and strong-FTR subgroups to implement the falsification test. Our results in Columns (11) and (12) in Panel B of Table 5 pass the falsification test, and the coefficients of "weak-FTR" are indistinguishable from zero.

In Table 6, we assess the sensitivity of our findings to the alternative subsampling approaches. We tabulate in Columns (1) to (12) in Panels A and B of Table 6 the results based on sub-samples from four different decades (i.e. the 1980s, 1990s, 2000s, and the 2010s), before and during the Global Financial Crisis [i.e. pre-Crisis (2002–2007) vs. Crisis (2008–2012)], by industry (manufacturing vs. non-manufacturing sectors), and by excluding specific countries, such as multilingual [Ex.Mult] and Confucian [Ex.Confucian] countries, as well as excluding Japan [Ex.JPN] and the USA [Ex.USA]. Our analyses show that, regardless of the sub-sampling approach used, the association between weak-FTR and a firm's decision to adopt an NND policy is consistently positive and statistically significant (at the 1% level). The results also show that weak-FTR has a consistently negative and statistically significant (at the 1% level) association with net debt, indicating more pronounced financial conservatism in weak-FTR countries.

We conducted a within-country analysis to address the concerns that our results might be influenced by other factors related to FTR-strength. This analysis is presented in Table A.5 in the Online Appendix. Since our variable is time- and country-invariant, we use a sub-sample of Swiss firms to alleviate this concern. Switzerland is ideal for our tests, as it is characterized by multilingualism and the coexistence of both weak-FTR and strong-FTR languages. More specifically, we categorized firms headquartered predominantly in French-, Italian-, and Romansh-speaking areas/cantons as belonging to the strong-FTR subgroup. Conversely, those headquartered in predominantly German-speaking areas/cantons were classified under the weak-FTR subgroup. As anticipated, Table A.5 in the Online Appendix demonstrates that *weak-FTR* is positively associated with NND and negatively associated with net debt, thus providing further evidence of the strength of our results.

6. Conclusion

This study presents evidence that the adoption of negative net debt (NND) and low net debt (ND/TA), which are both unconventional and unorthodox corporate financing strategies, are more prevalent in countries with languages with weaker future time references. These findings are robust to a host of concerns and pass the falsification test. We also provide evidence suggesting that the association between FTR-strength and the NND policy is reinforced in financially constrained firms, firms with weak governance, and firms operating in highly competitive industries. Additionally, we demonstrate that the likelihood of adopting NND and low net debt policies is salient in countries with legal systems based on common law and those with higher institutional and financial development levels. Our findings emphasize the impact of informal institutions, as exemplified by FTR-strength, on the increasing and puzzling prevalence of NND and low net debt policies and that such unconventional and unorthodox phenomena are amplified in contexts with more developed formal institutions. Consequently, our study implies that future research on the growing trend of financial conservatism should consider the interplay between formal and informal institutions, which, although overlooked in the literature, is important for understanding cross-country variations in corporate financing decisions. An emerging strand of studies. Hoang and Wiegratz (2023) contend that machine learning (ML) approaches yield better and novel proxies of variables and more accurate predictions than the traditional linear methods we employed in this study. Thus, future studies may investigate the interplay between FTR-strength and corporate NND and low net debt policies, using the ML approach.

CRediT authorship contribution statement

Marvelous Kadzima: Writing – review & editing, Writing – original draft, Supervision, Project administration, Conceptualization. **Michael Machokoto:** Writing – review & editing, Writing – original draft, Visualization, Software, Methodology, Formal analysis, Data curation, Conceptualization. **Tesfaye T. Lemma:** Writing – review & editing, Writing – original draft.

[5] Table A.3 in the Online Appendix shows that summary statistics for firms in weak-FTR and strong-FTR countries are more comparable after entropy balancing.

Data availability

The firm-level datasets that support the empirical findings of this study are available from *Thomson Reuters Datastream*. Restrictions may apply to the availability of these datasets, which were used under license. Macroeconomic data is publicly available from the World Bank. Data for indicators of financial development and institutional quality is available from the IMF and previous studies.

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This study has not been published previously and it is not under consideration for publication elsewhere. In addition, we certify that there are no potential conflicts of interest relating to the subject matter discussed in this study. The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of any organization with which the authors are affiliated. The usual disclaimer applies: any remaining errors are the sole responsibility of the authors.

Appendix A. Supplementary data

Supplementary material related to this article can be found online at https://doi.org/10.1016/j.frl.2024.105665.

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