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Retrospective wisdom: Long-term orientation and the rating downgrades of financial institutions

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Abstract: This study examines the effects of Hofstede's long-term orientation (LTO) on the rating changes of financial institutions (FIs) in 50 countries. The impacts of LTO on rating downgrades are stronger for the sample of speculative grade-rated FIs and more pronounced for crises sample. The significance effect of LTO on downgrades is robust to various tests and is unlikely due to endogeneity. Switching from a short term- to a long term (LT)-oriented culture lowers the downgrade risk of an FI by 47%, a speculative-grade rated FI by 56%, and an FI of a country in crisis by 58%. LT-oriented societies promote responsible borrowing and a good payment culture. A strong preference for long-term business survival motivates banks in LToriented nations to maintain a more prudent bank credit to bank deposits ratio, particularly during crises. Incorporating LTO in banking regulations may encourage banks to adopt longterm perspectives and finance long-term sustainable projects.

JEL Classification: G24

Keywords: Long-term orientation; National culture; Hofstede; World Value Survey; Rating downgrades.

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1. Introduction

One of the three aims of the European Commission's Action Plan on "Financing Sustainable Growth" is to "foster transparency and long-termism in financial and economic activity" (EC, 2018). In response to a call for advice regarding this objective of the Action Plan, the European Banking Authority published a report in which it called on banks to "promote long-term perspectives, disclose long-term risk and opportunities, and incorporate long-term horizons" in their strategies and business activities (EBA, 2019).

Bankers ranked "short-termism the second most worrying aspect of banking culture" in a survey conducted by Deloitte (2013, p. 17). According to Sir John Kay, "… failed banks were characterised by acute short-termism and serious hyperactivity" (Kay, 2012, p. 19). For the purpose of risk management, it is important to understand the impact short-termism exerts on the *evolvement* of credit risk of a bank *before* it succumbs to failure.

Banks are "a mirror of society" in which they operate (Deloitte, 2013). Bank managers need to make decisions that are compatible with the cultural orientation prevailing in their country. To examine the degree of short-termism of a financial institution (FI), this study utilises the long-term versus short-term orientation (LTO) value of the nation where it operates.[1] Considering data availability for a large sample of 1,544 FIs in 50 countries over a long period, this study employs credit rating as a measure of credit quality.[2] It is worth noting that the focus of this study is *not* on the rating grade but the *change* in rating grade that captures the *evolvement* of credit risk of an FI.

[1] The degree of LTO in a country correlates with firm uses of relationship bank financing (Antonczyk *et al.*, 2014).
[2] The advantages of using credit rating are discussed in section 3.1. Using credit risk measures that require market data such as distance to default, credit default swap or credit spread will result in a much smaller sample of firms and countries and a much shorter study period.

The aim of this study is to gain a strong understanding of the influences of short-term (ST)/ long-term (LT) orientation on the rating transition dynamics of financial firms over a unique period during which short-termism permeated bank practices across markets. As short-termism was one of the key "culprits" of the Global Financial Crisis (GFC) (Bair, 2011; EBA, 2019), the period leading to the GFC provides an ideal setting to conduct this study. The study spans a period starting from April 1986 to September 2010. The study ends at the third quarter of 2010 as the Dodd-Frank Wall Street Reform and Consumer Protection Act (DFA) was signed into the U.S. law in the same quarter.[3]

This study is motivated by three key challenges facing FIs, namely conduct risk and culture failure, long-term sustainability risk and opportunities, and global macro-economic vulnerability. These three challenges, as briefly outlined below, provide a context within which it is increasingly important to understand and predict FI robustness to these challenges. Analysis of the effect of LTO may help in this regard.

First, over the past decade the global financial system has *not* entirely emerged from a poor reputation due to serious scandals (TGT, 2018, pp. 4-5). Bank CEOs were typically compensated based on the *current year*'s earnings or *short-term* share price performance without considering the risk taken over time (Bair, 2011). Bank managers, under strong pressures from their Boards and investors who may sell their shares if a bank misses its quarterly earnings target, have strong incentives to maximize *short-term* returns.[4]

[3]The DFA substantially changed the regulatory frameworks governing the operations of FIs and credit rating agencies (CRAs). The DFA enhanced the regulation of CRAs, expanded potential liability by making litigation against them easier, removed their exemption to get access to company information which is not released to the public, required them to provide information on rating methodologies and track record, and to improve internal control and governance. For FIs, the DFA required large banks to take periodic stress tests to ensure that they survive a financial crisis. Bank stress tests have been carried out annually in both the U.S. and Europe. Bank regulations on remuneration were re-designed, and stringent capital requirements were also enacted across continents following the GFC.

[4] Graham *et al.* (2005) conduct a survey of 401 financial executives and report that 78% would ignore a profitable project if it led to missing the *current* quarter's earnings target. Bailey *et al.* (2014) conduct a global survey of more than 1,000 board members and C-suite executives. Among survey participants, 79% were under the pressure to deliver strong performance within a *two-year* period, 46% reported the *short-term* pressure from their Boards whereas Board members indicated that the *short-term* pressure came from institutional investors.

The second challenge facing FIs is their short-term horizons and sustainability-related practices. In January 2022, the European Central Bank (ECB) launched a supervisory climate risk stress test to assess how well prepared banks are in coping with economic and financial shocks related to climate risk (ECB, 2022). The mismatch between the traditional time horizons of banks (typically three years) due to funding structure and the long-term nature of sustainability risk depicts an inherent element of short-termism in the sector (EBA, 2019). The results of this study may help to understand which banks are more likely to be involved in sustainability projects.

The third challenge facing FIs is global economic vulnerability. Over the past decade, banks lent out at exceptionally low interest rates that do not commensurate with the imminent default risk (Lachman, 2022). Widening credit spreads, high inflation, and interest rate hikes across major markets will make borrowers more vulnerable, drive many corporate debts below investment grade, and intensify the level of credit risk faced by FIs.

The evidence of culture significance in credit rating literature is rather limited. Dang and Partington (2020) find that national culture traits of individualism and LTO affect both *sovereign* rating levels and *sovereign* rating changes.[5] Dang (2018) also reports that national culture dimension of LTO significantly *reduces* rating downgrade probabilities of *non-financial* firms. This study builds up on the above two studies and answers the following question: **How did LTO affect the rating migration hazard of an FI?**

This study is the first to examine the effect of LTO on the credit risk of FIs. This study differs from Dang (2018) and Dang and Partington (2020) in the following respects. *First*, I explore *financial* firms which are typically large cap and highly leveraged. FIs, on average, maintain an *investment grade rating* of A- across my sample periods (including crises). In contrast, *non-financial* firms in Dang's (2018) study, on average, have *speculative grade rating*

[5] Dang and Partington (2020) argue that a high blood pressure and/or high cholesterol raises the risk of a stroke and a heart attack. Similarly, certain culture trait(s) may lead to a higher downgrade risk.

of BB during the period 1985-2010 and B+ during crises (Panel B, Table 1). FIs have markedly different migration profiles compared to those of non-financial firms (Panels C and D, Table 1). Over a comparable study period, FIs in my sample enjoy a much lower downgrade frequency (35.7% versus 60.85%) and a higher upgrade frequency (27.3% versus 23.48%) than corporates in Dang's 2018 sample However, during crises, FIs are slightly more (less) likely to be downgraded (upgraded), and downgrades tend to be swifter. These empirical differences raise the need for a study that solely focuses on credit rating migrations of FIs. *Second*, I provide robust results of the impact of LTO, which are drawn from *extensive* analyses. For example, I treat *not rated* FIs as those which would have chosen to withdraw from being rated instead of facing the risk of being downgraded. I also use weighted Universal Time Preference (UTP) constructed by Rieger, Wang, and Hens (2021) as an alternative measure for Hofstede's LTO, which adds robustness to my results. Neither Dang (2018) nor Dang and Partington (2020) carries out these robustness analyses. *Third*, I estimate both dynamic hazard *and* logit models for rating changes, and address endogeneity concerns by carrying out two-stage residual inclusion procedure using instrumental variables. Dang (2018) and Dang and Partington (2020) only estimate hazard models for rating changes, and do *not* address endogeneity concerns (i.e. omitted variables).[6] *Fourth*, I provide various *empirical* analyses that outline the two channels through which LTO affects individuals' behaviours and banks credit to banks deposit. Neither Dang (2018) nor Dang and Partington (2020) conducts any *empirical* channel analyses.

This study has practical implications to banking prudential regulations. Under the BASEL III framework, long-term infrastructure projects with extended maturities are subject to punitive capital treatment. Further, the net stable funding ratio requires a bank to match lending with stable funding sources instead of relying on short-term funding. These regulations

[6] Dang and Partington (2020) address endogeneity concerns in their probit modelling of rating levels but do *not* for the hazard modelling of rating changes. Both studies state that the hazard model has no error term; however; this does not eliminate concerns about omitted variables in their hazard models.

may unintentionally discourage banks from providing long-term loans to "green" projects, and banks may exert pressures on corporate counterparts for short-term earnings. Bank regulations should be fine-tuned to consider the degree of LTO in a country and encourage long-term debt financing to sustainable projects.

The rest of the paper is organized as follows. Section 2 reviews the relevant literature. Section 3 presents the data and method. Section 4 discusses estimation results. Section 5 presents additional analyses of two potential channels, and section 6 concludes.

2. Literature review and hypotheses

This study examines the national culture dimension of LTO established by Hofstede *et al.* (2010).[7] LT-oriented societies value thrift, self-discipline and focus on long-term goals and long-term performance. In my view, LTO affects an FI's downgrade risk directly by shaping its policies, and indirectly through its impacts on attitudes and behaviours of individual and corporate counterparts, its impacts on national macro-economic conditions, and its influences on analysts' assessments of the probability of extraordinary external support/ intervention as well as of sovereign related risk.

2.1. Literature review

At the individual levels, there are mixed evidences on the relationship between patience (LTO) and risk preference. On the one hand, Frederick (2005) reports that undergraduate students at various U.S. universities in the midwest and northeast who possess high cognitive reflections tend to be less risk averse but more patient. On the other hand, ST-oriented investors strongly focus on immediate outcomes and exhibit a tendency to spend (instead of saving). People in ST-oriented societies are more likely to engage in opportunistic behaviours (Doney

[7] Hofstede's measures are not without criticism (Baskerville, 2003). However, Hofstede's culture studies have been extensively cited (see citation statistics in Karolyi, 2016, p. 614). Most of culture traits established recently correlate with Hofstede's culture dimensions (Leung *et al.*, 2005). Thus, I use Hofstede's LTO value in the main analyses. In robustness tests, I use the LTO value proposed by Tang and Koveos (2008) and UTP measure established by Rieger *et al.* (2021).

et al., 1998) and more likely to tolerate unethical business practices (Cohen *et al.,* 1996). A large short-term shareholder base drives bank executives to set flawed targets, prioritise short-term earnings over long-term value creation, and focus on shareholder distributions. Performance incentives are often "lopsided" and encourage excessive and imprudent risk taking practices (Deloitte, 2013). This strand of research suggests that impatience (ST orientation) is related to conduct risk and risk taking behaviours.

At the corporate level, LTO correlates positively with corporate uses of bank relationship lending (instead of bond issuance). Bank financing serves as "an insurance against inefficient liquidation," particularly when the causes of financial distress are not related to project quality (Antonczyk *et al.,* 2014). Firms in LT-oriented societies, which tend to invest in long-term projects and value loan re-negotiability, thus prefer bank lending.

On average, long-term firms, relative to their short-term peers, achieve superior financial performance, spend more on research and development, accumulate greater market capitalisation, generate higher return to shareholders, create more jobs, and are more resilient during and after the GFC (McKinsey Global Institute, 2017). Firms in LT-oriented nations are more forward looking, more adaptable (Zheng *et al*., 2012), use more hedging (Lievenbrück and Schmid, 2014) and enjoy a lower downgrade hazard (Dang, 2018). The above evidence suggests that LTO influences an FI's downgrade risk through its influences on corporate outcomes and corporate risk dynamics.

The roles LTO plays in shaping bank policies have *not* been widely examined. Banks in LT-oriented societies pay lower dividends and are less likely to pay dividends (Zheng and Ashraf, 2014). Instead, they spend more of their earnings on long-term growth. Banks in ST-oriented nations chase short-term gains by borrowing aggressively, resulting in a higher degree

of financial leverage (Haq *et al.*, 2018). As LTO contributes to shape a bank's dividend policy and capital structure, it feeds into the rating assessments of FIs conducted by S&P's.[8]

LT-oriented societies are characterised by higher growth and savings rates (Hofstede *et al.*, 2010; Srivisal, Sanoran, and Bukkavesa (2021), higher sovereign rating grades and lower sovereign rating downgrade hazards (Dang and Partington, 2020). Sovereign ratings were often used as ceilings for corporate ratings within a nation, and macro-economic activities are the key drivers of rating changes of financial firms (Dang, 2019). Thus, LTO indirectly influences rating regrades of FIs via its influences on macro-economic conditions and sovereign ratings.

2.2. Hypothesis development

The rating assessments of FIs employed by S&P's utilises both quantitative and qualitative information (S&P's, 2022). While culture is not a direct input of the rating process, it affects the rating decisions via analysts' assessments of macro-economic risk, sovereign creditworthiness, and potential government intervention/ support. Specifically, S&P's evaluate the probability of "extraordinary external support," including government and group support, or the risk of extraordinary negative intervention or sovereign related risk. These considerations matter most in times of crises. Thus, rating analysts may need to rely more on "soft" information, such as culture characteristics, during crises to assess the probability of "extraordinary external support" and sovereign-related risk.[9]

In times of market turbulence, FIs' depositors, particularly those dominated by an ST orientation, may withdraw en masse and trigger a bank run. FIs are highly leveraged; however, LT-oriented FIs tend to borrow less (Haq *et al.*, 2018) and thus, are able to withstand runs better than ST-oriented peers. This suggests that LTO may affects both depositors' decisions and

[8] S&P's examines FI-specific characteristics including business position, capital and earnings, risk position, and liquidity (S&P's, 2022).

[9]Culture affects the preferred financial system (Kwok and Tadesse, 2006) and legal institutions (Licht, Goldschmidt, Schwartz, 2005); both are likely to affect a government's responses to distressed FIs in times of crises. Culture including LTO also influences sovereign ratings and sovereign rating changes (Dang and Partington, 2020).

banks' resilience, and its effect is likely to be more pronounced during crises. In line of the above arguments, I put forward a directional hypothesis that **LTO statistically and significantly lowers an FI's downgrade risk, and this impact intensifies during crises when runs are more likely to occur.** There is no prior expectation regarding the effect of LTO on rating upgrades.[10]

In general, regulations either do not allow institutional investors to hold speculative grade-rated securities or require them to hold extra capital against these securities (Cantor and Packer, 1997). When an issuer loses its investment grade status, it will no longer enjoy great demands from the public. Their securities will only be suitable to a small subset of investors who do not subject to rating-related restrictions (Ferri, Liu and Stiglitz, 1999, pp. 335-336). Guiso *et al.* (2004) suggest that societies with strong social capital [for example, LTO cultures] tend to impose social stigma to deviant members. FIs are typically rated investment grade (Panel B, Table 1). FIs at the investment rating boundary (BBB-, BBB, BBB+), speculative ratings (BB+ or below) and those experienced a downgrade at lag-one rating are vulnerable to downgrades and are under intense scrutiny of market participants. These "deviant" FIs should pay particular attention to the surrounding cultural and social norms. Managers of these FIs also need to make decisions that meet the expectations of investors whose investment horizons have become markedly shorter.[11]

Firms voluntarily release good news but hesitate to release bad news to the market (Goh and Ederington, 1999). The relevant information of investment grade-rated FIs may be more available than that of speculative grade rated firms.[12] So, analysts may need to rely more on

[10] Being confidence and capital sensitive entities, FIs need to maintain sound credit profiles to raise deposits and avoid runs. This inherent characteristic suggests that culture is likely to have a muted effect on rating upgrades.
[11]The average holding period of shares traded on the New York Stock Exchange significantly reduced from seven years to seven months between 1940 and 2007 (Bair, 2011). Similarly, the average holding period of equities in the EU markedly decreased from about eight years 20 years ago to merely eight months recently (EU HLEG, 2018). On average, equity managers turn over their *entire* portfolio in 20 months (Dell and Bernhardt, 2017).
[12] I thank a reviewer for this suggestion.

"soft" information (for example, culture) to assess high-risk FIs, particularly at times when bank runs driven by market panics are more likely to occur. Bonsall, Koharki, Kraft, Muller, and Sikochi (2022) report that qualitative soft rating adjustments made by credit rating agencies (CRAs) are more accurate as issuers' default risk heightens. Further, soft adjustments' relevance increases with issuers' default risk. In terms of a potential mechanism to produce more accurate and relevant soft adjustments, they report that CRAs assign better educated and more experienced analysts to higher-risk issuers. Their study concludes that CRAs act more cautiously toward issuers with a higher likelihood of default. In line of this evidence, I propose a directional hypothesis that **LTO statistically and significantly lowers an FI's downgrade risk, and this impact is stronger for high-risk FIs.**

3. Data and method

3.1.Rating data

This study uses Standard & Poor's (S&P) foreign currency issuer rating data of financial firms obtained from Ratings Xpress. Güttler (2011) finds that S&P's is more responsive than Moody's, suggesting that ratings issued by S&P's are timelier than those assigned by Moody's. The data includes current rating grades, rating history, outlooks and Credit Watches (CW).[13] Considering the availability of control variables including time-varying outlook and rating history, my study covers the period April 1986-September 2010. It ends in the same quarter the Dodd-Frank Wall Street Reform and Consumer Protection Act was signed into the U.S. law.

Employing credit risk measures constructed based on market data would lead to a much smaller sample and a shorter period of study, which is likely to affect the reliability and robustness of the analyses. Further, changes in measures using market data are *not* always

[13] Outlook/CW signals the potential direction of a long-term rating over an intermediate term/ a short-term period.

driven by fundamental changes in a firm's creditworthiness whereas a change in credit rating reflects a permanent change in a firm's credit quality.[14]

This study employs *various* aspects of rating history and the current rating grade, which captures the overall credit quality of an FI, as firm-specific control variables. Compared with historical financial metrics, rating-based variables offer several advantages. *First,* prior rating path reveals important information about a firm's credit risk dynamics and its potential rating changes (Figlewski *et al.*, 2012; Dang, 2018). For example, a downgrade at lag-one rating raises the likelihood of a subsequent downgrade (Altman, 1998; Figlewski *et al.*, 2012, Dang, 2019). Second, I employ *time-varying* outlook/CW which overcomes the limitation of historical financial data and allows me to add an enhanced forward-looking perspective in all analyses. *Time-varying* outlook/CW signals the change in an FI's credit quality while its rating remains unchanged. Empirical studies report that both exhibit the predictive accuracy of future rating regrades (Vazza *et al.*, 2005b; Bannier and Hirsch, 2010) and accurately determine the information value of rating changes (Binici and Hutchison, 2018).

3.2.Method

The Cox hazard model (Cox, 1972) has been widely used in bankruptcy and rating migration studies (Figlewski, Frydman, and Liang, 2012; Dang, 2018). The following *stratified dynamic* Cox hazard model is estimated separately for rating downgrade and rating upgrade:

$$h_{m,s}(t, Z, Z(t)) = h_{(0,s)}(t) \exp[Z_j^m \beta_j + Z_p^m(t)\beta_p] \quad (1)$$

Where: $h_{m,s}(t, Z, Z(t))$ is the migration hazard of rating observation m in stratum s at time t given its time-fixed covariate vector Z_j^m and its time-varying covariate vector $Z_p^m(t)$. $h_{(0,s)}(t)$

[14] Changes in market-based credit risk measures can be driven by investor sentiment and herding behaviour. Chang and Lin (2015) find that culture affects investor's herding behaviour. To account for the pro-cyclicality in ratings (Ferri *et al.*, 1999), I include *dummy crisis* variable in all analyses. I also conduct an analysis for FIs at the time their residing nations experienced either a systemic bank crisis or a sovereign debt crisis.

is the baseline hazard of a migration in stratum s at time t. β_p and β_j is the vector of estimated coefficients for time-varying covariates $Z_p^m(t)$ and time-fixed covariates Z_j^m, respectively. The estimation makes use of event time (instead of calendar time) risk set; each set includes FIs that are at risk of a rating change at the event time an FI in the sample is regraded. In estimating the downgrade model, downgrades (upgrades) are treated as events (censored), and vice versa.

The *stratified dynamic* Cox hazard model offers several attractive features (Allison, 1995). First, the *stratified* model considers the sequence of repeated rating changes of an FI. This is important as each FI often contributes several ratings to the study, and ratings of various sequences should *not* be treated equivalent (Hosmer *et al.*, 2008). This model estimates a *unique* time-varying baseline hazard for each stratum that includes ratings of the same sequence. Second, the *dynamic* model allows for the updating of *time-varying* outlook/CW and *time-varying* rating age while a rating spell unfolds. Third, the *hazard* model is semi-parametric and does not require any assumptions about the distribution of survival times.

3.3.Variables

Appendix A includes the list of employed variables, their definitions, and references to relevant work. Previous studies report the significant effects of four other national culture traits established by Hofstede (1980) on mortgage defaults (Tajaddini and Gholipour, 2017), bank leverage (Haq *et al.*, 2018) and bank failures (Berger *et al.*, 2021). Thus, I include these four culture dimensions, namely power distance index (PDI), uncertainty avoidance index (UAI), individualism (IDV) versus collectivism, and masculinity (MAS) versus femininity, as control variables in all analyses. In the main analyses, I use Hofstede's culture dimensions. In robustness tests, I employ two alternative measures of LTO. First, I consider LTO and four corresponding culture measures (PDI, IDV, MAS, UAI) established by Tang and Koveos

(2008) to replace Hofstede's five measures.[15] Second, I use weighted Universal Time Preference (UTP) proposed by Rieger *et al.* (2021). This measure is constructed based on the ten measured variables of time preferences including LTO derived from World Value Survey and Future Orientation from GLOBE. I employ weighted UTP (UTP10) with the country weights recommended by Rieger *et al.* (2021). When UTP is employed to replace Hoftstede's LTO, the values of the four control culture traits (PDI, IDV, MAS, UAI) are Hofstede's values.

For each migration outcome (downgrade and upgrade), a base and an extended model are estimated. The base model includes similar controls as in Dang (2018)'s study of culture and the rating migrations of *non-financial* firms, with two exceptions. *Dummy OECD* is replaced by *dummy WTO*[16] and *return of world stock market index* is replaced by *return of financial sector market index.* Control variables (aside from Hofstede's four culture dimensions) include an FI's *current rating grade*, time-varying outlook/CW, various aspects of rating history, and country-level characteristics that proxy for economic and political conditions (see Appendix A). Time-varying variables (outlook/CW, rating age) are updated whenever an event of interest occurs in the sample, thereby capturing a deterioration/an improvement in an FI's credit quality and the passage of time while its current rating remains unchanged. Rating-specific variables (*current rating grade* and most of rating history variables) are updated at the start of a rating observation. Most country-specific variables are updated annually. Exceptions include *return of financial sector market index, dummy WTO member, dummy prior default,* and *dummy crisis;* each is updated at the beginning of a rating spell.

The extended hazard model includes six additional variables that capture a nation's financial structure and legal institutions. These variables (as discussed below) have been

[15] Tang and Koveos (2008) find that culture strongly correlates with economic development levels, and they update Hofstede's culture values (LTO, PDI, IDV, MAS, UAI) based on changing economic conditions across countries.
[16] Once a country has been admitted to the World Trade Organisation (WTO), it has to open its economy and comply with agreed-upon financial sector adjustment programmes. These programmes may lead to a lower level of discretion to national regulators to decide the structural characteristics of a country's domestic financial sector.

identified to be significant determinants of bank risk-taking behaviour. First, the presence of an explicit deposit insurance scheme correlates with bank risk-taking (Anginer *et al.*, 2014; Haq *et al.*, 2018), depositors' poor discipline on banks, moral hazard problems, and systemic bank crises (Demirgüç-Kunt and Detragiache, 2002). The existence of an explicit scheme, however, could reduce the risk of runs (Fungáčová and Weill, 2013).

For *activity restrictions*, the evidence is also mixed. Lenient restrictions allow banks to diversify activities and improve stability (Barth *et al*., 2004) whereas tougher restrictions result in a more fragile banking system (Barth *et al.*, 1999). An alternative view is that stringent restrictions require banks to invest more prudently (Berger *et al.*, 2021). Consistent with this view, Beltratti and Stulz (2012) report that large banks in nations where activity restrictions were stricter "performed better and decreased loans less" during the crisis.

For legal institutions, banks in countries with better *creditor rights* tend to take more risk while banks in nations that have explicit *information sharing* mechanisms are more cautious (Houston *et al*., 2010). Similar to Berger *et al.* (2021), I take into account the quality of oversight in the financial sector in each nation (the presence of *multiple supervisors)*. I also consider the level of *law enforcement* in a country, as in Laeven and Levine (2009).

3.4.Sample

For each set of culture values, a sample of ratings with outlook (CW) is constructed. Each rating observation in the outlook (CW) sample had at least one outlook (CW) and at least one prior rating regrade during the study period. This ensures that there is a rating history and a rating change precursor for each observation.

Due to missing values for Tang and Koveos' culture scores and other control variables, sample sizes vary across model specifications. The sample with Hofstede's values/ UTP value and outlook used to estimate the *base* model includes 3970 ratings of 1544 FIs from 50 countries. The respective sample with Tang and Koveos (TK)' values consists of 3709 ratings

of 1465 FIs from 39 countries. The samples with CW used to estimate the *base* model are smaller than the corresponding samples with outlook.[17] In the interest of creating a large sample of FIs and cultures, I use the samples with outlook (OL) in the main analysis and the samples with CW in a robustness test.

Panel A of Table 1 presents the statistics of Hofstede's culture scores for the main sample with OL used to estimate the *extended* model. The rest of Table 1 features the statistics of S&P's numerical rating grades (Panel B), durations of downgrade observations (Panel C), durations of upgrade observations (Panel D) for the Hofstede's main samples, Hofstede's non-U.S. sample, and Hofstede's crisis sample used to estimate the *extended* hazard models. For ease of comparison, the corresponding statistics for *non-financial* firms reported in Dang (2018) are included in parentheses next to my statistics in Panels B, C, and D.

TABLE 1 ABOUT HERE

4. Estimation Results

For each rating migration outcome (downgrade and upgrade), two model specifications are estimated. The extended model includes all variables in the base model and six additional variables that capture the financial structure and legal institutions in each country.

4.1.Main analysis

The results of the Cox dynamic hazard models for downgrades and upgrades are presented in Table 2. Columns (2-5) present the results of the models with Hofstede's culture dummies. If the value of a nation's culture trait is greater than or equal to the mean value for that dimension, a dummy is set equal to one, and vice versa.[18] Columns (6-9)/ (14-17) show the results of the models with Hofstede's numeric scores/ TK's numeric scores (robustness test). Columns (10-13) feature the results of the models with UTP being used as an alternative

[17] Sample of Hofstede's (TK's) values and CW includes 2152 (2064) ratings of 980 (938) FIs from 42 (33) countries.
[18] As in Dang and Partington (2020), dummy variables are employed to capture the rankings across nations. The value of a culture dimension for a country may change slowly over decades or centuries. However, the rankings across countries are relatively stable (Hofstede *et al*., 2010; Beugelsdijk *et al*., 2015).

measure for LTO, and other four culture metrics being Hofstede's scores (robustness test). For brevity reason, only the hazard ratios of *LTO/ Dummy LTO/ UTP* are presented in parentheses next to the corresponding estimates.

TABLE 2 ABOUT HERE

Overall, *dummy LTO/LTO/ UTP* is significant and has a negative coefficient sign in all models for downgrades.[19] Switching from an ST- to an LT-oriented culture (*dummy LTO*=1), which reflects a substantial change across the two poles of this dimension, lowers the downgrade risk of an FI by 46.9% (0.531-1=-0.469, column 3).[20] A one-point increase in Hofstede's LTO and TK's LTO reduces the downgrade hazard by 1.5% (0.985-1=-0.015, column 7 and column 15).

Among four measures of LTO, UTP is the only one that is statistically significant in all models for downgrades and upgrades. A one-point increase in UTP makes a downgrade 39% less likely (0.61-1=-0.39, column 11) and an upgrade 44.3% more likely (1.443-1=0.443, column 13).

Of the four control culture variables, none is *consistently* statistically significant in all four *extended* hazard models for downgrades/ upgrades. The following discussion focuses on the *key* control variables that are consistently significant across *extended* models. For rating variables, *dummy negative (positive) outlook* has a substantial effect; it makes a downgrade (an upgrade) more likely and an upgrade (a downgrade) less likely. FIs with a high *current rating grade* tend to travel downward (instead of climbing upward) the rating scales. FIs rated BB+/BB/BB- (*junk rating boundary)* and FIs that were downgraded at lag-one rating (*dummy lag one downgrade)* are more likely to plunge to the lower end of the rating spectrum. The latter

[19] p<0.0001 in models 2, 3, 6, 7; p=0.0613 and 0.0008 in models 10, 11; p=0.006 and 0.0003 in models 14, 15.
[20] This large effect is common in hazard modelling as switching from an ST to an LT orientation represents a substantial change. The reduction in downgrade risk given a one-point change in LTO is estimated by subtracting one from the hazard ratio.

is consistent with the evidence of downward momentum in the rating dynamics of both financial and non-financial firms.[21]

In terms of macro-economic conditions, FIs in countries that are members of the WTO *(dummy WTO member)* have a favourable experience toward upgrades. In times of a crisis (*dummy crisis)*, FIs are more likely to be downgraded and less likely to be upgraded. A higher return of the financial sector index *(return of financial sector market index)*, a higher real GDP growth rate (*change in real GDP growth rate)*, and an improvement in the current account balance *(change in current account surplus/GDP)* reduce the probability of a downgrade. FIs in nations with a developed equity market (*logarithm of ratio stock market cap/GDP)* experience fewer migrations whereas FIs in countries with a high GDP per capita (*logarithm of GDP per capita)* are often more volatile.

In societies with either a low or a high level of political rights and civil liberties, regrades occur less often and ratings seem to be more stable. FIs in nations with low political rights are often State-owned, and regulators are more likely to bail them out, instead of letting them fail. Thus, it is not surprising that they are less likely to be downgraded, similar to their peers in countries with a high level of political rights.

For financial structure and legal institutions, *no deposit insurance dummy* and *legal enforcement* each is significant in all four extended downgrade models. The absence of a deposit insurance scheme makes a downgrade less likely while a high level of law enforcement is associated with a greater downgrade hazard.

4.2.Robustness tests

a. Robustness tests using Cox's hazard model

The statistically significant effect of LTO on downgrade hazard is robust to the use of TK and UTP scores and the use of additional control variables. To check the robustness of the

[21] See Carty and Fons (1994), Altman (1998), Figlewski *et al.* (2012), Dang and Partington (2014), Dang (2019).

main result, I conduct additional analyses using an alternative rating change precursor (CW), an alternative treatment of *not rated* FIs, various samples of FIs, and an alternative estimation method. Tables 3-5 present the sample sizes, model's likelihood ratios, the coefficient estimates and hazard ratios of LTO in the hazard extended models for downgrades and upgrades.[22] I employ four measures of *LTO* (Hofstede's *LTO*, Hofstede's *dummy LTO*, TK's *LTO*, and *UTP*) in these robustness analyses. The following discussion focuses on the effects of four measures of *LTO* in each robustness analysis for downgrades.

TABLE 3 ABOUT HERE

In columns 1-2 (downgrades) and 7-8 (upgrades) of Table 3, I employ time-varying CW to replace time-varying outlook. I find that all four measures of LTO reduce the downgrade hazard but only TK's LTO is statistically significant (at 5% level). A one-point increase in TK's LTO lowers the downgrade hazard by 1.3% (0.987-1=-0.013, column 1).

In columns 3-4 (downgrades) of Table 3, I treat *not rated* FIs as those which would have experienced a downgrade immediately after leaving the study. FIs of declining credit quality may choose not to be rated to avoid an imminent downgrade. In this situation, a withdrawal from being rated is a substitute for being downgraded. This informative censored observation introduces bias into parameter estimates (Allison, 1995). Treating *not rated* observations as downgrades will raise the number of downgrade observations but will not affect upgrade cases and upgrade models. The results in columns 3-4 show that all four measures of LTO are statistically significant (at 5% level) and have a negative coefficient sign. Switching from an ST- to an LT orientation (*dummy LTO* =1) reduces the downgrade hazard by 34.7% (0.653-1=-0.347, column 4). A one-point increase in Hoftstede's LTO, TK's LTO, and UTP respectively makes a downgrade 1.1%, 1.1%, and 23% less likely (column 4).

[22] For brevity reasons, I only present the coefficient estimates and hazard ratios of LTO in Tables 3-5.

In columns 5-6 (downgrades) and 9-10 (upgrades) of Table 3, I exclude U.S. FIs, which accounts for 41.07% of the Hofstede's sample, from each sample. I found that all four measures of LTO are statistically significant (at 10% level) and consistently lower the downgrade hazards. Moving from an ST- to an LT focus (*dummy LTO*=1) results in a 20.5% lower downgrade hazard (0.795-1=-0.205, column 6). A one-point increase in Hofstede's LTO, TK's LTO, and UTP reduces the downgrade hazard by 1.2%, 1.4%, and 34.8% respectively (column 6).

Table 4 presents the results of the hazard extended models for downgrades and upgrades using a sample of FIs at the time their residing nations experienced either a systemic bank crisis or a sovereign debt crisis as listed in Manasse *et al.* (2003), Laeven and Valencia (2008), and De Paoli *et al.* (2009). I find that 3 out of 4 measures of LTO are statistically significant in downgrade models (at 1% level) and 2 out of 4 are significant in upgrade models (at 5% level). Their coefficients have a consistent negative sign on downgrades and a consistent positive sign on upgrades. Switching from an ST to an LT focus (*dummy LTO*=1) during a crisis reduces the downgrade hazard by 58.1% (0.419-1=-0.581, column 2). During a crisis, a one-point increase in Hofstede's LTO makes a downgrade 2% less likely (0.98-1=-0.02, column 2) and an upgrade 3.4% more likely (1.034-1=0.034, column 4).

TABLE 4 ABOUT HERE

Table 5 presents the results of the hazard extended models for downgrades and upgrades of three high-risk subsamples namely speculative (junk) grade FIs (below BBB-), investment rating boundary FIs (BBB-/BBB/BBB+), and FIs that were downgraded at lag one rating. Overall, LTO has the strongest effects on downgrades *and* upgrades of speculative grade FIs.

The results in columns 1-6 show that LTO mostly has a consistent negative coefficient sign in downgrade models (except TK's LTO, column 1). Three out of 4 measures of LTO are statistically significant in downgrade models for speculative grade FIs and for lag-one

downgrade FIs, and 2 out of 4 measures are significant in upgrade models for speculative grade FIs. Moving from an ST to an LT orientation (*dummy LTO*=1) lowers the downgrade hazard of a speculative grade FI and a lag-one downgrade FI by 56.3% (column 2) and 44.2% (column 6) respectively. A one-point increase in Hofstede's LTO reduces (raises) the downgrade (upgrade) hazard of a junk grade FI by 3.6%, column 2 (1.9%, column 8), and makes a downgrade for a lag-one downgrade FI 1.2% less likely (column 6).

TABLE 5 ABOUT HERE

b. Robustness test using logit model

To test whether the effect of LTO is sensitive to a different estimation method, I estimate discrete time logit models for downgrades and upgrades in the main sample. A rating-year observation is created for each year a rating appears in the sample. Given the frequency of data availability, most of the control variables are updated annually. However, *dummy negative (positive) outlook*, *logarithm of rating age*, *return of financial sector market index*, *dummy WTO member*, *dummy prior default*, and *dummy crisis* are updated more frequently. If a rating changes during a year, a new observation is created and these variables are updated for the new rating. The sample for the logit model includes 12,606 rating-year observations.

FIs of declining credit quality are more likely to exit the sample by withdrawing from being rated. Thus, I estimate weighted logit models with weights equal to the inverse of the number of years each FI appears in the sample. The coefficient estimates of weighted logit models with Hofstede's dummies and Hofstede's numeric scores are reported in Table 6.

TABLE 6 ABOUT HERE

For downgrades, *dummy LTO/ LTO* is statistically significant and has a consistent negative coefficient size in all four weighted base and extended models (p=0 in models 2, 6, 7 and p=0.013 in model 3). The odds of being downgraded for FIs in LT-oriented societies are

0.483 times that of their peers in ST-oriented nations (extended model, column 3). For upgrades, none of the five culture values is significant in the extended logit model (9).

4.3.Potential endogeneity of culture

Two common sources of endogeneity are reverse causality and omitted variables. National culture evolves very slowly over decades or centuries (Williamson, 2000; Hofstede *et al.*, 2010), and it is *very unlikely* that rating changes affect national culture (Dang and Partington, 2020). Thus, reverse causality is *not* my concern. I address potential endogeneity of culture due to omitted variables in several ways. First, I employ the key determinants of rating changes such as *time-varying* outlook/CW and a downgrade at lag-one rating. These variables exhibit predictive ability of future rating changes.[23] Second, the extended model includes six variables that account for a nation's financial structure and legal institutions. These variables have been identified to be significant determinants of bank risk-taking behaviour.[24] Third, I conduct a two-stage residual inclusion procedure (Wooldridge, 2015) using instrumental variables (IVs) selected from relevant studies on culture. As discussed below, each IV strongly relates to a culture dimension, and thus, it meets the IV relevance requirement. Each IV is unlikely to have a direct effect on rating changes of FIs over the study period, and thus it satisfies the IV exclusion restriction.

Similar to Figlio *et al.* (2019) and Dang and Partington (2020), I employ Galor and Özak (2016)'s historical crop yield, which is the *average* potential yields within each cell (of size 5′× 5 in the world) attainable given the set of crops that are suitable for cultivation in the pre-1500 period,[25] to instrument for the variable of interest, LTO. Long-term orientation tends to develop in societies where ancestors harvested high crop yields. Thus, I expect a positive relation between *historical crop yield* and LTO.

[23] See Altman (1998), Vazza *et al.* (2005b), Bannier and Hirsch (2010), Figlewski *et al.* (2012), Dang (2018).
[24] See Barth *et al*. (1999), Demirgüç-Kunt and Detragiache (2002), Barth *et al*. (2004), Laeven and Levine (2009), Houston *et al*. (2010), Fungáčová and Weill (2013), Anginer *et al.* (2014), Berger *et al.* (2021).
[25] https://ozak.github.io/Caloric-Suitability-Index/

For the four control culture variables, the selection of IVs is based on Boubakri and Saffar (2015), El Ghoul and Zheng (2016), Dang and Partington (2020), and Berger *et al.* (2021). To instrument for PDI, I employ Davis and Abdurazokzoda (2016)'s *politeness distinction* index. The adoption of various singular pronouns in a country, captured by this index, indicates an emphasis on social stratification. Thus, I expect a positive relation between *politeness distinction* and PDI. To instrument for IDV, I use Murray and Schaller (2010)'s overall index of the historical prevalence of nine infectious diseases across regions. In societies where ancestors experienced outbreaks of pathogenic diseases, *collectivism* tends to develop and act as an "anti-pathogen defense system" (Fincher *et al.*, 2008). Thus, I anticipate a positive (negative) relation between *historical diseases* and *collectivism* (*individualism*). To instrument for MAS, I use demography measured as a nation's population in 1980. In feminine (low MAS) societies, "small is beautiful"[26] (Hofstede, 2001). Thus, I expect a positive relation between *population* and MAS. To instrument for UAI, I use the difference between the fractions of Catholics and Protestants *(religion gap)* in 1980.[27] Catholics prefer certainty, and Catholic (Protestant) societies are often characterized by a high (low) UAI score (Hofstede, 2001). Thus, I expect a positive relation between *religion gap* and UAI.

As the Cox hazard model (Cox, 1972) has no error term, I am not concerned about endogeneity due to correlations between independent variables and error term in any estimated Cox hazard model. In the following analysis, I use discrete time logit model to address potential endogeneity of culture. Since the dependent variable in the logit model in Table 6 is binary, the two-stage residual inclusion method is appropriate to address endogeneity concerns (Wooldridge, 2015). In the first-stage analysis, I regress each Hofstede's numeric value against IVs and non-culture control variables that are used in the extended specification. To account

[26] Feminine societies minimize social differences between men and women and appreciate feminine values. In feminine cultures, "small is beautiful" while in masculine cultures, "big is beautiful," Hofstede (2001).
[27] The data on population (IV for MAS) and the shares of Catholics and Protestants in 1980 (IV for UAI) is from La Porta *et al.* (1999).

for the fact that financially distressed FIs are more likely to withdraw from being rated, I estimate weighted regressions with weights equal to the inverse of the number of years each FI appears in the sample. In the second stage, I estimate discrete time logit model using first-stage fitted residuals, five Hofstede's numeric values, and the same set of control variables. I employ bootstrapping to estimate standard errors.

As the endogeneity-uncorrected weighted logit model (extended specification) for upgrades (model (9) in Table 6) does not have any significant culture variable, this two-stage analysis only focuses on downgrades. Table 7 presents the results of the two-stage logit model for downgrades. Columns (2-6) include the results of the first-stage weighted regressions. Columns (7a) and (7b) include coefficient estimates (standard errors in parentheses) of two second-stage logit models (extended specification). Column (8) includes coefficient estimates (standard errors in parentheses) of the endogeneity-uncorrected weighted logit model, as taken from model (7) in Table 6.

TABLE 7 ABOUT HERE

Overall, the coefficient sign of each IV on its corresponding culture value (underlined in columns 2-6) is as hypothesized. I conduct *F*-tests of the joint significance of the coefficients of the five IVs in the first-stage regressions. The *F*-statistics (at the foot of Table 7) are significant at the 0.01 (0.05) level in four (one) regressions. The logarithm of *historical crop yield*, the IV for LTO, is significant at the 1% level in the first-stage OLS regression where LTO is the dependent variable, and its coefficient of *positive* sign is as expected (column 6). Further, the F-statistic for this regression is 36.47, higher than the commonly used cut-off of 10, and is statistically significant at the 1% level. Adding the IVs to a model including only the control variables improves the R^2 of all five first-stage regressions, and improves the R^2 of the model in which LTO is the dependent variable from 62% to 90.8%.

The second-stage logit model (7a) includes all five fitted residuals. *Fitted residual_LTO* is *not* statistically significant, suggesting that LTO is *not* endogenous variables (as endogeneity is modelled in the error term). I then exclude this residual and re-estimate the logit model for downgrades. The result is reported in column (7b). The four remaining fitted residuals are significant, which suggests endogeneity of PDI, IDV, MAS, and UAI in the uncorrected logit model (8). The key finding is that LTO is significant at the 0.01 level (p=0), and its coefficient sign is the same in the endogeneity-corrected model (7b) and endogeneity-uncorrected model (8). Overall, the result of the two-stage analysis with IVs suggests that the significance of LTO in explaining downgrades is *unlikely* due to endogeneity.

5. Potential channels

The effect of LTO on FIs' downgrade risk is consistent across the main analysis, robustness tests and the two-stage analysis with IVs. In the following analyses, I provide empirical evidence on two potential channels through which LTO makes FIs *less* vulnerable to downgrades.

5.1. Responsible borrowing and a good payment culture

I conduct empirical analyses that examine various aspects of individuals whose risk taking behaviours affect FIs' credit risk dynamics. For this set of analyses, I use the World Value Survey (WVS) waves 2- 6.[28] As in El Ghoul *et al.* (2018)' study of zero-leverage firms across nations, I use a similar set of individual-level controls (*male dummy, log age, highest education, scaled income*) and country-level controls (*log_GDP per capita, law and order, corruption*). Definitions of control variables are given below Table 8. I regress each dependent variable (as discussed below) on LTO and control variables. Country-level controls are lagged one year relative to the survey year. Table 8 presents evidence that in LT-oriented nations (i) people exhibit a strong sense of responsibility, independence and thrift; (ii) the sense of shame

[28] WVS wave 1 ended in 1984 whereas this study starts in early 1986. Thus, wave 1 is not considered in these analyses. For WVS wave 6, I only consider surveys conducted in 2010 as 2010 is the end year of the rating data. Survey questions relevant to these analyses are *not always* included in every WVS wave.

motivates individuals to keep commitments and not take borrowed money for granted; (iii) individuals are less likely to act opportunistically and less likely to take advantage of one another; (iv) people have higher trust levels toward others and fare better in household finance.

TABLE 8 ABOUT HERE

In the first analysis, I estimate three logit models to examine the influence of LTO on three important child qualities. Three dependent dummy variables are created; each is set equal to one if survey respondents (waves 2-6) mentioned that feeling of responsibility (model (2)), independence (model (3)), thrift, saving money and things (model (4)) is an important child quality. The results show that LTO is significant at the 0.01 level and has a positive coefficient sign in all three models, as expected. Children learn best by observing and following adults' actions. To instil these values (responsibility, independence, and thrift) in their children, parents must set good examples and demonstrate these values in their daily behaviours. Further, independent people with strong savings preferences are less likely to rely on debt financing, and responsible borrowers are less likely to miss payment or go through foreclosure.

In societies with strong social capital, members who fail to comply with social norms often face negative attitudes from others (Guiso *et al.,* 2004). The social interrelatedness and collective ties in LT-oriented countries encourage people to keep promises (Hofstede *et al.*, 2010). Thus, in the second analysis, I estimate two logit models to explore the effect of LTO on one's sense of shame and one's propensity to behave properly. In model (5), the dependent dummy variable is set equal to one if survey respondents (waves 4, 5) agreed/strongly agreed that "it is humiliating to receive money without having to work for it." In model (6) the dependent dummy variable is set equal to one if survey respondents (waves 5, 6) stated that to always behave properly is "very much like me", "like me", "somewhat like me", "a little like me", and zero otherwise. As expected, LTO is significant at the 0.1 level and has a positive sign in both models. The implication is that people from LT-oriented societies are less likely to take

borrowed money for granted (model (5)). They behave properly and avoid doing things others consider wrong (for example, failing to keep promises) (model (6)). This analysis suggests a better payment culture in LT-oriented nations.

In the third analysis, I first estimate ordered probit models to examine the impact of LTO on one's propensity for opportunism. In model (7) (full sample) and model (8) (crisis sample) the dependent variable is a set of ranking states varying from 1 to 10, which is based on if survey respondents (waves 2-6) thought that "avoiding a fare on public transport" is "never justifiable" (1), "always justifiable" (10), or something in between. The probability of a higher ordered value (a higher propensity for opportunism) is estimated in models (7) and (8). There is weak evidence of a lower propensity for opportunism among people in LT-oriented nations during the study period (model (7)). The evidence is stronger during crises as LTO is significant at the 0.01 level and its negative coefficient is larger (in absolute value) in model (8), albeit with a small sample size.

Next, I examine the effect of LTO on one's tendency to make use of others. In logit model (9) the dependent dummy variable is equal to one if survey respondents (waves 4-6) thought that others would try to take advantage of them. People tend to consider the internal values that affect their behaviours when forming their expectations of others (Jiang and Lim, 2018). Thus, a response to the question "Do you think most people would try to take advantage of you if they got a chance, or would they try to be fair?" provides useful information about a respondent's tendency to make use of others. In this context, the significant (at the 0.01 level) and negative coefficient sign of LTO in model (9) suggests that people in LT-oriented nations are less likely to take advantage of others. The implication is that moral hazard concerns in bank lending relationships are less severe.

In the last analysis, I first estimate a logit model to examine one's general trust toward others. In model (10) the dependent dummy variable is equal to one if survey respondents

(waves 2-6) stated that "most people can be trusted" when asked the question "Would you say that most people can be trusted or that you need to be very careful in dealing with people?" Questions about a respondent's general trust toward others also reveal information about the respondent's trustworthiness (Glaeser *et al.*, 2000; Butler *et al.*, 2016). Trustworthy borrowers are less likely to be in debt, take excessive debt, miss payments, or default (Agarwal *et al*., 2011). High-trust individuals also accumulate a higher net worth value (Jiang and Lim, 2018). In light of this argument, I also examine household finance in model (11). The dependent dummy variable is equal to one if survey respondents (waves 3-6) reported "family savings the past year" positively ("saved money", or "got by"), and zero otherwise. As expected, LTO is significant at the 0.01 level and has a positive coefficient sign in models (10) and (11). The results suggest that individuals in LT-oriented cultures have higher trust levels toward others and they fare better in household finance.

Overall, LTO is significant in all, except model (7), and its coefficient sign in each model is as expected. The above analyses suggest that LT-oriented societies promote responsible borrowing and encourage a good payment culture. This should contribute to a lowered downgrade risk for FIs given their financial intermediary roles.

5.2.Prudent bank credit to bank deposits ratio

In LT-oriented societies, employees value job security,[29] and firms tend to offer long-term employment (Newman and Nollen, 1996). Excessive risk-taking raises bankruptcy probability, which causes detrimental effects on employees and long-term business survival. People with expertise are often a scarce resource in the financial sector. To recruit and retain talents and to serve all stakeholders and future generations, banks in LT-oriented nations have

[29] Untabulated logit regression using WVS (waves 2-5) responses that a safe job with no risk or good job security is important shows that LTO is significant at the 0.01 level and has a positive coefficient sign on job security.

to make prudent investments and conduct their business in a sustainable manner, particularly during crises when runs occur more often.[30]

The analyses in the previous section suggest less severe moral hazard concerns in lending transactions and greater opportunities to mobilise deposits, particularly long-term deposits, for FIs in LT-oriented nations. Prudent lending and solid deposits contribute to a healthy bank credit to bank deposits (BCBD) ratio. Thus, I argue that LTO is associated with a more prudent BCBD ratio.[31]

Figure 1 depicts the annual average BCBD ratios of ST- and LT-oriented countries. In most years, banks in LT-oriented nations have a lower average BCBD ratio than banks in ST-oriented nations. The mean BCBD ratio was 91.5% and 104.3% for LT- and ST-oriented countries, respectively. In an untabulated analysis, I find that the mean and median BCBDs of the two groups of nations are statistically different. Of particularly interest, the average BCBD ratio in LT-oriented countries dropped substantially, to 58.4% following the Asian financial crisis when most LT-oriented Asian nations were hard hit, and to 71.9% following the GFC.

FIGURE 1 ABOUT HERE

Next, I regress BCBD ratios on Hofstede's five culture dimensions and country-level control variables. Country-level controls capture macro-economic environment, banking industry conditions, financial structure, strength of legal system, and quality of legal enforcement. Except financial structure variables, other controls are time-varying and are lagged one year relative to BCBD ratio. The results of this analysis are given in Table 9.

TABLE 9 ABOUT HERE

There is strong evidence of statistical significance for all five culture variables. LTO/dummy LTO is significant in six models, and has a consistent coefficient sign. A high

[30] Consistent with this argument, Lievenbrück and Schmid (2014) find that LT-oriented *firms* use more hedging.
[31] This measure indicates whether a bank has sufficient liquidity to cover funding requirements, and whether a bank is able to attract and retain clients. LTO affects bank-firm relationships (Antonczyk *et al.,* 2014). Further, this ratio also reflects bank managers' flexibility in making use of its resources.

degree of LTO lowers BCBD ratio. The effect of dummy LTO on BCBD is particularly strong during crises (models (7) and (9)).

Overall, concerns of job security and a strong preference for long-term business survival encourage bank executives in LT-oriented societies to maintain a more prudent BCBD ratio, and this tendency is more pronounced during crises. A prudent BCBD ratio would contribute to improved confidence in bank deposits and lowered risk of bank runs.

6. Discussion and conclusion

This study examines whether LTO is significant in determining the hazard of rating changes of FIs over a unique period leading to the GFC during which short-termism characterised bank practices. The study period includes the Asian financial crisis and the GFC that respectively hit LT- and ST-oriented countries the hardest.

Using a sample of 1544 FIs in 50 countries, I find that LTO has more consistent and significant influences on rating downgrades than rating upgrades. Of particularly interest, its impact on downgrades is stronger during crises and more pronounced on speculative grade-rated FIs, albeit with smaller sample sizes. Switching from a short term (ST)- to a long term (LT)-oriented culture lowers the downgrade risk of an FI by 47%, a speculative-grade rated FI by 56%, and an FI of a country in crisis by 58%. The significant effect of LTO on downgrades is robust to the use of instrumental variables and various tests.

The empirical analyses at the individual level and the financial sector level reveal two possible channels through which LTO makes FIs *less* vulnerable to downgrade risk. First, LT-oriented societies promote responsible borrowing and encourage a good payment culture. Second, banks in LT-oriented countries, on average, maintain a more prudent bank credit to bank deposits (BCBD) ratio, particularly during crises.

While I cannot completely rule out potential effect(s) of managers' cultural backgrounds, this is not my key concern for three reasons. First, FIs' shareholders are typically

large institutional investors, which have capacity to monitor FIs' operations and challenge managers' unethical/ risky decision-making. Severe moral hazard problems between managers and large shareholders of FIs would affect not only FIs' reputation, their abilities to mobilise long-term funding, but also managers' job security. Second, all else being equal, managers of FIs have less flexibility in decision making than managers of non-financial firms (Dang, 2018). Third, given investors' home country bias in general and in some countries restrictions on overseas investors, it is likely that domestic shareholders and their cultural norms will be in the majority. It is very difficult for managers of FIs to make decisions which are not in line with the surrounding cultural norms. Ultimately, this is an empirical question. If the diverse culture of managers overrides that of the country of domicile then domicile LTO should not be significant.[32]

The scope of this study is somewhat limited as the information on credit rating analysts who review ratings of FIs over the study period of about 25 years is not available. While I cannot completely rule out a potential influence of an analyst's cultural background, I believe that such an influence, if it exists, is quite limited. S&P's analysts have to comply with S&P's published rating methodology and rating criteria. FIs with foreign currency-denominated debts are typically large firms which play an important role in a nation's economy. Their vital roles and the global nature of their business suggest *less* latitude for analysts to be culturally-biased. Future work might examine the effect of LTO on financial constraints and the stability of FIs using a risk measure that is independent of analyst's culture, such as changes in bankruptcy risk measures like Z-score.

The results of this study are highly relevant to investors and regulators. Managers of international fixed-income portfolios with a focus on the financial sector should tilt their portfolios toward FIs in LT-oriented countries, particularly during crises when rating

[32] Two highly relevant studies that document the effect of LTO on bank leverage (Haq *et al.,* 2018) and bank lending (Antonczyk *et al.,* 2014) also conduct a *country-level* analysis of cultural values.

downgrades and fallen angel events occur more often. As LTO exerts stronger effects during crises, incorporating LTO in international bond portfolio management helps promote responsible investing and improve market stability.

Additional analyses using World Value Surveys to examine the effects of LTO on individuals' awareness/engagements to protect the environment reveal that people in LTO cultures are more likely to show concerns for environmental pollution and are more engaged in activities that protect the environment.[33] Greater concerns about the environment, a greater ability for FIs in LTO countries to raise long-term deposits and a preference by firms for financing with bank loans (Antonczyk *et al.*, 2014) leads to an important implication. If bank regulations (for example, capital adequacy) considered a nation's LTO, banks in these countries would likely be encouraged to provide long-term debt financing to environmental/sustainability projects that benefit future generations. Moral hazards are less severe thanks to a good payment culture and prudent lending practices. These characteristics suggest that compared with their peers in ST-oriented countries, they are in a better position to cope with financial and economic shocks related to long-term climate risk. The one-size-fits-all approach underlying the BASEL III framework and ECB's climate risk stress test ignores cultural differences across countries. This study highlights national culture's relevance to credit risk management in the financial sector. The study emphasizes the need to design country-contingent prudent policies that should encourage banks to adopt long-term perspectives and focus on long-term sustainable value creation. Further, focusing on a long-term culture will reduce the risk of misconduct associated with short-termism, which will lower the risk of fines and improve bank reputation. For regulators, this will spare their scarce resources that would otherwise be spent on regulatory scrutiny.

[33] Appendix B presents the results of these additional analyses. LTO is mostly significant (at the 1% level) and has a positive coefficient sign across six estimated models

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Table 1: Statistics

Panel A: Hofstede's numeric culture scores for the full sample with OL (N = 3898)

	Mean	Median	Std dev	Min	Max
Long-term vs short-term orientation (LTO)	46.592	32	24.421	13	100
Power distance index (PDI)	47.692	40	15.532	11	104
Individualism vs collectivism (IDV)	71.781	80	22.802	12	91
Masculinity vs femininity (MAS)	59.097	62	15.776	5	110
Uncertainty avoidance index (UAI)	60.835	48	19.890	8	112

Panel B: S&P's numerical rating grades

	Hofstede full sample (with OL)	Hofstede non-US sample (with OL)	Hofstede crisis sample (with OL)
Sample size	3898	2297	1188
No of countries	46	45	28
Mean	14.37	14.31	13.81
	(Non-FIs:10.29)	(Non-FIs:11.08)	(Non-FIs: 8.79)
Median	15/ A-	15/ A-	15/ A-
	(Non-FIs:10/ BB)	(Non-FIs:11/ BB+)	(Non-FIs: 8/ B+)
Std dev	3.81	3.72	4.22
Min	2/ CC	2/ CC	2/ CC
Max	21/ AAA	21/ AAA	21/ AAA

Panel C: Rating spell duration (in years) for downgrades

	Hofstede full sample (with OL)	Hofstede non-US sample (with OL)	Hofstede crisis sample (with OL)
Sample size	3898	2297	1188
No of downgrades	1392	723	576
% downgrades	35.71%	31.48%	48.49%
	(Non-FIs: 60.85%)	(Non-FIs: 56.08%)	(Non-FIs: 46.5%)
Mean	1.66	1.62	0.65
	(Non-FIs:1.82)	(Non-FIs: 1.55)	(Non-FIs: 0.66)
Median	0.93	1.00	0.40
	(Non-FIs: 1)	(Non-FIs: 0.92)	(Non-FIs: 0.38)
Std dev	2.25	1.87	0.86
Min	0.01	0.01	0.01
Max	19.45	16.52	13.45

Panel D: Rating spell duration (in years) for upgrades

	Hofstede full sample (with OL)	Hofstede non-US sample (with OL)	Hofstede crisis sample (with OL)
Sample size	3898	2297	1188
No of upgrades	1064	657	108
% upgrades	27.30%	28.60%	9.10%
	(Non-FIs: 23.48%)	(Non-FIs: 23.1%)	(Non-FIs: 13.3%)
Mean	2.59	2.22	2.19
	(Non-FIs: 2.25)	(Non-FIs:1.99)	(Non-FIs: 1.34)
Median	1.96	1.61	1.13
	(Non-FIs: 1.74)	(Non-FIs:1.55)	(Non-FIs: 1.01)
Std dev	2.28	1.95	2.09
Min	0.04	0.04	0.12
Max	14.20	11.31	10.33

Panel A of this table reports the descriptive statistics of five Hofstede's culture scores for the full sample of FIs (with rating outlook) used to estimate extended hazard models. Panel B of this table presents the descriptive statistics of rating grades for three samples of FIs (with rating outlook): full sample, non-US sample, and crisis sample. Panels C and D present the statistics of rating spell duration (in years) for downgrades and upgrades in these three samples of FIs. The values in parentheses in Panels, B, C, and D are the corresponding values reported in Table 2, Dang (2018) for their samples of non-financial firms. For brevity reasons, the statistics presented in this Table are for the samples with Hofstede's culture values and used to estimate the extended hazard model (with non-missing values for *all* control variables).

Table 2 Stratified dynamic Cox's hazard models for the sample of FIs with rating outlook

	Hofstede's Culture Dummies				Hofstede's Numeric Scores				Universal Time Preference (UTP)				Tang & Koveos' Numeric Scores			
	Downgrade		Upgrade		Downgrade		Upgrade		Downgrade		Upgrade		Downgrade		Upgrade	
	Base	Extended	Base	Extended	Base	Extended	Base	Extended	Base	Extended	Base	Extended	Base	Extended	Base	Extended
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Hofstede (columns 6-13)/ Tang & Koveos (columns 14-17) culture scores																
Long-term vs short-term orientation (LTO) (Hazard ratio in parentheses)	NA	NA	NA	NA	**-0.012*** (0.988)	**-0.015*** (0.985)	0.0001 (0.9469)	-0.0003 (1)	NA	NA	NA	NA	**-0.008*** (0.992)	**-0.015*** (0.985)	**0.008*** (1.008)	0.004 (1.004)
Power distance index (PDI)	NA	NA	NA	NA	-0.003	0.003	0.003	0.004	-0.0043	-0.0064	0.0068**	0.008*	-0.01**	0.009	-0.002	-0.004
Individualism vs collectivism (IDV)	NA	NA	NA	NA	0.002	-0.003	0.002	0.002	0.008**	-0.0007	0.0049	0.007*	0.012**	0.006	0.008	0.003
Masculinity vs femininity (MAS)	NA	NA	NA	NA	-0.001	-0.003	0.006***	0.003	-0.0028	-0.0061**	0.005***	0.0012	-0.006**	-0.004	-0.007*	-0.007*
Uncertainty avoidance index (UAI)	NA	NA	NA	NA	0.01***	0.007*	-0.004	-0.003	0.0048	-0.001	-0.0011	0.0015	0.009**	0.008	-0.006	-0.008
Universal Time Preference (UTP)																
UTP (Hazard ratio in parentheses)	NA	NA	NA	NA	NA	NA	NA	NA	**-0.1947*** (0.823)	**-0.494*** (0.61)	**0.3421** (1.408)	**0.367** (1.443)	NA	NA	NA	NA
Hofstede's dummy variables																
Dummy long-term orientation (Hazard ratio in parentheses)	**-0.473*** (0.623)	**-0.632*** (0.531)	0.038 (1.039)	-0.111 (0.895)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dummy large power distance index	0.333**	0.641***	0.512***	0.994***	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dummy individualism	0.07	0.109	0.014	-0.074	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dummy masculine	-0.039	-0.052	0.135	0.052	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dummy strong uncertainty avoidance	-0.038	-0.229	-0.537***	-0.825***	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
S&P's rating/ Outlook																
Current rating grade	0.031**	0.032**	-0.103***	-0.1***	0.029**	0.03**	-0.101***	-0.093***	0.017	0.0287**	-0.1031***	-0.0945***	0.022*	0.027*	-0.106***	-0.102***
Junk rating boundary (BB-/BB/BB+)	0.305**	0.337***	0.049	0.072	0.299**	0.328**	0.035	0.07	0.3331***	0.3232**	0.0357	0.0663	0.335***	0.305**	-0.112	-0.1
Investment rating boundary (BBB-/BBB/BBB+)	-0.165**	-0.118	0.131*	0.125	-0.142*	-0.122	0.136*	0.142*	-0.1309*	-0.1268	0.128	0.1378*	-0.091	-0.109	0.108	0.0915
Dummy negative Outlook (time-varying)	0.934***	0.937***	-2.279***	-2.328***	0.924***	0.926***	-2.27***	-2.31***	0.9288***	0.9369***	-2.2567***	-2.2983***	0.943***	0.943***	-2.33***	-2.319***
Dummy positive Outlook (time-varying)	-4.29***	-4.274***	1.335***	1.295***	-4.282***	-4.273***	1.34***	1.299***	-4.2819***	-4.2789***	1.34***	1.2981***	-4.196***	-4.221***	1.42***	1.379***
Logarithm of rating age (time-varying)	-1.618***	-1.629***	-2.971***	-3.03***	-1.611***	-1.625***	-2.998***	-3.051***	-1.5986***	-1.621***	-2.9916***	-3.0375***	-1.583***	-1.606***	-2.741***	-2.777***
Dummy lag one downgrade	0.644***	0.626***	-0.017	0.036	0.622***	0.624***	-0.02	0.033	0.6021***	0.6243***	-0.0204	0.0276	0.596***	0.62***	0.038	0.068
Lag one rating duration	0.117***	0.116***	0.14***	0.141***	0.117***	0.117***	0.141***	0.139***	0.1212***	0.1172***	0.14***	0.1387***	0.121***	0.118***	0.131***	0.129***
Dummy prior fallen angel event(s)	-0.032	-0.007	-0.239	-0.394***	-0.024	0.023	-0.216	-0.271**	-0.053	0.0002	-0.2202*	-0.267**	0.125	0.115	-0.427***	-0.422***
Dummy large upgrade	-0.155	-0.189	-0.492***	-0.526***	-0.145	-0.174	-0.464***	-0.507***	-0.0836	-0.1772	-0.4597***	-0.497***	-0.123	-0.175	-0.499***	-0.496***
Dummy large downgrade	0.196	0.131	0.509***	0.482***	0.213*	0.144	0.513***	0.521***	0.1731	0.1067	0.496***	0.5358***	0.054	0.073	0.447***	0.487***
Rating volatility	-0.11**	-0.117**	-0.358***	-0.387***	-0.11**	-0.117**	-0.401***	-0.428***	-0.1155**	-0.1232**	-0.4077***	-0.428***	-0.113**	-0.121**	-0.313**	-0.336**

Table 2 Stratified dynamic Cox's hazard models for the sample of FIs with rating outlook (continued)

	Hofstede's Culture Dummies				Hofstede's Numeric Scores				Universal Time Preference (UTP)				Tang & Koveos' Numeric Scores			
	Downgrade		Upgrade		Downgrade		Upgrade		Downgrade		Upgrade		Downgrade		Upgrade	
	Base	Extended	Base	Extended	Base	Extended	Base	Extended	Base	Extended	Base	Extended	Base	Extended	Base	Extended
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Macro-economic conditions																
Dummy WTO member	0.023	0.129	0.33***	0.392***	0.003	0.147	0.343***	0.454***	-0.0142	0.1902*	0.4012***	0.4787***	0.186	0.231*	0.484***	0.488***
Dummy prior default	-0.145	0.433**	0.083	0.144	-0.179	0.304	0.134	0.139	-0.5534*	0.013	0.2304	0.2244	0.314	0.547	0.31	0.593**
Dummy crisis	0.643***	0.685***	-0.243**	-0.228*	0.629***	0.653***	-0.23*	-0.226*	0.6332***	0.6686***	-0.2425**	-0.2454**	0.651***	0.66***	-0.268**	-0.307**
Change in real GDP growth rate	-0.023**	-0.037***	-0.015	-0.016	-0.027**	-0.0377***	-0.017	-0.017	-0.0276**	-0.0355***	-0.0241**	-0.0217*	-0.051***	-0.048***	-0.036***	-0.031**
Change in inflation	-0.002	-0.003	-0.004	0.0005	-0.0005	0.0003	-0.003	0.002	-0.0021	-0.00005	-0.0028	0.0013	-0.012	-0.005	-0.03*	-0.024
Change in current account surplus/ GDP	-0.059***	-0.057***	-0.01	-0.014	-0.052***	-0.052***	-0.011	-0.011	-0.0494***	-0.0578***	-0.0163	-0.0134	-0.053***	-0.069***	-0.009	-0.012
Change in term trade	-0.003	0.00001	0.000007	0.000004	-0.004	0.000007	0.000005	0.000004	-0.0001	0.000003	0.000007	0.000007	0.000009	0.00001	0.000006	0.000007
Logarithm of GDP per capita	0.416***	0.515***	0.402***	0.54***	0.302***	0.546***	0.284***	0.341**	0.1857*	0.4339***	0.23**	0.2512**	0.023	0.628***	0.016	0.097
Logarithm of ratio stock market cap/GDP	-0.01	-0.111***	-0.103***	-0.154***	0.02	-0.106***	-0.079***	-0.118***	0.0279	-0.1159***	-0.0942***	-0.1134***	-0.086*	-0.182***	-0.1**	-0.102*
Return of financial sector market index	-0.248**	-0.27**	-0.076	-0.063	-0.226**	-0.232**	-0.079	-0.09	-0.2391**	-0.2635**	-0.1012	-0.1205	-0.327***	-0.307**	-0.125	-0.137
Political rights and civil liberties																
Dummy low Political rights	-10.391***	-10.666***	0.16	-0.209	-10.136***	-10.375***	0.265	0.136	-0.1677**	-0.1421*	-0.4***	-0.394***	-10.18***	-10.285***	-0.239	-0.141
Dummy high political rights	-0.177**	-0.166**	-0.311***	-0.278***	-0.169**	-0.195***	-0.343***	-0.343***	-10.3966***	-10.7032***	0.2172	0.2069	-0.245***	-0.197***	-0.379***	-0.382***
Financial structure and legal institution																
Creditor_rights	NA	0.034	NA	0.111**	NA	0.056	NA	0.078	NA	-0.0171	NA	0.0596	NA	0.024	NA	0.023
Information_sharing	NA	0.216	NA	-0.41**	NA	0.206	NA	-0.242	NA	0.3473	NA	-0.1773	NA	-0.558	NA	-0.005
Law enforcement	NA	0.064*	NA	0.048	NA	0.072*	NA	0.036	NA	0.11***	NA	0.0038	NA	0.146***	NA	0.114**
Account restrictions	NA	-0.056**	NA	0.002	NA	-0.006	NA	0.048*	NA	0.0337	NA	0.0548**	NA	0.07***	NA	0.048*
No Deposit Insurance dummy	NA	-0.493***	NA	-0.319**	NA	-0.384***	NA	-0.144	NA	-0.2634**	NA	-0.0389	NA	-0.245*	NA	0.108
Multiple Supervisors	NA	0.128	NA	0.277**	NA	0.051	NA	0.047	NA	0.1279	NA	0.0307	NA	0.193	NA	-0.363**
Number of observations	3970	3898	3970	3898	3970	3898	3970	3898	3970	3898	3970	3898	3709	3685	3709	3685
Likelihood ratio	1660.4***	1659***	1827.8***	1819.3***	1668.5***	1659.1***	1816.9***	1799.3***	1631.9***	1640.2***	1823.75***	1804.5***	1587.5***	1596.95***	1558.7***	1547.1***

This table presents the results of stratified dynamic Cox's hazard models (with time-varying covariates) for upgrades and downgrades of FIs in the samples with rating outlook. Descriptions of the independent variables are given in Appendix A. Models (2)-(5) include five Hofstede's culture dummy variables. Dummy variables take a value of one if the culture score is greater than or equal to the mean, and zero otherwise. Models (6)-(9) include five Hofstede's numeric culture scores. Models (10)-(13) employs Universal Time Preference (UTP) as an alternative measure for LTO, and four Hofstede's culture control variables. UTP was constructed based on the ten measured variables of time preferences including long-term orientation derived from World Value Survey and Future Orientation from GLOBE (see Table 1, Rieger *et al*. (2021)). More "patient" values have a positive sign and more "impatient" values have a negative sign. Models (14)-(17) include five Tang & Koveos' numeric culture scores. Tang and Koveos (2008) find that culture strongly correlates with economic development levels, and they update Hofstede's culture values based on changing economic conditions across countries. ***, ** and * represent significance at the 0.01, 0.05 and 0.10 levels respectively using the Wald test. For brevity, only the hazard ratio of the variable of interest, LTO/ dummy LTO/ UTP, is reported (in parentheses).

Table 3. Robustness analysis

	Hazard extended downgrade model						Hazard extended upgrade model			
	Model with CreditWatch		Model with *Not rated* treated as downgrades		Model without U.S. FIs		Model with CreditWatch		Model without U.S. FIs	
	Estimate	Hazard ratio	Estimate	Hazard ratio	Estimate	Hazard ratio	Estimate	Hazard ratio	Estimate	Hazard ratio
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Hofstede's culture scores										
LTO	-0.006	0.994	**-0.0116*** **	0.989	**-0.0124*** **	0.988	0.00005	1	-0.001	0.999
Control variables	Yes		Yes		Yes		Yes		Yes	
Number of observations	2127		3898		2297		2127		2297	
Likelihood ratio	1840.75***		1689.52***		965.29***		1286.44***		1375.55***	
Hofstede's dummy variables										
Dummy LTO	-0.334	0.716	**-0.4261*** **	0.653	**-0.229***	0.795	-0.1535	0.858	**-0.2518***	0.777
Control variables	Yes		Yes		Yes		Yes		Yes	
Number of observations	2127		3898		2297		2127		2297	
Likelihood ratio	1829.45***		1683.91***		953.749***		1291.18***		1385.95***	
TK's culture scores										
LTO	**-0.013** **	0.987	**-0.0108*** **	0.989	**-0.0145*** **	0.986	-0.012	0.988	-0.001	0.999
Control variables	Yes		Yes		Yes		Yes		Yes	
Number of observations	2059		3685		2084		2059		2084	
Likelihood ratio	1793.89***		1624.55***		914.833***		1210.04***		1120.23***	
Universal time preference (UTP)										
UTP	-0.0983	0.906	**-0.2619** **	0.77	**-0.4275** **	0.652	0.2799	1.323	**0.4129** **	1.511
Control variables	Yes		Yes		Yes		Yes		Yes	
Number of observations	2127		3898		2297		2127		2297	
Likelihood ratio	1839.158***		1669.03***		954.258***		1287.77***		1380.98***	

This Table presents the results of the stratified dynamic hazard extended models (with time-varying control variables) for the sample with CreditWatch (downgrade models 1, 2, and upgrade models 5, 6), the full sample (with outlook) where *Not Rated* observations were treated as downgrades at the time they leave the sample (downgrade models 3, 4), and the sample (with outlook) of non-US FIs (downgrade models 5, 6, and upgrade models 9, 10). For brevity reasons, only the parameter estimate and hazard ratio of the variable of interest, LTO/ Dummy LTO/ UTP, are presented in each model. ***, ** and * represent significance at the 0.01, 0.05 and 0.10 levels respectively using the Wald test.

Table 4: Stratified dynamic Cox's hazard extended models for the crisis sample

	Crisis sample			
	Downgrade		Upgrade	
	Estimate	Hazard ratio	Estimate	Hazard ratio
	(1)	(2)	(3)	(4)
Hofstede's culture scores				
LTO	**-0.02*** **	0.98	**0.034*** **	1.034
Control variables	Yes		Yes	
Number of observations	1188		1188	
Likelihood ratio	268.4***		189.14***	
Hofstede's culture dummy variables				
Dummy LTO	**-0.87*** **	0.419	0.983	2.672
Control variables	Yes		Yes	
Number of observations	1188		1188	
Likelihood ratio	270.38***		186.4***	
TK's culture scores				
LTO	-0.01	0.99	0.0097	1.01
Control variables	Yes		Yes	
Number of observations	1135		1135	
Likelihood ratio	259.12***		177.66***	
Universal time preference (UTP)				
UTP	**-0.88*** **	0.415	**2.508** **	12.285
Control variables	Yes		Yes	
Number of observations	1188		1188	
Likelihood ratio	259.54***		195.29***	

This table presents the results of the stratified dynamic Cox's hazard extended models (with time-varying covariates) for upgrades and downgrades of FIs (with rating outlook) during crises. Rating observations in this sample are of FIs at the time their residing countries experienced either a sovereign debt crisis or a banking crisis (*Dummy crisis*=1), as listed in Manasse *et al.* (2003), Laeven and Valencia (2008), or De Paoli *et al.* (2009). The Hofstede extended sample includes 1188 ratings of 599 FIs in 28 countries, of which 576 are downgrades and 108 are upgrades. Descriptions of the independent variables are given in Appendix A. For brevity, only the parameter estimate and hazard ratio of the variable of interest, LTO/ Dummy LTO/ UTP, is reported in each model. ***, ** and * represent significance at the 0.01, 0.05 and 0.10 levels respectively using the Wald test.

Table 5 Stratified dynamic Cox's hazard extended models for three samples of high-risk FIs

	Hazard extended downgrade model						Hazard extended upgrade model					
	Speculative rating (<BBB-) sample		Investment rating-boundary (BBB-/BBB/BBB+) sample		Lag-one downgrade sample		Speculative rating (<BBB-) sample		Investment rating-boundary (BBB-/BBB/BBB+) sample		Lag-one downgrade sample	
	Estimate	Hazard ratio	Estimate	Hazard ratio	Estimate	Hazard ratio	Estimate	Hazard ratio	Estimate	Hazard ratio	Estimate	Hazard ratio
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Hofstede's culture scores												
LTO	**-0.037*** **	0.964	-0.007	0.993	**-0.012*** **	0.988	**0.019** **	1.019	0.008	1.008	0.001	1.001
Control variables	Yes		Yes		Yes		Yes		Yes		Yes	
Number of observations	790		821		2022		790		821		2022	
Likelihood ratio	399.26***		377.95***		665.22***		396.28***		433.52***		549.32***	
Hofstede's culture dummy variables												
Dummy LT	**-0.829** **	0.437	-0.283	0.753	**-0.583*** **	0.558	0.2303	1.259	0.02	1.02	-0.288	0.75
Control variables	Yes		Yes		Yes		Yes		Yes		Yes	
Number of observations	790		821		2022		790		821		2022	
Likelihood ratio	384.83***		378.28***		669.17***		390.84***		441.45***		558.12***	
TK's culture scores												
LTO	0.0086	1.009	-0.014	0.987	-0.004	0.996	0.01691	1.017	-0.0019	0.998	0.006	1.006
Control variables	Yes		Yes		Yes		Yes		Yes		Yes	
Number of observations	640		771		1968		640		771		1968	
Likelihood ratio	330.64***		353.15***		660.77***		259.63***		392.6***		547.42***	
Universal time preference (UTP)												
UTP	**-1.931** **	0.145	-0.7119	0.491	**-0.4948*** **	0.61	**2.07*** **	7.925	0.1661	1.181	0.3057	1.358
Control variables	Yes		Yes		Yes		Yes		Yes		Yes	
Number of observations	790		821		2022		790		821		2022	
Likelihood ratio	391.5***		379.45***		657.4***		407.98***		432.69***		548.16***	

This table presents the results of stratified dynamic Cox's hazard extended models (with time-varying covariates) for upgrades and downgrades in three samples of high-risk FIs (with rating outlook). The Hofstede lag-one-downgrade extended sample includes 2022 ratings of 953 FIs in 41 countries; each observation experienced a downgrade at lag-one rating. This sample includes 982 downgrades and 370 upgrades. The Hofstede investment rating boundary extended sample consists of 821 observations rated BBB-, BBB, BBB+ of 461 FIs in 39 nations, of which there are 267 downgrades and 286 upgrades. The Hofstede speculative-grade extended sample includes 790 observations rated BB+ or below of 294 FIs in 31 countries, of which 286 are downgrades and 303 are upgrades. Descriptions of the independent variables are given in Appendix A. For brevity, only the parameter estimate and the hazard ratio of the variable of interest, LTO/ Dummy LTO/ UTP, is reported in each model. ***, ** and * represent significance at the 0.01, 0.05 and 0.10 levels respectively using the Wald test.

Table 6 Logit models for the sample of FIs with rating outlook

	Model with Hofstede's culture dummies				Model with Hofstede's culture scores			
	Downgrade		Upgrade		Downgrade		Upgrade	
	Base	Extended	Base	Extended	Base	Extended	Base	Extended
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Hofstede culture dummies (columns 2-5)/ Hofstede's culture scores (columns 6-9)								
Dummy LTO/ LTO	**-0.738*** **	**-0.727** **	0.001	-0.121	**-0.025*** **	**-0.024*** **	0.001	0.005
(odds ratio in parentheses)	(0.478)	(0.483)	(1.001)	(0.886)	(0.975)	(0.977)	(1.001)	(1.005)
Dummy large PDI/ PDI	0.768***	0.944	0.81***	0.971***	0.002	-0.003	0.006	0.009
Dummy IDV/ IDV	-0.350	-0.362	-0.081	-0.100	-0.025***	-0.023**	-0.006	0.003
Dummy MAS/ MAS	-0.067	-0.079	0.127	-0.110	0.0005	-0.0001	0.008*	-0.003
Dummy strong UAI/ UAI	-0.804***	-0.926**	-0.684***	-0.771***	-0.002	-0.002	-0.008*	-0.005
S&P's rating/ Outlook								
Current rating grade	-0.014	-0.727**	-0.148***	-0.133***	-0.017	-0.015	-0.153***	-0.132***
Junk rating boundary (BB-/BB/BB+)	0.171	-0.013	-0.004	-0.007	0.169	0.15	-0.005	-0.009
Investment rating boundary (BBB-/BBB/BBB+)	-0.259*	0.187	0.445*	0.416	-0.257*	-0.254*	0.471*	0.441*
Dummy negative Outlook	1.233***	1.232***	-1.156***	-1.208***	1.237***	1.231***	-1.147***	-1.196***
Dummy positive Outlook	-1.52***	-1.519***	2.491***	2.505***	-1.507***	-1.519***	2.538***	2.532***
Logarithm of rating age	-0.704***	-0.706***	-0.161	-0.175	-0.691***	-0.694***	-0.126	-0.15
Dummy lag one downgrade	0.972***	0.978***	-0.210	-0.139	1.018***	1.011***	-0.156	-0.118
Lag one rating duration	0.041***	0.041***	-0.041*	-0.037*	0.042***	0.041***	-0.03	-0.035
Dummy prior fallen angel event(s)	0.008	-0.010	0.413**	0.32*	0.026	0.052	0.429**	0.42**
Dummy large upgrade	-0.181*	-0.190	-0.344	-0.417**	-0.147	-0.159	-0.279	-0.386*
Dummy large downgrade	0.111	0.106	0.371**	0.383***	0.088	0.074	0.339**	0.39***
Rating volatility	-0.010	-0.011	-0.507***	-0.542***	-0.008	-0.008	-0.5***	-0.531***
Macro-economic conditions								
Dummy WTO member	0.104	0.124	0.016	0.155	-0.022	0.016	0.025	0.315*
Dummy prior default	0.162	0.331	0.310	0.442*	0.322	0.413	0.3	0.243
Dummy crisis	1.083***	1.089***	-0.967***	-0.954***	1.03***	1.027***	-1.011***	-0.989***
Change in real GDP growth rate	0.103***	0.1***	0.091***	0.087***	0.108***	0.105***	0.086***	0.086***
Change in inflation	0.078	0.077	-0.006	-0.004	0.076	0.076	-0.007	-0.004
Change in current account surplus/ GDP	-0.092*	-0.095*	0.008	0.001	-0.09*	-0.09*	-0.005	-0.0004
Change in term trade	-0.011	-0.012	0.00002***	0.00002***	-0.006	-0.007	0.00001**	0.00002**
Logarithm of GDP per capita	0.68***	0.69**	0.238	0.255	1.024***	0.813***	0.227	0.111
Logarithm of ratio stock market cap/GDP	-0.022	-0.047	-0.09*	-0.159**	0.031	0.05	-0.078	-0.162**
Return of financial sector market index	0.053	0.046	0.005	0.028	0.064	0.081	-0.028	-0.008
Political rights and civil liberties								
Dummy low political rights	-0.074	-0.066	0.007	-0.069	-0.14	-0.135	-0.072	-0.13
Dummy high political rights	0.358	0.175	1.231***	0.558***	0.435	0.36	1.165***	0.789**
Financial structure and legal institution								
Creditor_rights	NA	0.020	NA	0.272***	NA	-0.028	NA	0.226**
Information_sharing	NA	0.171	NA	-0.065	NA	0.305	NA	0.141
Law enforcement	NA	0.028	NA	0.152**	NA	0.084	NA	0.145*
Account restrictions	NA	-0.009	NA	0.079*	NA	0.015	NA	0.147***
No Deposit Insurance dummy	NA	-0.059	NA	-0.348	NA	0.056	NA	-0.023
Multiple Supervisors	NA	0.104	NA	0.049	NA	-0.229	NA	-0.188
Number of observations	12606	12606	12606	12606	12606	12606	12606	12606
Pseudo R^2	18.32%	18.35%	21.28%	21.88%	18.50%	18.56%	21.13%	21.69%

This table presents the coefficient estimates of weighted logit models (base and extended specifications) for the sample of FIs with rating outlook and Hofstede's culture values. The weight of an FI is equal to the inverse of the number of years each FI appears in the sample. Descriptions of the independent variables are given in Appendix A. Columns (2), (3), (4), (5) show the results of weighted logit models with Hofstede's culture dummies. Dummy variables take a value of one if the culture score is greater than or equal to the mean, and zero otherwise. Columns (6), (7), (8), (9) include the results of weighted logit models with Hofstede's numeric scores. The probability of a downgrade (an upgrade) according to culture is modelled in columns (2), (3), (6), (7) (columns (4), (5), (8), (9)). ***, ** and * represent significance at the 0.01, 0.05 and 0.10 levels respectively. For brevity, the intercepts and odds ratios (except for *dummy LTO/ LTO*) are not reported.

Table 7 Two-stage residual inclusion analysis

	Two-stage residual inclusion analysis							Endogeneity-uncorrected weighted logit model
	First-stage weighted regressions					Second-stage logit model		
Dependent variable	Robust standard errors (SEs) clustered at country					Bootstrap SEs		Robust SEs clustered at country
Independent variables	**(2) PDI**	**(3) IDV**	**(4) MAS**	**(5) UAI**	**(6) LTO**	**(7a) Downgrade**	**(7b) Downgrade**	**(8) Downgrade**
Instrumental variables (IVs)								
Politeness distinction (PDI: +)	**8.686*** **	-19.12***	3.767	33.115***	44.235***	NA	NA	NA
Historical diseases (IDV: -)	0.9775	-8.4303	9.2207	5.1293	-0.0199	NA	NA	NA
Historical population (MAS: +)	-0.0203	0.0793***	**0.101*** **	-0.0176	0.057**	NA	NA	NA
Religion gap (UAI: +)	0.097**	0.0532	0.0561	**0.161** **	-0.101*	NA	NA	NA
Logarithm *historical crop yield* (LTO: +)	-0.1371	-2.6427	6.147**	-4.1332	**6.079*** **	NA	NA	NA
Power distance index (PDI)	NA	NA	NA	NA	NA	0.291*** (0.0677)	0.271*** (0.061)	-0.003 (0.0126)
Individualism (IDV)	NA	NA	NA	NA	NA	-0.087*** (0.0158)	-0.097*** (0.013)	-0.023** (0.009)
Masculinity (MAS)	NA	NA	NA	NA	NA	-0.028*** (0.01)	-0.023*** (0.0081)	-0.0001 (0.0059)
Uncertainty avoidance (UAI)	NA	NA	NA	NA	NA	-0.138*** (0.0204)	-0.132*** (0.0196)	-0.002 (0.006)
Long-term orientation (LTO)	NA	NA	NA	NA	NA	**-0.018** (0.0081)**	**-0.026*** (0.0039)**	**-0.024*** (0.0064)**
Fitted residual_PDI	NA	NA	NA	NA	NA	-0.297*** (0.0365)	-0.279*** (0.0351)	NA
Fitted residual_IDV	NA	NA	NA	NA	NA	0.087*** (0.0207)	0.098*** (0.0174)	NA
Fitted residual_MAS	NA	NA	NA	NA	NA	0.038*** (0.0116)	0.032*** (0.0091)	NA
Fitted residual_UAI	NA	NA	NA	NA	NA	0.143*** (0.0271)	0.138*** (0.0254)	NA
Fitted residual_LTO	NA	NA	NA	NA	NA	-0.0104 (0.0098)	NA	NA
Control variables (extended specification)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of rating-year observations	12606	12606	12606	12606	12606	12606	12606	12606
R^2 (models with IVs)	88.33%	90.15%	53.44%	85.34%	90.83%	Pseudo R^2: 16.99%	Pseudo R^2: 16.97%	Pseudo R^2 : 18.56%
R^2 (models without IVs)	79.69%	66.01%	39.42%	42.36%	62.06%			
F statistic of IVs	24.06***	33.16***	2.94%**	56.96***	36.47***			

This Table reports the results of the two-stage residual inclusion analysis for downgrades in the sample of 12,606 rating-year observations with Hofstede's numeric scores. The expected coefficient sign of each IV on its corresponding culture variable is included in parentheses in column (1). Columns (2)-(6) include the coefficient estimates of the first-stage weighted regressions with weights equal to the inverse of the number of years each FI appears in the sample. *Fitted residual_LTO* is the residual generated from the first-stage regression where *LTO* is the dependent variable, and so on. Columns (7a) and (7b) include the results (coefficient estimates and standard errors) of the second-stage discrete time logit models (extended specification) for downgrades. Model (7a) includes all five fitted residuals whereas model (7b) excludes *Fitted residual_LTO* which is not significant in model (7a). Column (8) includes the results (coefficient estimates and standard errors) of the endogeneity-uncorrected weighted logit models (extended specification) for downgrades (as taken from column (7) in Table 6). The probability of a downgrade according to culture is modelled in models (7a), (7b), and (8). Control variables (extended specification) are included in all models but not reported for brevity. *** p-value ≤ 1%, ** 1%< p-value ≤ 5%, * 5%< p-value ≤ 10%.

Table 8. Evidence on potential channel: Responsible borrowing and better payment culture

	Important child quality:			Humiliating to receive money	Behaving properly	Avoiding a fare is justifiable		People take advantage	People can be	Family savings
	Responsibility	Independence	Thrift	w/o working for	is important	Full sample	Crises	of me	trusted	the past year
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Long-term orientation (LTO)	**0.004*** **	**0.009*** **	**0.017*** **	**0.0009***	**0.0016***	**-0.001**	**-0.017*** **	**-0.011*** **	**0.008*** **	**0.003*** **
Male dummy	-0.032**	-0.058***	-0.02	0.048***	0.053*	0 .041***	0.101***	0.116***	0.037***	0.092***
Log_age	0.128***	-0.187***	0.374***	0.376***	0.275***	-0.509***	-0.485***	-0.259***	0.335***	-0.042**
Highest Education	0.1***	0.103***	-0.07***	-0.015***	-0.029***	-0.016**	-0.015	-0.059***	0.096***	-0.026***
Scaled Income	0.022***	0.063***	-0.025***	-0.017***	0.0045	0.001	-0.019	-0.097***	0.072***	0.106***
Log_GDP per capita	0.216***	-0.00299	-0.142***	-0.43***	-0.106***	0.115***	-0.609***	0.031**	-0.046***	0.033***
Law and order	-0.026***	0.084***	-0.094***	0.162***	0.117***	-0.121***	0.626***	0.023**	0.11***	-0.043***
Corruption	-0.105***	0.111***	-0.001	-0.145***	-0.34***	-0.028	-0.558***	-0.313***	0.24***	0.126***
Intercept	-1.935***	-2.09***	-0.985***	2.965***	2.485***	NA	NA	3.105***	-4.37***	-0.07
WVS wave dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	114598	114598	114598	52932	37792	96605	8000	62992	114598	95567
Number of countries	42	42	42	33	30	41	8	37	42	40
Logit model: Max-rescaled R^2	4.70%	11.70%	7.40%	9.02%	4.91%			42.30%	9.74%	3.06%
Ordered probit model: Pseudo R^2						1.80%	4.76%			

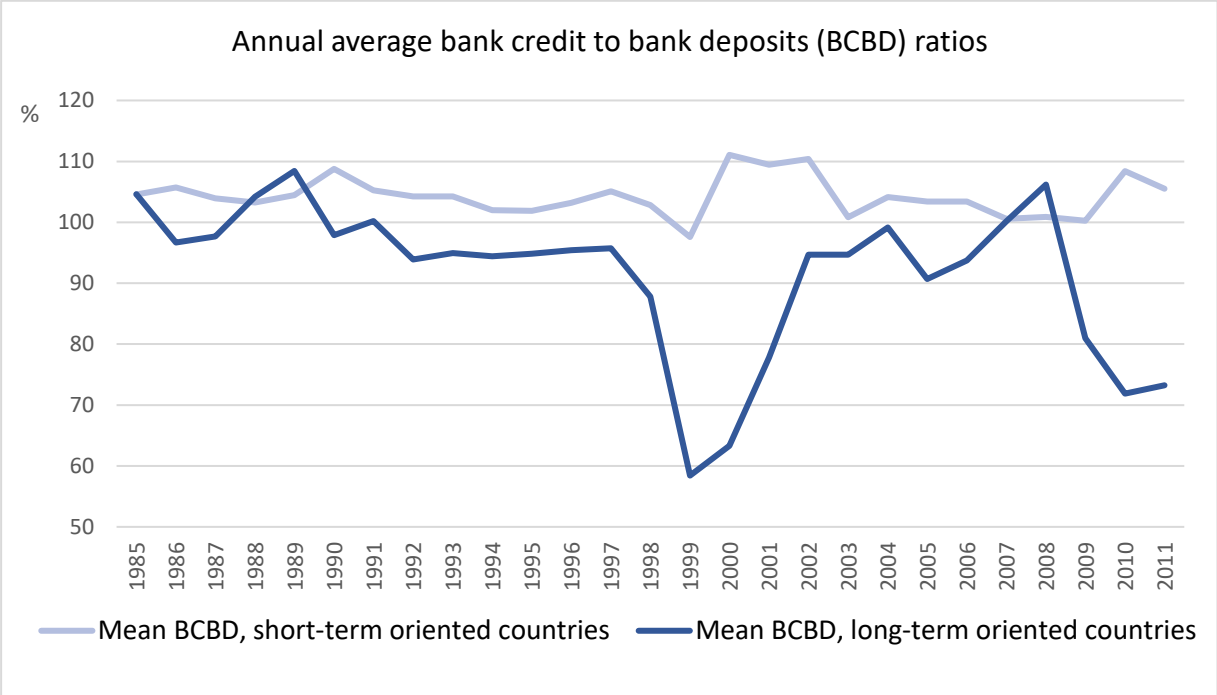
This table presents the results of additional tests for potential channels through which LTO lowers downgrade hazards of FIs. Dependent variables (as defined below) and individual-specific control variables *Male dummy, Log_age, Highest Education,* and *Scaled Income* are collected from the results of World Value Survey (WVS) waves 2-6. *Male dummy* is a dummy variable which is set equal to 1 if the respondent is male, and zero otherwise. *Log_age* is the logarithm of the respondent's age. *Highest Education* is an index that varies from 1 to 8 with a higher value indicating a higher level of education. *Scaled Income* is respondent's self-evaluated household income scaled between 1 and 10 with a higher value indicating a higher income (including all wages/ salaries, pensions, other income before taxes and deductions). Country-specific control variables *log_GDP per capita, law and order, corruption* are lagged one year relative to the survey year. *Log_GDP per capita,* as defined in Appendix A, is from World Bank database. *Law and order, corruption* are from International country risk guide (2011). The dependent variable in logit model (2), (3), (4) is a dummy variable which is set equal to 1 if survey respondents (waves 2, 3, 4, 5, 6) mentioned that feeling of responsibility, independence, thrift saving money and things is an important child quality, respectively. The dependent variable in logit model (5) is a dummy variable which is set equal to 1 if survey respondents (waves 4, 5) agreed/ strongly agreed that "It´s humiliating to receive money without having to work for it". The dependent variable in logit model (6) is a dummy variable which is set equal to 1 if survey respondents (waves 5, 6) thought that to always behave properly is "very much like me", "like me", "somewhat like me", "a little like me", and zero otherwise ("not like me", "not at all like me"). The dependent variable in ordered probit models (7) (full sample) and (8) (crisis sample) is a set of ranking states varying from 1 to 10, which is based on if survey respondents (waves 2, 3, 4, 5, 6) thought that "avoiding a fare on public transport" is "never justifiable" (1), "always justifiable" (10), or something in between. The dependent variable in logit model (9) is a dummy variable which is set equal to 1 if survey respondents (waves 4, 5, 6) thought that most people would try to take advantage of them, and zero otherwise ("most people would try to be fair" or something in between). The dependent variable in logit model (10) is a dummy variable which is set equal to 1 if survey respondents (waves 2, 3, 4, 5, 6) thought that "most people can be trusted", and zero otherwise ("need to be very careful"/ "careful"). The dependent variable in logit model (11) is a dummy variable which is set equal to 1 if survey respondents (waves 3, 4, 5, 6) reported "family savings the past year" positively ("saved money", or "got by"), and zero otherwise ("spent some savings and borrowed money"/ "spent savings" or "spent savings and borrowed money"/ "borrowed money"). *** p-value ≤ 1%, ** 1%< p-value ≤ 5%, * 5%< p-value ≤ 10%. In all models, the probability of the dependent variable having a higher value is modelled. Standard errors are clustered by country in every model.

Table 9 Evidence on potential channel: Bank credit to bank deposits

	Full sample				Crisis sample			
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Hofstede's numeric culture scores								
Long-term orientation (LTO)	-0.049	NA	-0.117	NA	**-1.315****	NA	**-1.056***	NA
Power distance index (PDI)	-0.263	NA	-0.149	NA	1.744**	NA	2.078**	NA
Individualism (IDV)	-0.24	NA	-0.073	NA	-1.4***	NA	-1.129**	NA
Masculinity (MAS)	-0.366	NA	-0.6**	NA	-1.85***	NA	-2.19***	NA
Uncertainty avoidance index (UAI)	0.482*	NA	0.53**	NA	2.441***	NA	2.62***	NA
Hofstede's culture dummies								
Dummy LTO	NA	**-16.65***	NA	**-15.89***	NA	**-96.79*****	NA	**-113.53*****
Dummy large PDI	NA	-10.635	NA	-4.471	NA	-26.51	NA	-36.794
Dummy IDV	NA	21.59**	NA	25.28***	NA	-21.105	NA	-78.239*
Dummy MAS	NA	-30.61***	NA	-30.81***	NA	-61.171*	NA	-56.44***
Dummy strong UAI	NA	27.93***	NA	26.34**	NA	74.05	NA	29.854
Time-varying control variables								
Dummy crisis	-10.737	-13.213	-14.85	-15.535	NA	NA	NA	NA
Stock market capitalisation/ GDP	0.099	0.126	NA	NA	0.111	-0.05	NA	NA
Private credit by deposit money banks/GDP	NA	NA	0.286**	0.223*	NA	NA	0.302	-0.747**
Log_GDP per capita	4.041	-1.597	2.671	-2.476	43.751*	3.774	38.669	47.402
GDP growth rate	1.262**	1.095*	1.48**	1.341**	-2.874	-1.705	-1.987	-4.455*
Inflation	-0.07***	-0.09***	-0.05**	-0.07***	-3.81***	-3.17***	-3.59***	-4.47***
Real interest rate	-0.265	-0.52***	-0.203	-0.47***	-2.771***	-3.437**	-2.758***	-4.071***
Net interest margin	-3.231	-4.2**	-2.268	-3.306*	-12.01**	-6.033	-10.67**	-14.89**
Corruption	0.901	-0.451	0.121	-0.743	-9.841	11.539	-11.05	-7.77
Law and order	0.096	1.144	-2.115	0.465	-22.267*	-29.98	-30.13**	-24.69**
Time-fixed control variables								
Information sharing	4.668	4.032	0.031	3.264	60.635**	-31.636	73.994**	-27.608
Account restriction	-1.6	-1.06	-2.075	-1.767	-15.56***	-8.116	-18.77***	-8.655
No deposit insurance dummy	24.592	16.388	20.515	12.152	-57.59***	-73.11***	-71.64***	-60.18***
Multiple supervisors	-2.759	-12.41	-3.577	-10.186	44.294	-39.346	63.575*	-7.537
Constant	72.51	117.41**	86.41	118.41**	-75.96	358.73**	-29.02	110.35
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	717	717	717	717	64	64	64	64
Number of countries	41	41	41	41	19	19	19	19
Pseudo R^2	21.22%	26.16%	25.4%	28.54%	88.04%	75.13%	88.60%	83.51%

This table reports the results of the effect of culture on bank credit to bank deposits (*BCBD*) ratio. The time series of *BCBD* for each country are available from IMF's International Financial Statistics. Macro-economic control variables are sourced from the World Bank database. *Real interest rate* is the lending interest rate adjusted for inflation as measured by the annual growth of GDP deflator. *Net interest margin* is the accounting value of banks' net interest revenues as a share of its average interest-bearing (total earning) assets. *Dummy crisis* and *Logarithm of GDP per capita* are sourced and defined as in Appendix A. *Corruption, law and order* are from International country risk guide (2011). *Information sharing, Account restriction, No deposit insurance dummy,* and *Multiple supervisors* are sourced and defined as in Appendix A. Columns (2)-(5) reports the results of the sample of 717 country-year observations. Columns (6)-(9) reports the results of the crisis sample of 64 country-year observations. Models (2), (4), (6), (8) include five Hofstede's numeric culture scores whereas models (3), (5), (7), (9) include five Hofstede's culture dummies. If the value of a country's culture dimension is greater than or equal to the mean value, the dummy is set equal to one, and vice versa. Models (2), (3), (6), (7) include *Stock market capitalisation/GDP*, a measure of stock market development. Models (4), (5), (8), (9) include *Private credit by deposit money banks/GDP*, a measure of financial intermediary sector development. Time-varying control variables are lagged one year relative to *BCBD*. I match a country's controls for 1984 (2010) to that country's *BCBD* value for 1985 (2011). Other control variables *Information sharing, Account restriction, No deposit insurance dummy,* and *Multiple supervisors* are constant during the study period. Year dummies are included in all models but not reported for brevity. *** p-value ≤ 1%, ** 1%< p-value ≤ 5%, * 5%< p-value ≤ 10%. In all models, standard errors are clustered by country.

Figure 1



This figure shows the annual average bank credit to bank deposits (BCBD) ratios of short-term and long-term oriented countries. Untabulated analysis finds that the mean and median BCBD ratios of the two groups of countries are statistically different. Short-term and long-term oriented countries have the mean BCBD ratios of 104.3% and 91.5%, respectively.

Appendix A Definitions of variables used in modelling rating changes

Variable	Definition (Sourced from Dang (2018) unless otherwise stated)	References
Culture dimensions		
Key variable of interest		
Long-term vs short-term orientation (LTO)	Long-term oriented cultures value thrift, self-discipline and focus on long-term goals and performance. Source: Hofstede *et al.* (2010), Tang and Koveos (2008)	Antonczyk *et al.* (2014), Lievenbrück and Schmid (2014), Zheng and Ashraf (2014), McKinsey Global Institute (2017), Dang (2018), Haq *et al.* (2018), Dang and Partington (2020)
Universal Time Preference (UTP)	UTP was constructed based on the ten measured variables of time preferences including long-term orientation derived from World Value Survey and Future Orientation from GLOBE. More "patient" values have a positive sign and more "impatient" values have a negative sign. Source: Rieger *et al*. (2021)).	Rieger et al. (2021)
Control culture variables	Source: Hofstede (1980), Tang and Koveos (2008)	
Power distance index (PDI)	Power distance index measures the extent to which individuals in a nation view an unequal distribution of power, roles and wealth as legitimate.	Tsakumis *et al.* (2007), Kanagaretnam *et al.*(2011), Zheng *et al.* (2012), Ashraf *et al.* (2016), Boubakri *et al.* (2017), Dang (2018), Haq *et al.* (2018), Dang and Partington (2020), Berger *et al.* (2021)
Individualism (IDV) vs collectivism	Individualism values individual accomplishment, self-orientation, autonomy and the pursuit of personal interests. Collectivism values in-group harmony and conformity to societal norms	Tsakumis *et al.* (2007), Chui *et al.* (2010), Kanagaretnam *et al.* (2011, 2014), Zheng *et al.* (2012), Li *et al.* (2013), Shao *et al.* (2013), Zheng *et al.* (2013), Ashraf *et al.* (2016), Boubakri *et al.* (2017), Tajaddini and Gholipour (2017), Dang (2018), Haq *et al.* (2018), Mourouzidou-Damtsa *et al.* (2019), Dang and Partington (2020), Berger *et al.* (2021)
Masculinity (MAS) vs. femininity	Masculinity values competitiveness, ambition and material achievement. Femininity values good working relationships, social welfare, and caring for the weak	Tsakumis *et al.* (2007), Kanagaretnam *et al.* (2011), Zheng *et al.* (2012), Zheng and Ashraf (2014), Ashraf *et al.* (2016), Dang (2018), Haq *et al.* (2018), Dang and Partington (2020), Berger *et al.* (2021).
Uncertainty avoidance index (UAI)	The uncertainty avoidance index measures the extent to which individuals in a country feel uncomfortable with uncertainty and ambiguity.	Kwok and Tadesse (2006), Tsakumis *et al.* (2007), Aggarwal and Goodell (2009), Kanagaretnam *et al.* (2011, 2014), Zheng *et al.* (2012), Li *et al.* (2013), Zheng and Ashraf (2014), Ashraf *et al.* (2016), Boubakri *et al.* (2017), Dang (2018), Haq *et al.* (2018), Dang and Partington (2020), Berger *et al.* (2021).
S&P's current rating and rating history. Source: Standard & Poor's Ratings Xpress		
Current rating grade	The current rating grade (*start rating*) of the rating observation being analysed. S&P's ratings are coded from 1 (C-) to 21 (AAA). The higher the numerical score, the better the credit quality of an entity. Ratings above BB+ (BBB- and above) are investment grade. Ratings below BBB- (BB+ and below) are speculative or junk grade.	Carty and Fons (1994), Figlewski *et al* (2012), Dang and Partington (2014), Dang (2018), Dang (2019), Dang and Partington (2020)
Investment rating boundary	This dummy takes the value of one if the current rating is in the investment grade-rated boundary, BBB-, BBB, BBB+, and zero otherwise	Carty and Fons (1994), Johnson (2004), Dang and Partington (2014), Dang (2018), Dang (2019)

Appendix A Definitions of variables used in modelling rating changes (cont.)

Variable	Definition (Sourced from Dang (2018) unless otherwise stated)	References
Junk rating boundary	This dummy takes the value of one if the current rating is in the speculative (junk) grade-rated boundary, BB-, BB, BB+, and zero otherwise	Carty and Fons (1994), Johnson (2004), Dang and Partington (2014), Dang (2018), Dang (2019)
Logarithm of age since first rated (time-varying)	*Age since first rated* measures the duration since an FI was first rated. This time-varying variable is updated whenever a rating change of interest occurs in the sample	Altman (1998), Figlewski *et al.* (2012), Dang and Partington (2014), Dang (2018), Dang (2019), Dang and Partington (2020)
Dummy lag one downgrade	This dummy takes the value of one if the rating immediately preceding the current rating ends with a downgrade, and zero otherwise	Carty & Fons (1994), Figlewski *et al.* (2012), Dang & Partington (2014), Dang (2018), Dang (2019), Dang and Partington (2020)
Lag one duration (years)	The duration of the rating immediately preceding the current rating	Carty and Fons (1994), Dang and Partington (2014), Dang (2018), Dang (2019), Dang and Partington (2020)
Dummy prior fallen angel	This dummy takes the value of one if an FI had experienced a downgrade from an investment-grade rating to a speculative-grade rating (a fallen angel event) as of the start of the current rating, and zero otherwise	Mann *et al.* (2003), Vazza, Aurora and Schneck (2005a), Güttler and Wahrenburg (2007), Dang and Partington (2014), Dang (2018), Dang and Partington (2020)
Dummy large downgrade	This dummy takes the value of one if an FI had experienced a substantial downgrade of at least three rating notches as of the beginning of the current rating, and zero otherwise	Carty and Fons (1994), Dang and Partington (2014), Dang (2018)
Dummy large upgrade	This dummy takes the value of one if an FI had experienced a substantial upgrade of at least three rating notches as of the start of the current rating, and zero otherwise	Dang and Partington (2014), Dang (2018)
Rating volatility	This measures the average number of rating regrades per year over an FI's rating history. It is calculated as the number of rating changes an FI had experienced as of the beginning of the current rating divided by *age since first rated*.	Dang and Partington (2014), Dang (2018)
S&P's rating outlook/ Credit Watch Source: Standard & Poor's Ratings Xpress		
Rating outlook indicates S&P's view regarding the potential direction of a long-term credit rating over the intermediate term (6 months-2 years) whereas Credit Watch reflects the potential direction of a long-term credit rating over a short-term period (S&P RatingsDirect, 2009). Outlooks can be positive (rating may be raised), negative (rating may be lowered), stable (rating unlikely to change), or developing (rating may be raised/ lowered)		
Dummy negative outlook (Credit Watch)	This time-varying variable takes the value of one if an FI had a negative outlook (Credit Watch), and zero otherwise.	Vazza, Leung, Alsati and Katz (2005b), Bannier and Hirsch (2010), Dang (2018), Dang (2019), Dang and Partington (2020)
Dummy positive outlook/ (Credit Watch)	This time-varying variable takes the value of one if an FI had a positive outlook (Credit Watch), and zero otherwise.	Vazza *et al.* (2005b), Bannier and Hirsch (2010), Dang (2018), Dang (2019), Dang and Partington (2020)

Appendix A Definitions of variables used in modelling rating changes (cont.)

Variable	Definition (Sourced from Dang (2018) unless otherwise stated)	References
Macro-economic conditions Source: World Bank databases unless otherwise stated		
Dummy prior default	This dummy takes the value of one if a country where an FI resides had a foreign currency-denominated debt default prior to the beginning of the current rating, and zero otherwise. Source: S&P Global Ratings' Credit Research (2013)	Mora (2006), Hill *et al.* (2010), Dang (2018), Dang and Partington (2020)
Dummy crisis	This dummy takes a value of one if a rating starts during a sovereign debt/ banking crisis as listed in Manasse *et al.* (2003), Laeven and Valencia (2008), De Paoli *et al.* (2009).	Ferri, Lui and Stiglitz (1999), Mora (2006), Dang (2018), Dang and Partington (2020)
Dummy WTO member	This dummy takes a value of one if a country where an FI resides is a member of the World Trade Organisation (WTO) at the start of the current rating, and zero otherwise.	
Logarithm of GDP per capita	The logarithm of real GDP per capita which is GDP in constant (US$ 2005) prices divided by mid-year population	Ramirez and Tadesse (2009), Zheng *et al.* (2012), Figlewski *et al.* (2012), Shao *et al.* (2013), Li *et al.* (2013), Dang and Partington (2014), Kanagaretnam *et al.* (2014), Dang (2018)
Change in real GDP growth rate	The change in the real GDP growth rate over the year prior to the start of the rating.	Ferri *et al.* (1999), Mora (2006), Hill *et al.* (2010), Shao *et al.* (2013), Dang (2018), Dang and Partington (2020)
Change in inflation	The change in the inflation rate over the year prior to the start of the rating.	Ramirez and Tadesse (2009), Zheng *et al.* (2012), Dang (2018)
Change in current account surplus/ GDP	The change in the current account surplus or deficit divided by GDP	Ferri *et al.* (1999), Mora (2006), Hill *et al.* (2010) , Dang (2018), Dang and Partington (2020)
Change in term trade	The change in terms of trade. The terms of trade effect equals capacity to imports less exports of goods and services in constant prices. Data are in constant local currency.	Dang (2018)
Logarithm of stock market capitalization/GDP	The logarithm of the ratio of stock market capitalization to GDP	Zheng *et al.* (2012), Li *et al.* (2013), Shao *et al.* (2013), Dang (2018)
Return of financial sector market index	The average return of the financial sector market index, which is calculated using daily data over a six-month rolling window prior to the rating under study. Source: Datastream	
Political rights and civil liberties Source: International Country Risk Guide (2011)		
The political risk rating comprises the scores of 12 metrics including government stability, bureaucracy quality, corruption, democratic accountability, external conflict, ethnic tensions, internal conflict, investment profile, law and order, military in politics, religion in politics, and socioeconomics conditions.		
Dummy low political rights	This dummy takes a value of one if a country's political rating score is less than or equal to 40, and zero otherwise	Dang (2018)

Appendix A Definitions of variables used in modelling rating changes (cont.)

Variable	Definition (Sourced from Dang (2018) unless otherwise stated)	References
Dummy high political rights	This dummy takes a value of one if a country's political rating score is higher than or equal to 80, and zero otherwise.	Dang (2018)
Financial structure and legal institutions		
No deposit insurance	This dummy takes a value of one if there is no explicit deposit insurance scheme and depositors were not fully compensated the last time a bank failed, and zero otherwise. Data from Demirgüç-Kunt *et al.* (2008)	Kanagaretnam *et al.* (2011), Fungáčová and Weill (2013), Anginer *et al*. (2014), Kanagaretnam *et al.* (2014), Boubakri *et al.* (2017), Haq *et al.* (2018), Berger *et al.* (2021)
Activity restrictions	This index of regulatory restrictions on the activities of banks measures the extent to which a bank can engage in securities, insurance, and real estate activities, and can own and control non-financial firms. Data from Barth *et al.* (2013)	Barth *et al*. (2004), Kanagaretnam *et al.* (2011), Boubakri *et al.* (2017), Berger *et al.* (2021)
Creditor rights	An index that aggregate creditor rights ranging between 0 and 4. Data originally from La Porta *et al.* (1999) and updated in Djankov *et al.* (2007). A higher index value indicates stronger creditor rights.	La Porta *et al*. (1999), Djankov *et al*. (2007), Houston *et al*. (2010), Kanagaretnam *et al.* (2011), Kanagaretnam *et al.* (2014), Boubakri *et al.* (2017), Haq *et al.* (2018)
Information sharing	The information sharing index that equals one if either a public registry or a private bureau operates in a country, and zero otherwise. Data from Djankov *et al.* (2007)	La Porta *et al*. (1999), Djankov *et al*. (2007), Houston *et al*. (2010), Zheng *et al.* (2013), Kanagaretnam *et al.* (2014), Mourouzidou-Damtsa *et al*. (2019)
Law enforcement	Law enforcement index ranges from 0 to 10, with higher values indicating greater law enforcement. Data from Economic Freedom of the World: 2010 Annual Report	Laeven and Levine (2009), Kanagaretnam *et al.* (2014)
Multiple supervisors	This dummy takes a value of one if multiple supervisors share responsibility for supervising a country's banks, and zero otherwise	Berger *et al.* (2021)

Appendix A lists the variables used in the base model and extended model for each migration outcome (downgrade and upgrade). The key variable of interest is long-term versus short-term orientation (LTO) established by Hofstede *et al.* (2010). The base model includes similar control variables used in Dang (2018)'s study of culture and rating changes of non-financial firms, with two exceptions (*dummy WTO member* and *return of financial sector market index*). Control variables in the base model include four Hofstede's culture dimensions (PDI, IDV, MAS, UAI), FI's *current rating grade*, rating history, rating outlook/ Credit Watch, and country-level characteristics. The extended model includes all variables in the base model and six additional time-fixed variables that capture the financial structure and legal institutions in each country. Time-varying variables (rating outlook/ Credit Watch, *age since first rated*) are updated whenever an event of interest occurs in the sample. Time-fixed rating-specific variables (the current rating and most of rating history variables) are updated at the start of a rating observation. Most country-specific variables (macro-economic conditions and political rights) are updated annually. Exceptions include *return of world stock market index, dummy WTO member, dummy prior default,* and *dummy crisis;* each is updated at the beginning of a rating observation.

Appendix B Long-term orientation, environmental risk awareness, engagement in environment causes

Dummy dependent variable	Logit model 1			Logit model 2		
	Environmental pollution most serious issue			Being active for environmental causes		
	Hofstede's LTO	TK's LTO	Universal time Preference (UTP)	Hofstede's LTO	TK's LTO	Universal time Preference (UTP)
	(2)	(3)	(4)	(5)	(6)	(7)
LTO (UTP in models 4, 7)	**0.0086*** **	**0.0189*** **	**0.3475*** **	**0.0008**	**0.0035*** **	**0.772*** **
Male dummy	0.1056***	0.0885***	0.1066***	0.0942***	0.0614***	0.0823***
Log_age	-0.0119	-0.0958**	0.00571	0.0225	0.1071***	0.0082
Highest Education	0.0649***	0.0417***	0.0642***	0.1381***	0.1379***	0.1345***
Scaled Income	0.0105	0.0176**	0.00539	0.0468***	0.0481***	0.0481***
Log_GDP per capita	0.5081***	0.4419***	0.5382***	-0.3714***	-0.4477***	-0.4397***
Law and order	0.0435	0.2108***	0.0954***	0.288***	0.5115***	0.2362***
Corruption	-0.275***	-0.4089***	-0.4221***	0.0296**	-0.1806***	-0.0859***
WVS wave dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	39124	33382	38854	95326	82181	95326
Number of countries	28	23	28	40	32	40
Logit model: Max-rescaled R^2	13.16%	14.94%	13.05%	8.06%	11.33%	9.43%
Likelihood ratio	2928.38***	2917.48***	2880.62***	4103.06***	5226.75***	4819.8***

This table presents the results of additional analyses which examine the effects of LTO/ UTP on environmental risk awareness (models 2-4), and individual engagement on environmental causes (models 5-7). Dependent variables (as defined below) and individual-specific control variables *Male dummy*, *Log_age*, *Highest Education*, and *Scaled Income* are collected from the results of World Value Survey (WVS) waves 3-6. *Male dummy* is a dummy variable which is set equal to 1 if the respondent is male, and zero otherwise. *Log_age* is the logarithm of the respondent's age. *Highest Education* is an index that varies from 1 to 8 with a higher value indicating a higher level of education. *Scaled Income* is respondent's self-evaluated household income scaled between 1 and 10 with a higher value indicating a higher income (including all wages/ salaries, pensions, other income before taxes and deductions). Country-specific control variables *log_GDP per capita, law and order, corruption* are lagged one year relative to the survey year. *Log_GDP per capita*, as defined in Appendix A, is from World Bank database. *Law and order, corruption* are from International country risk guide (2011). The dependent variable in logit models (2-4) is a dummy variable which is set equal to 1 if survey respondents (waves 5, 6) state/ indicate as the first choice that environmental polution is the most serious problem of the world. The dependent variable in logit models (5-7) is a dummy variable which is set equal to 1 if survey respondents (waves 3-6) are either members of an environmental/ conservation/ ecology organisation or attended meeting, signed petition aimed at protecting the environment over the past 12 months. In all models, the probability of the dependent variable having a higher value (1) is modelled. Standard errors are clustered by country in every model. *** p-value ≤ 1%, ** 1%< p-value ≤ 5%, * 5%< p-value ≤ 10%.