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CEO power, bank risk-taking and national culture: International evidence

Eilnaz Kashefi Pour [a], Moshfique Uddin [b,*], Victor Murinde [c], Shima Amini [b]

[a] Birmingham Business School, University of Birmingham, Birmingham B15 2TT, UK
[b] Leeds University Business School, University of Leeds, Leeds LS2 9JT, UK
[c] School of Finance and Management, SOAS University of London, London WC1H 0XG, UK

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ABSTRACT

Using unique hand-collected data for 336 large banks across 48 countries, together with values of national culture, our empirical analysis uncovers three new robust findings. First, variations of bank risk-taking across national culture and CEO power are more pronounced when cultural values and CEO power indicators are high. Second, while the individualism dimension of national culture has a moderating influence, the uncertainty avoidance dimension has a reinforcing effect, on the relationship between CEO power and bank risk-taking. In more detail, the results for the average marginal effect of CEO power on risk for different cultural values show that CEO power has a negative (positive) or insignificant impact on bank risk-taking when the value of individualism (uncertainty avoidance) is low; however, the impact becomes positive (negative) and statistically significant as the value of individualism (uncertainty avoidance) increases. Third, intra-cultural diversity matters: 'tight' cultures (e.g., strong social norms) are more pronounced than 'loose' cultures (e.g., heterogeneous values) in influencing bank risk.

1. Introduction

While understanding the broad context of company risk-taking practices is important to enhance the rigor as well as the relevance of international business (IB) research (Cavusgil et al., 2020), the integration of CEO power (Schmid et al., 2018) and national culture in cross-national studies (Prince et al., 2020) is also crucial to advancing IB research. Indeed, the literature on national culture argues that culture matters, thereby emphasizing the importance of considering the cultural context of organizational practices (Hofstede et al., 2010; Karolyi, 2016). With regard to banks, as they are inherently opaque compared to other firms, their opacity has important implications for bank risk-taking behavior (Fosu et al., 2017), and therefore the question of whether national culture can help explain the conflicting evidence regarding the effect of CEO power on bank risk-taking becomes an important one.

Recent research points to the concentration of decision-making power in a bank's CEO as a major driver of bank risk-taking behavior, making banks vulnerable (Mollah and Liljeblom, 2016). In contrast, evidence suggests that CEO power is inversely associated with bank risk-taking (Pathan, 2009). CEOs prefer less risk than shareholders and take on less risky projects to minimize the probability of losing their jobs and their professional reputations (May, 1995). Although the reported findings reinforce the persistence of managerial behavior in bank risk-taking, Delerue and Simon (2009) show that managerial perception of risk and predisposition to taking risk varies between individuals and societies. As noted by Crossland and Hambrick (2007), cross-national differences in cultural values significantly affect CEOs' decision-making and their latitudes of action, and hence there are cross-national differences in how much CEOs can affect firm performance. Therefore, it is curious whether the above conflicting results in the existing bank risk-taking literature arise from differences in national cultural environments in which managers of large banks make decisions. This curiosity is reinforced by the fact that although research on culture has gained increasing attention in economics and finance, the effect of national culture on managerial incentives remains under-explored.

Understanding the combined effects of an element of corporate governance, namely CEO power, and national culture on bank risk-taking is crucial for the global financial system, a country's competitiveness, and economic growth. While a number of single-country studies (e.g., Pathan, 2009) have examined the effects of either CEO power (e.g., Pathan, 2009) or national culture (e.g., Mourouzidou-Damtsa et al., 2019) on bank risk-taking, none of these studies has investigated the moderating effect of national culture on the effect of CEO power on bank risk-taking. In this paper, we study how CEO power, shaped by national culture, affects bank

* Corresponding author.
E-mail address: m.m.uddin@leeds.ac.uk (M. Uddin).

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risk-taking. Therefore, the key contribution of our paper is to identify national culture as a country-level variable that is linked to the effectiveness of CEO power on bank risk-taking. Our paper is positioned at the convergence of two strands of existing research. The first strand relates to bank risk-taking and CEO power, but side-steps issues associated with national culture. The second strand focuses on the relationship between bank risk-taking and national culture, but does not acknowledge the role of CEO power.[1] By examining the combined effect of national culture and CEO power on bank risk-taking in a cross-country context, we consider the unique context of each country to provide an inclusive and enhanced understanding of the effects of national culture and CEO power on bank risk-taking.

Our paper further provides an important step in integrating the contrasting literature on informal institutions and CEO power to shed new light on the effect of these two strands of research to enrich or restrain the level of bank risk-taking. Thus, the use of an institutional theoretical framework brings to the forefront the analysis of informal institutions, namely culture, and how their interactions with CEO power can affect bank risk-taking. Although very few studies report the direct effect of national culture on bank decisions (e.g., Boubakri et al., 2017; Mourouzidou-Damtsa et al., 2019), we extend that literature by investigating the indirect effects of national culture. Our study proposes that national culture influences bank risk-taking indirectly through the interaction terms between dimensions of national culture and CEO power.

Using unique hand-collected data for 336 large banks drawn from 48 countries, together with values of national culture from Hofstede, Schwartz and GLOBE, and employing a battery of empirical techniques, we uncover at least three new findings. First, we classify the sample into two dimensions of national culture (uncertainty avoidance and individualism) with a further split into high and low levels of each dimension, relative to the average; CEO power is also classified into high and low levels, relative to the average. We note from our results that two dimensions of national culture have contrasting direct impacts on bank risk-taking: Individualism is positively associated with bank risk-taking, whereas uncertainty avoidance is negatively related to it. Based on the sample splits, our new finding is that while bank risk-taking varies significantly across the two dimensions of national culture and CEO power, the variations are more pronounced when CEO power is high (relative to the average) and individualism or uncertainty avoidance dimensions of national cultures are high (relative to the average). Second, when we introduce interaction terms for national culture and CEO power, we find new evidence that national culture establishes boundary conditions for the influence of CEO power on bank risk-taking: While individualism has a moderating influence, uncertainty avoidance has a reinforcing influence, on the relationship between CEO power and bank risk-taking. Upon further inspection, using the average marginal effect of CEO power on risk for different cultural values, the results reveal that the relationship between CEO power and bank risk-taking changes depending on national cultural values. For example, CEO power has a negative or insignificant impact on bank risk-taking (measured by *sdROA*) when the values of individualism are in the range of 13–23; however, the impact becomes positive and statistically significant as the value of individualism increases. We observe a contrasting result for the uncertainty avoidance dimension, suggesting that CEO power has a positive or insignificant impact on bank risk-taking when the values of uncertainty avoidance are in the range between 0.009 and 0.027; however, the impact becomes negative and statistically significant thereafter. Third, when we disentangle national cultures into 'tight' cultures (typified by strong social norms and strict enforcement of rules) and 'loose' cultures (characterized by lax norms and heterogeneous values), we uncover a new finding that the former type of cultures is more pronounced than the latter, in the relationship with bank risk-taking.

Our results are robust after we control for the possible impact of institutional settings and legislations, and apply alternative empirical methods (including the application of hierarchical linear modeling, construction of nested samples, and use of statistical approaches to control for heteroscedasticity and potential endogeneity concerns) as well as alternative measures of national culture and bank risk-taking.

The remainder of the paper is organized as follows. The related research and hypotheses are presented in Section 2. Section 3 discusses sample selection, data and model specification. The empirical results are in Section 4, followed by the conclusion in Section 5.

2. Literature review and hypothesis development

2.1. National culture and risk-taking

North (1990) states that a combination of formal and informal institutions in a country guides individuals and organizations in dealing with uncertainty, deciphering the environment, and taking appropriate actions. He notes that national culture guides the expectations, values, and norms of a country, and thereby may underpin rapid progress or, on the contrary, may serve as an impediment to change. National culture, as informal institutions, has attracted increasing attention in the IB literature as well as related fields such as economics and finance (e.g., Beugelsdijk et al., 2017; Karolyi, 2016; Li et al., 2013). For example, it is argued that religion influences economic attitudes (Guiso et al., 2003; Hilary and Hui, 2009) and national culture dimensions affect economic outcomes (Guiso et al., 2006); moreover, cultural biases may be reflected in economic exchanges (Guiso et al., 2009). Economists have started to agree on a definition of culture and to develop a methodology to analyze its effects (Guiso et al., 2015).

In the finance literature, there is even a greater scope for studying culture as recent studies document that culture is associated with various aspects of finance such as leverage (Chui et al., 2010), dividend payments (Shao et al., 2010), earnings management (Kanagaretnam et al., 2011), mergers and acquisitions (Lim et al., 2016), debt maturity (Zheng et al., 2012), corporate risk-taking (Li et al., 2013), and bank risk-taking (Adhikari and Agrawal, 2016). Following the extensive literature on international culture (e.g., Chen et al., 2015; Li et al., 2013; Zheng et al., 2012), Hofstede's (2001), cultural dimensions offer a useful basis for linking some dimensions of culture to bank behavior. Hofstede (2001) describes five cultural dimensions, namely, individualism/collectivism, uncertainty avoidance, power distance, masculinity/femininity, and long-term/short-term orientation.[2]

Extant studies have identified uncertainty avoidance and

[1] In our study, we use the cultural dimensions for the country in which the bank is located, not those based on the CEO's nationality. While it is possible to suggest that banks run by foreign CEOs might be influenced by the CEO's national culture, which in turn may affect bank risk-taking, we adopt the view that the culture of the country in which the bank is located should matter more than the CEO's own culture (see Frijns et al., 2016 for a full discussion). However, we check our data and find that the CEO is a national of the bank's headquartering country in more than 90% of our observations. We then check our findings based on those banks with different CEO nationality. The results remain similar and are available from the authors, on request.

[2] Individualism/collectivism is related to the integration of individuals into primary groups. Uncertainty avoidance is related to the level of stress in a society. Power distance captures the different solutions to the basic problem of human inequality. Masculinity/femininity captures the division of emotional roles between men and women. Long-/short-term orientation is related to the choice of focus for people's efforts (Hofstede, 1983, 2001). Data on four cultural dimensions were generated from a survey of employees of a large multinational corporation (IBM) across over 50 countries. The World Values Survey generated data on a new calculation of long- and short-term orientation as well as data on indulgence/restraint as the sixth cultural dimension (Hofstede et al., 2010). However, these scores could be matched with 42 countries in our sample leading to have a lower number of observations.

individualism as the main cultural dimensions to influence risk-taking. For example, Li et al. (2013) provide evidence that only two of Hofstede's cultural values, uncertainty avoidance and individualism, are significantly associated with risk. A negative association is found between corporate risk-taking and uncertainty avoidance, while a positive association is reported between individualism and risk-taking (Li et al., 2013). In addition, Breuer et al. (2014) show that individualism has a significantly positive effect on risk-taking. In a similar vein, Mourouzidou-Damtsa et al. (2019) study 123 banks and find a positive association between individualism and bank risk-taking. However, their study does not consider the moderating effect of national culture on the impact of CEO power in bank risk-taking. Following the existing literature on national culture and corporate decisions, our study focuses on two Hofstede cultural dimensions, individualism and uncertainty avoidance, and studies the relationship between bank risk and CEO power. However, to test the robustness of our results we also re-estimate our analysis by adding other cultural dimensions (power distance, masculinity, long- versus short-term orientation, and indulgence versus restraint).

2.2. CEO power and risk-taking

CEO power is considered as the concentration of power in the hands of a CEO, measuring how much decision-making power is in the hands of CEOs (Adams et al., 2005). Agency theory underpins the relationship between CEO power and bank risk-taking; the conflict between shareholders and managers may arise because bank managers prefer less risk, whereas bank shareholders have reasons to prefer excessive risk in order to increase the return from the creation of assets. It is argued that bank managers' wealth consists of a portfolio of tangible, financial assets and human capital (Pathan, 2009), while shareholders can diversify their portfolio risk in the capital market (May, 1995). Managers are expected to protect their human capital by selecting safe projects or diversifying, which they can do only at the firm level (May, 1995). Nevertheless, CEOs who exercise high decision-making authority at the company level may also be able to control the shareholders and the board, signifying strong CEO power, which may directly influence their risk-taking behavior. Using a sample of 212 large US banks, Pathan (2009) finds evidence that the ability of CEOs to control board decisions (CEO power) negatively affects bank risk-taking and tends to exacerbate agency conflicts.

2.3. Individualism, CEO power, and bank risk-taking

As a starting point for the theory on individualism, CEO power and bank risk-taking, we take into consideration the argument by Hofstede (2001) that in individualistic societies the emphasis is on self-interest needs, i.e. that managers stress the importance of leadership in order to align individual tendencies. Individualism emphasizes pursuing individual needs which may not be in line with in-groups' goals (Morris et al., 1994). Managers, operating in an environment where the individualism dimension of national culture is high, are likely to be more autonomous, independent (Morris et al., 1994), underestimate the level of uncertainty in risky decisions and be more willing to make risky decisions using their own judgment (Kreiser et al., 2010).

Research in psychology relates individualistic societies to overconfidence and risk-taking behavior. For example, Heine et al. (1999) argue that individualism encourages the development of better-than-average bias. It is noted that, in more individualistic societies, such as the United States, people think positively about their abilities and the decisions made by individuals are more likely to be driven by overconfidence. In contrast, in collectivistic societies, such as Japan, people are concerned with behaving appropriately and tend to be more self-monitored (Church et al., 2006), which helps to reduce the perceptive bias caused by overconfidence (see Biais et al., 2005).

The motivations in risk-taking decisions and overconfidence bias associated with individualistic cultures are studied in the finance literature. Ferris et al. (2013) empirically find a positive relationship between individualism and the probability of CEOs to be overconfident. Gervais et al. (2011) find that overconfident managers believe that the available investment opportunities are less risky than they really are, and thus they overestimate their net present value. Individualistic societies are negatively associated with cash holding (Chen et al., 2015), positively related to firm-level corporate risk-taking (Li et al., 2013), financial risk-taking (Breuer et al., 2014), trading volume (Chui et al., 2010), investment-cash flow sensitivity (Kashefi Pour et al., 2020). In short, considering the cross-cultural psychology and finance literature, managers in individualistic cultures are more likely to engage in risky decisions.

According to psychological studies, culture shapes individual behaviors in everyday life and may help us to understand these behaviors (Hofstede, 1980). Crossland and Hambrick (2007) argue that national systems greatly shape the decision-making scope available to CEOs of companies. From the literature on CEO power, we know that more powerful CEOs are less willing to engage in risky activities (May, 1995; Mollah and Liljeblom, 2016; Pathan, 2009). In addition, this literature suggests that CEO power is a major determinant of CEO compensation (Finkelstein and Hambrick, 1989) and CEO compensation influences corporate risk-taking (Chu et al., 2020).[3] However, as in individualist societies managers tend to be overly optimistic, underestimate uncertainty (e.g., Chui et al., 2010), and engage in risky projects (see Breuer et al., 2014; Li et al., 2013), it appears plausible that individualism attenuates the negative relationship between CEO power and bank risk-taking. Therefore, we expect that in more individualistic cultures powerful CEOs to be more likely to take risky decisions, relative to those powerful CEOs in less individualistic cultures. In other words, the negative relationship between CEO power and bank risk is expected to be less pronounced in cultures high in individualism, leading to our first hypothesis:

Hypothesis 1. Individualism attenuates the negative relationship between CEO power and bank risk-taking.

2.4. Uncertainty avoidance CEO power, and bank risk-taking

Uncertainty avoidance relates to the levels of anxiety in a society. Members in cultures high in uncertainty avoidance (e.g., Greece and Germany) feel uncomfortable in unstructured situations (Hofstede, 1983). Hofstede (2001) further documents that, in ambiguous and surprising situations, people in high uncertainty-avoidance cultures take immediate actions to reduce the level of ambiguity. In a similar vein, Rieger et al. (2014) demonstrate that risk attitudes not only depend on economic conditions, but also on cultural factors, arguing that higher uncertainty avoidance leads to greater risk aversion. Managers in cultures high in uncertainty avoidance tend to avoid unpredictability and ambiguity in innovative projects, asking for higher discount rates (Li and Zahra, 2012), while those in cultures low in uncertainty avoidance are comfortable with uncertainty and ambiguity (see Li et al., 2013; Zheng et al., 2012). The psychological characteristics associated with preferred

[3] Overwhelming empirical evidence on the relationship between CEO compensation and risk-taking documents a positive relationship from compensation risk-taking incentives to corporate risk-taking (e.g., Guay (1999); Coles et al. (2006); Low (2009); Chava and Purnanandam (2010). In this vein, Lewellen (2006) examines the impact of compensation incentives on financing choices, which is a subset of the total corporate risk. On the other hand, the positive relationship between compensation risk-taking incentives and corporate risk fails in the presence of managerial career concerns (Milidonis and Stathopoulos, 2014). By contrast, Hayes et al. (2012) find no effect of executive compensation on risk-taking. Given the reported studies, managerial compensation could be a potential alternative explanation of the relationship between CEO compensation and risk-taking.

Table 1
Description of variables used in this study and corresponding data sources.

Variables	Descriptions	Sources
Risk measures:		
sdROA	The standard deviation of the return on assets (ROA) for a three-year rolling window	Authors' calculation based on Bankscope
LLP	Loan loss provision is Loan loss provision/net loans	Bankscope
Beta	Beta is estimated on a regression of daily stock returns of individual stocks in excess of 3-month T-bills against MSCI world index	Authors' calculation based on DataStream
LnZ	Insolvency risk is the natural logarithm of Z-score= [Average (returns)+Average (Equity/total assets))]/Std (Equity/total assets)	DataStream/ Bankscope
Bank variables:		
Size	Bank size is the natural logarithm of total assets at the end of each fiscal year	Bankscope
Capital	Regulatory capital is calculated as Tier 1 capital divided by risk-weighted assets	Bankscope
Deposits	Total deposits/ total assets	Bankscope
Q	Keeley's Q is the sum of the market value of equity plus the book value of liabilities divided by the book value of total assets (Keeley, 1990)	Bankscope
CEO characteristics:		
CEOpower	FollowingAdams et al. (2005), this study considers the concentration of power in the hands of a CEO. CEO Power is an index constructed by summing three binary variables: 1) if the CEO is also one of the bank's founders, one, otherwise zero; 2) if the CEO is the only insider on the board, one, otherwise zero; and 3) a dummy variable equal to one which indicates whether the CEO is, either, the chairman and the president, or, is the chairman and the bank has no president or chief operating officer (COO), otherwise zero. The sum variable is then divided by the maximum value (3) to create a proportion between zero and one which indicates the least and the most powerful CEO, respectively.	Hand collection
Overconfident	FollowingMalmendier and Tate (2008), we measure total confidence as a dummy variable equals to 1 when the number of "confident'' and "optimistic'' mentions for a CEO in the LexisNexis and The Wall Street Journal searches exceeds the number of "not confident,'' "not optimistic,'' and "reliable, cautious, practical, conservative, steady, frugal'' mentions for a CEO	Hand collection
Male	Dummy equal to 1 if the CEO is male, otherwise 0	Hand collection
International Q	Dummy equal to 1 if the CEO has international qualifications, otherwise 0	Hand collection
Internally	Dummy equal to 1 if the CEO is internally appointed, otherwise 0	Hand collection
H.Edu	Dummy equal to 1 if the CEO has a Master's degree or higher, otherwise 0	Hand collection
Ownership	The percentage of a bank's shareholdings	Hand collection
LnTenure	Natural logarithm of the number of years that a CEO is in the Board	Hand collection
Age	Age of CEOs	Hand collection
Country variables:		
IDV	Hofstede's cultural index on individualism	Hofstede (2001)
UAI	Hofstede's cultural index on uncertainty avoidance	Hofstede (2001)
H-IND	House et al.'s cultural index on individualism	House et al. (2004)
H-UAI	House et al.'s cultural index on uncertainty avoidance	House et al. (2004)
CR	Creditor rights index	Djankov et al. (2007)
CommonLaw	Dummy variable equal to 1 if a country's legal origin is common law, and 0 if the legal origin is French, German, or Scandinavian civil law	Djankov et al. (2007)
Corruption	An index ranges from 0 to 10, with larger value indicating more severe corruption	Corruption Perception Index, Transparency International
GDPgr	Annual countries' GDP growth rate	World Development Indicators, World Bank
Government Inst.	An arithmetic average of five indicators (indicators: voice, political stability, government effectiveness, regulatory quality, and rule of law)	Kaufmann et al. (2009), World Bank
Deposit Inst.	Dummy equal to one where there is explicit deposit insurance	Demirgüç-Kunt et al. (2008)

This table presents the description and source of the variables used in this study. The variables are presented in four clusters: Risk measures; bank-level variables; CEO characteristics; and country-level variables. All of the data are in US dollars. The dependent variable is Risk measures. We compute four standard measures of risk for each bank throughout the period under study on the basis of annual accounting data: the standard deviation of the return on average assets (sdROA) for a three-year rolling window (we define average assets at time t as (amount outstanding at time t + amount outstanding at time t − 1)/2), the mean of the ratio of loan loss provisions to net loans, Beta which is estimated on a regression of daily stock returns of individual stocks in excess of 3-month T-bills against MSCI world index, and the natural logarithm of Z-score (LnZ) is also used. The Z-score is [Average (returns) + Average (Equity/total assets))]/Std (Equity/total assets). However, its interpretation is different, as a high LnZ means less insolvency risk, while high sdROA and LLP indicate greater risk.

stability and risk-averse behavior in high uncertainty-avoidance cultures are evidenced in the finance literature. For example, uncertainty-avoidance cultures are associated with more cash holdings (Chen et al., 2015), lower dividend payouts, and greater corporate risk-taking (Kreiser et al., 2010; Li et al., 2013).

Taking the negative relationship between CEO power and bank risk-taking and the psychological characteristics of uncertainty-avoidance cultures, we postulate that uncertainty avoidance influences the relationship between CEO power and bank risk-taking. Because high uncertainty avoidance managers tend to be less tolerant of uncertainty and feel anxious facing uncertainty situations, it is plausible to argue that uncertainty avoidance triggers greater incentives for managers to take less risk reinforcing the negative association between CEO power and bank risk-taking. Based on the impact of the interaction between culture and CEO power on bank risk-taking, we generate a second hypothesis as follows:

Hypothesis 2. Uncertainty avoidance reinforces the negative relationship between CEO power and bank risk-taking.

3. Data and model specification

3.1. Sample and data

We study bank risk-taking variations across national culture and CEO power. Bank risk-taking considerations are more important during periods of financial crisis (Hoque et al., 2015). As such we start building our sample based on the financial crisis that began unfolding in 2007. To this end, we choose the universe of the largest 1000 banks reported in Bankscope by asset size at the end of 2006, from across the world. The financial crisis of 2007–2008, and the Great Recession of 2008 through 2012 led to the European sovereign debt crisis which peaked between

Table 2
Sample distribution, descriptive statistics for country-level and bank-level variables.

Panel A: Sample distribution

Country	No. of Banks	Percent	Bank-year Obs	Country	No. of Banks	Percent	Bank-year Obs
Australia	6	1.79%	90	Kuwait	2	0.60%	30
Austria	4	1.19%	60	Malaysia	3	0.90%	45
Bahrain	2	0.60%	30	Morocco	3	0.90%	45
Brazil	4	1.19%	60	Netherlands	2	0.60%	30
Canada	9	2.69%	135	Norway	2	0.60%	30
Chile	5	1.49%	75	Peru	1	0.30%	15
China	16	4.78%	240	Philippines	1	0.30%	15
Colombia	3	0.90%	45	Poland	9	2.69%	135
Czech Republic	1	0.30%	15	Portugal	4	1.19%	60
Denmark	3	0.90%	45	Qatar	2	0.60%	30
Finland	2	0.60%	30	Romania	1	0.30%	15
France	16	4.78%	240	Russian Federation	5	1.49%	75
Germany	6	1.79%	90	Saudi Arabia	6	1.79%	90
Greece	6	1.79%	90	Singapore	2	0.60%	30
Hong Kong	4	1.19%	60	South Africa	2	0.60%	30
Hungary	1	0.30%	15	Spain	12	3.58%	180
India	28	8.36%	420	Sweden	4	1.19%	60
Indonesia	6	1.79%	90	Switzerland	4	1.19%	60
Ireland	3	0.90%	45	Taiwan	3	0.90%	45
Israel	5	1.49%	75	Thailand	6	1.79%	90
Italy	17	5.07%	255	Turkey	8	2.39%	120
Japan	69	20.60%	1035	United Arab Emirates	6	1.79%	90
Jordan	1	0.30%	15	United Kingdom	11	3.28%	150
Korea Rep. Of	3	0.90%	45	United States	17	5.07%	255
				Total	336	100%	5025

Panel B: Descriptive statistics

	Mean	SD	Median	Min	Max
sdROA	0.19	0.14	0.14	0.03	0.48
LLP	1.37	1.30	0.88	0.17	4.40
Beta	0.39	0.36	0.29	-0.10	2.95
LnZ	3.01	0.94	3.24	1.37	4.26
Size	17.05	1.50	17.31	12.04	21.85
Capital	0.09	0.04	0.08	0.03	0.21
Deposits	0.78	0.13	0.82	0.52	0.93
Q	1.23	0.26	1.06	0.78	1.65
CEOpower	0.17	0.26	0.10	0.00	1.00
Overconfident	0.08	0.52	0.00	0.00	9.00
Male	0.97	0.18	1.00	0.00	1.00
International Q	0.21	0.40	0.00	0.00	1.00
Internally	0.63	0.48	1.00	0.00	1.00
H.Edu	0.69	0.46	1.00	0.00	1.00
Ownership	0.01	0.07	0.00	0.00	1.11
LnTenure	0.86	0.13	0.78	0.78	1.41
Age	57.10	6.38	57.00	32.00	82.00
CR	1.87	0.88	2.00	0.00	4.00
CommonLaw	0.32	0.47	0.00	0.00	1.00
Corruption	5.98	2.02	6.60	1.70	10.00
GDPgr	0.03	0.04	0.03	-0.08	0.20
Government Inst.	0.72	0.77	0.99	-1.64	1.99
IND	51.54	21.29	46.00	13.00	91.00
UAV	68.12	23.81	75.00	8.00	112.00

This table, panel A, presents the sample distribution by country. Panel B presents descriptive statistics for key variables. The data is collected for 336 banks across 48 countries between 1999 and 2013. We winsorize all firm-level variables at the one percent level in both tails of the distribution. Variables are defined in Table 1.

2010 and 2012. To study bank risk-taking during the financial and sovereign debt crises we focus on the time period between 1999 and 2013. In line with Mollah and Liljeblom (2016) and Hoque et al. (2015), our sample includes commercial, saving, cooperative, and mortgage banks. We exclude banks that were delisted after the financial crisis of 2007 because financial and stock data were not available, leaving a sample of 378 banks for which we have accounting and share price data. We have built up a unique dataset of the CEOs' characteristics of all the banks in our sample by hand-collecting these characteristics from various sources. In particular, we hand-collected data from *Thomson One*, *Nexis*, *Bloomberg*, and websites of individual banks. We also manually collected CEO biographies' data on each director's name, position (past and current), age, and degree, from *Thomson One* entries on CEO biographies. The final sample included 336 banks, for which we could hand-collect directors' information. The country-level data were collected from different sources, as described in Table 1. All of the financial data are in US dollars.[4] We describe the distribution of the sample in Table 2, Panel A. In our sample, Japan alone represents 20% (69 banks). This distribution is in line with related studies for the banking sector (e.g., Beltratti and Stulz, 2012; Hoque, 2013; Hoque et al., 2015).

Panel B summarizes the statistics for the full sample.[5] Focusing on bank and CEO characteristics, the descriptive statistics show that the mean (median) bank risk measured by *sdROA* is 19% (14%). For the natural logarithm of Z-score (*LnZ*) and the mean of the ratio of loan loss provisions to net loans (*LLP*), the mean (median) is 3.01 (3.24) and 1.37

[4] We winsorize all firm-level variables at the one percent level in both tails of a normal distribution.

[5] We report the correlation matrix in the Online Appendix Table X1.

Table 3
Mean differences across national culture and CEO power.

	IDV			UAI		
	High	Low	(High-Low)	High	Low	(High-Low)
Panel A: sdROA						
a) CEO power- high	0.210	0.175	0.020 * *	0.220	0.232	-0.012 * *
b) CEO power- low	0.160	0.159	0.001	0.240	0.235	0.005
a-b	0.050 * *	0.016 * *		-0.020 * **	-0.003	
All	0.189	0.162	0.027 * *	0.232	0.233	-0.001
Panel B: LLP						
a) CEO power- high	1.550	1.260	0.290 * **	1.270	1.437	-0.167 * **
b) CEO power- low	1.289	1.250	0.039	1.510	1.522	-0.012
a-b	0.261 * **	0.010		-0.240 * *	-0.085	
All	1.460	1.310	0.250 * *	1.430	1.453	-0.023
Panel C: Beta						
a) CEO power- high	0.482	0.468	0.014 * **	0.400	0.495	-0.095 * *
b) CEO power- low	0.450	0.444	0.006	0.412	0.411	0.001
a-b	0.032	0.024		-0.012	0.084	
All	0.465 * *	0.321 * *	0.144 * **	0.410 * *	0.462 * *	-0.052 * **
Panel D: LnZ						
a) CEO power- high	2.676	3.420	-0.744 * **	3.556	2.850	0.706 * **
b) CEO power- low	2.932	3.423	-0.491 * **	3.492	2.570	0.922 * **
a-b	-0.256 * **	-0.003		0.064 * *	0.280 * **	
All	2.777	3.473	-0.696 * **	3.421	2.680	0.741

This table presents the tests for mean differences of different measures of risk; the standard deviation of ROA (sdROA) in Panel A, loan loss provision/net loans (LLP) in Panel B, Beta which is estimated on a regression of daily stock returns of individual stocks in excess of 3-month T-bills against MSCI world index in Panel C, and natural logarithm of Z-score= [Average (returns)+Average (Equity/total assets))]/Std (Equity/total assets) (LnZ) in Panel D. The sample is classified into uncertainty avoidance and individualism (where high (low) uncertainty avoidance and individualism indicates above (below) average uncertainty avoidance- UAI- and individualism- IDV-, respectively) and CEO power (where high (low) CEO power indicates above (below) average CEO power index). All variables are defined in Table 1. * ** , * *, and * represent significance at 1%, 5%, and 10%, respectively.

(0.88), respectively. Mean (median) size is $17.50 ($17.31) billion. Tier 1 capital (*Capital*), measured by Tier 1 capital divided by risk-weighted assets is about 9% of assets. The mean (median) deposit ratios of banks are 0.78 (0.82). The mean (median) CEO power (*CEO power*) is 0.17 (0.10). 21% of CEOs have international qualifications (*International Q*) and 69% have higher education (*H.Edu*). The mean value of CEO overconfidence (*Overconfident*) is 0.08, suggesting that on average 8% of the CEOs are overconfident. 63% CEOs are internally appointed (*Internally*) and 97% are male. Correlation coefficients (Online Appendix Table X1) show that the correlation coefficients between CEO power and bank risk measures are largely consistent with our expectations. For example, the correlation coefficient between CEO power and bank risk measures (*sdROA* and *LLP*) are negative. Multicollinearity among the regressors should not be a concern as we find, but have not reported, that in a multivariate setting the average variance inflation factor (a post-estimation measure) of 1.45 suggests that multicollinearity among the regressors should not bias the coefficient estimates in the regression model. The overall results suggest bank size (*Size*) and Tier 1 capital (*Capital*) are negatively related to bank risk, while bank deposits (*Deposits*) are positively related to bank risk. For country-level variables, the results show that banks with stronger creditor rights (*CR*) and governance (*Government Inst.*) have less risk. Common law systems (*CommonLaw*), low levels of corruption (*Corruption*), and GDP growth rate (*GDPgr*) are associated with less bank risk-taking.

3.2. Model specification

We regress bank-level observations of risk-taking on variables that represent country-level cultural values, bank-level CEO power, bank characteristics, and country-level control variables. To test our Hypotheses (1 and 2), we interact cultural values and CEO power in Eq. (1). The augmented model postulates that national culture influences risk-taking by large banks indirectly through the interaction terms between dimensions of national culture and CEO power:

$$Risk_{i,t} = \alpha + \lambda_1 IDV_j + \lambda_2 UAI_j + \lambda_3 CEOpower_{i,t} + \lambda_4 IDV_j * CEOpower_{i,t} + \lambda_5 UAI_j * CEOpower_{i,t} + \sum_{k=1}^{K} \pi_k \quad Bank \quad Control_{i,t} + \sum_{k=1}^{K} \mu_k \quad CEO \quad Control_{i,t} + \sum_{k=1}^{K} \theta_k \quad Contry \quad Control_{j,t} + \eta_{i,j} \tag{1}$$

where, *Risk* is the risk measure for each bank *i* at time *t*. Following the literature on financial institutions (e.g., Barry et al., 2011; Craig and Dinger, 2013; Gaganis et al., 2019), we consider different measures of asset and default risks: the standard deviation of the return on average assets (*sdROA*)[6] and the mean of the ratio of loan loss provisions to net loans (*LLP*) within a three-year time rolling window. Following Pathan (2009), Akhigbe and Whyte (2003), and Chen et al. (2006), we use a two-factor model to estimate Beta by using a regression of daily stock returns of individual stocks in excess of 3-month T-bills against the MSCI world index.[7] We also compute default risk measured by Z-score as

[6] We define average assets at time t as (amount outstanding at time t + amount outstanding at time t − 1)/2.

[7] We have also checked the robustness of our results with respect to the estimated Beta and used a more advanced asset pricing model, the Fama-French 5-factor model. Fama and French global 5-factors are reported for only 23 countries, when we merge these countries with our own sample we get data for only 21 countries. Therefore, we have not reported the results, but are available on request.

[Average (returns) +Average (Equity/total assets))]/Std (Equity/total assets) using a three-year rolling window.[8] We use the natural logarithm of the Z-score, named (*LnZ*), to control for non-linear effects and outliers. *IDV* is the individualistic dimension of national culture and *UAI* is the uncertainty avoidance dimension of national culture, which are obtained by Hofstede (see Hofstede, 1980, 2001 for details). CEO power (*CEOpower*) is an index for CEO power – the concentration of decision-making authority in the bank's CEO. In order to measure CEO power, this study follows Adams et al. (2005) and considers the concentration of power in the hands of a CEO.[9] An index is constructed based on the three proxies of Adams et al. (2005) to measure a CEO's power. It sums up three binary variables: (i) if the CEO is also one of the bank's founders, one, otherwise zero; (ii) if the CEO is the only insider on the board, one, otherwise zero; and (iii) a dummy variable equal to one, which indicates whether the CEO is either the chairman or the president, or is the chairman and the bank has no president or chief operating officer (COO). It is expected that CEOs have more power if they are one of the founders, the only insider on the board, and play either both roles of chairman and president, or only that of chairman. The sum variable is then divided by the maximum value (3) to create a proportion between zero and one which indicates the least and the most powerful CEO, respectively.[10]

Bank Control is a vector of bank-level determinants of risk-taking according to existing literature (Haq and Heaney, 2012). We include bank size (*Size*), deposits (*Deposits*), Tier 1 capital for bank regulations (*Capital*), and charter value (*Q*) (e.g., Barry et al., 2011; Gaganis et al., 2020; Hoque, 2013; Hoque et al., 2015; Pathan, 2009). *CEO Control* represents a vector of banks' CEO traits. We use the standard set of control variables for CEOs following the executive literature (e., Hayes et al., 2012; Malmendier and Tate, 2008) including CEO age (*Age*), tenure (*LnTenure*), ownership (*Ownership*), higher education (*H.Edu*), international qualification (*International Q*), overconfidence (*Overconfident*), and gender (*Male*). *Country Control* is a vector of country control variables such as country governance (*Government Inst.*) Kaufmann et al. (2009)), corruption (*Corruption*), common law (*Common-Law*) (Djankov et al., 2007), GDP growth rate (*GDPgr*) and creditor rights (*CR*) (Li et al., 2013). For the sake of brevity, further details on the control variables are listed in Table 1. Moreover, in Eq. (1) λ_1 and λ_2 denote the coefficient for the effect of individualism and uncertainty avoidance attributes of national culture on bank risk-taking, respectively; π_k, μ_k, and θ_k denote the vector of coefficients corresponding to the vector of bank, CEO traits, and country control variables, respectively; and η is the error term which is assumed to be normally distributed. Generalized least square (GLS) is used to estimate Equations (2) and (3). As shown by Pathan (2009) and Chen et al. (2015), fixed effect estimation is not suitable for this type of specification because some time-invariant variables are included. The fixed effect estimation requires variables to vary over time to produce an efficient outcome. However, some of the variables on the right-hand side do not vary much over time (e.g., founder, age, and insider) or even not at all (e.g., cultural index).

[8] The use of a 3-year rolling time window is consistent with many other studies (e.g., Doumpos et al. (2015); Fang et al. (2014); Gaganis et al., (2019, 2020). To further check the robustness of our results, we also use a 5-year rolling time window in our analyses, where the results remain consistent. For brevity, the results are not reported but are available, on request.

[9] Finkelstein (1992) identified four sources of power: structural, ownership, expert, and prestige power. However, Adams et al. (2005) measure CEO power in terms of how much decision-making power is in the hands of CEOs.

[10] Finkelstein (1992) identified four sources of power: structural, ownership, expert, and prestige power. However, Adams et al. (2005) measure CEO power in terms of how much decision-making power is in the hands of CEOs. Furthermore, the CEO Power measure does not deal with issues such as CEO perquisites and board compensation, because they are only tangential to the foregoing discussion.

4. Results

4.1. Bank risk-taking across national culture and CEO power

Table 3 reports how bank risk-taking varies across national culture and CEO power. The sample is classified into two dimensions of national culture (uncertainty avoidance and individualism) with a further split into high and low, relative to the average. CEO power is also classified into high and low, relative to the average. The test results for differences in means using the *t*-test are also reported. It is shown that the standard deviation of return on average assets (*sdROA, Panel A*), the mean of the ratio of loan loss provisions to net loans (*LLP, Panel B*), Beta (*Beta, Panel C*), and the natural logarithm of Z-score (*LnZ, Panel D*) are significantly higher in cultures high in individualism compared to those in low individualistic societies. In contrast, the average of all risk measures, except Panel B, is significantly lower in cultures high in uncertainty avoidance relative to those in societies low in uncertainty avoidance. These results are consistent with Li et al. (2013) who suggest that cultures high in uncertainty avoidance avoid ambiguity and prefer less risk, while cultures high in individualism take higher risks.

Table 3 also shows that the distribution of bank risk-taking is not homogeneous between CEOs with high power and those with low power. Considering the individualism dimension of national culture, bank risk-taking (across different measures, *Panels A-D*) is greater when CEO power is high. However, these differences are larger and more pronounced when cultures are high in individualism. In high uncertainty avoidance societies, the results show that bank risk-taking is significantly lower when CEO power is high; the results are less pronounced when uncertainty avoidance is low.

The overall results suggest that bank risk-taking varies significantly across the two dimensions of national culture (*UAI* and *IND*) and CEO power. The variations are more pronounced when CEO power is high (relative to the average) and cultures are high (relative to the average) in individualism or uncertainty avoidance.

4.2. Interaction between CEO power and national culture

Table 4 (Panel A) presents the estimation results using Generalized Least Square (GLS) random effects for Eq. (1). Consistent with the predictions of this study, bank risk-taking is higher in individualistic societies and lower in countries with high uncertainty avoidance (Models 1–4). To check the robustness of our results, in Models (5−8), we add Hofstede's four other cultural values (Power Distance,[11] *PD*, Masculinity, *MAS,* long versus short-term orientation, *L. Orientation*, and indulgence versus restraint, *Indulgence*) to our model in Eq. (1).[12] The results are generally consistent with those reported in Models 1–4, with respect to the positive association between individualism and bank risk-taking and the inverse relationship between uncertainty avoidance and bank risk-taking.[13] We also find similar qualitative results for other control variables. The results are largely significant across all three measures of risk, which are *sdROA* (Model 1), *LLP* (Model 2), *Beta* (Model 3), and also *LnZ* (Model 4) after controlling for bank-level and country-level variables. The Wald Chi-square across all models is statistically significant. In Models 4 and 8, a high *LnZ* means less insolvency risk, while *sdROA, LLP,* and *Beta* (Models 1–7) show more risk. Therefore, the results for *LnZ* (Models 4 and 8) should be interpreted inversely. These results are consistent with those on corporate risk-taking by Li et al. (2013), who

[11] Gaganis et al. (2019) document a negative relationship between power distance and insurance firm risk.

[12] However, these scores could be matched with 42 countries in our sample leading to have a lower number of observations.

[13] We included the cultural variables one at a time in the regression model and found that this approach does not change the significant association with bank risk-taking. The results are available from the authors, on request.

Table 4
GLS Random effects regression results for bank risk-taking.

	Panel A: GLS Random effects regression								
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Sign	sdROA	LLP	Beta	LnZ	sdROA	LLP	Beta	LnZ
IDV	+	0.028 * **	0.090 * *	0.058 * **	-0.097 * **	0.085 * **	0.041 * *	0.094 * *	-0.178 * **
		(5.26)	(2.10)	(4.99)	(−5.57)	(4.14)	(2.17)	(2.04)	(−5.07)
UAI	-	-0.015 * **	-0.162 *	-0.107 * **	0.110 * *	-0.016 * **	-0.180 *	-0.091 * **	0.103 * *
		(−4.89)	(−1.69)	(−2.85)	(2.23)	(−5.35)	(−1.78)	(−3.04)	(2.18)
CEOpower	-	-0.012 * **	-0.011 * *	-0.044 * **	0.130 * **	-0.022 * **	-0.068	-0.024 * *	0.025 * *
		(−6.12)	(−2.19)	(−3.07)	(2.50)	(−5.93)	(−1.51)	(−1.99)	(2.07)
CEOpower*IDV	+	0.017 * **	0.514 *	0.073 * *	-0.207 * **	0.030 * **	0.469 *	0.040 * *	-0.197 * **
		(4.99)	(1.87)	(2.01)	(−3.67)	(4.43)	(1.74)	(2.31)	(−3.52)
CEOpower*UAI	-	-0.015 * **	-0.099 * *	-0.054 * *	0.063 * *	-0.017 * **	-0.036 * *	-0.008 * *	0.103 *
		(−4.57)	(−2.39)	(−2.40)	(2.15)	(−5.14)	(−2.14)	(−2.10)	(1.95)
Overconfident	+	0.027 * *	1.279 * *	0.047 * **	-0.098	0.023 *	0.985	-0.002	-0.118
		(2.01)	(2.04)	(3.45)	(−0.25)	(1.81)	(0.82)	(−1.12)	(−0.32)
Male	+	0.082	1.394	0.038	-0.304 * **	0.053	2.232	-0.121 *	-0.229 * **
		(0.78)	(0.15)	(0.22)	(−4.25)	(0.51)	(0.24)	(−1.92)	(−3.26)
International Q	+	0.046	2.701	0.018	0.584	0.021	3.015	0.082 *	-1.065 *
		(1.29)	(0.92)	(0.87)	(0.90)	(0.59)	(1.02)	(1.953	(−1.65)
Internally	-	-0.000	-0.057 * **	-0.041 *	0.246 * *	0.005	-0.388 * **	0.072 * **	0.564 * **
		(−0.01)	(−2.64)	(−1.85)	(2.45)	(0.18)	(−3.19)	(2.56)	(3.13)
H.Edu	-	-0.050 * *	-0.282	-0.045 *	0.398 * **	-0.051 * *	-3.332 *	0.020	-0.566
		(−2.14)	(−1.62)	(−1.83)	(2.99)	(−2.26)	(−1.66)	(0.32)	(−1.26)
Ownership	-/+	-0.294 * **	0.635	-0.017	0.937 * **	-0.136 * **	0.692	0.042	0.609 * **
		(−5.88)	(1.39)	(−0.18)	(4.53)	(−5.67)	(1.43)	(1.11)	(3.25)
LnTenure	-	-0.159 * *	1.100	-0.044	0.842 * **	-0.145 * *	-1.313	0.132	0.082 * *
		(−2.58)	(0.04)	(−1.05)	(2.69)	(−2.47)	(−1.33)	(1.05)	(2.26)
Age	-	-0.001 *	-0.003	-0.004 * **	0.068 * *	-0.001 * *	-0.011 * *	-0.017 * **	-0.015
		(−1.87)	(−2.02)	(−3.24)	(1.99)	(−2.08)	(−2.06)	(−4.88)	(−0.43)
Size	-	-0.040 * *	-0.259 * **	-0.501 * **	0.160 * **	-0.044 * **	-0.197 * *	0.124 * **	0.017 * **
		(−2.55)	(−3.74)	(−12.10)	(6.58)	(−2.63)	(−2.25)	(8.45)	(4.11)
Capital	-	-0.752 *	-0.631 * **	-1.152 * *	0.421 * **	-0.804 *	-0.561 * **	-0.022 * **	0.358 * **
		(−1.67)	(−5.20)	(−2.18)	(11.18)	(−1.71)	(−6.15)	(−5.56)	(8.14)
Deposits	+	0.046 * **	0.146 * *	0.020 *	-1.260 * **	0.047 * **	0.056	0.985 * **	-1.369 * **
		(3.44)	(2.14)	(1.92)	(−5.10)	(3.52)	(0.05)	(8.28)	(−5.32)
Q	-	0.007	-0.064 * *	-0.058 * **	0.168 * **	-0.027	-0.662	-0.010	0.796 * **
		(0.11)	(−2.31)	(−2.87)	(7.67)	(−0.46)	(−1.45)	(−1.06)	(7.51)
CR	-	-0.018 *	-0.343 * **	-0.012 * **	0.456	-0.013 *	-0.067 * *	-0.009	0.080 *
		(−1.90)	(−5.95)	(−3.04)	(2.26)	(−1.88)	(−2.41)	(−1.10)	(1.71)
CommonLaw	-	-0.134 * *	-0.052 * *	-0.080	-0.973	-0.184 * **	0.955	-0.038	-0.540
		(−2.45)	(−2.12)	(−1.43)	(−1.18)	(−3.32)	(0.66)	(−0.45)	(1.00)
Corruption	+	0.040 * **	0.326 * **	0.014 * **	-0.374 * **	0.049 * **	0.268 * **	0.018	-0.504 * **
		(4.15)	(3.19)	(3.35)	(−8.67)	(4.33)	(2.75)	(1.01)	(−8.46)
GDPgr	-/+	-0.079	-0.065	-0.004	-0.225	-0.057	-0.379	0.108 * **	-0.384
		(−1.10)	(−1.35)	(−1.23)	(−1.54)	(−1.43)	(−1.39)	(6.92)	(0.71)
Government Inst.		-	-0.001	-0.260	-1.052	-0.196	0.004	0.222	-1.021 * *
		(−0.22)	(−0.49)	(−1.07)	(−1.56)	(0.71)	(0.42)	(−1.98)	(−2.10)
PD	+ /-					0.007	1.292	0.010	-0.161
						(1.62)	(0.68)	(1.25)	(−1.53)
MAS	+ /-					-0.001	-0.008	-0.025	0.262
						(−0.21)	(−0.04)	(−1.00)	(1.06)
L. Orientation	+ /-					-0.089	-0.482 *	-0.085	0.980
						(−1.00)	(−1.93)	(−1.51)	(1.08)
Indulgence	+ /-					-0.002	0.763	-0.008	0.216
						(−0.95)	(0.05)	(−1.08)	(1.03)
Constant		-1.166 * **	-1.988	1.050 * **	1.521 * *	-0.719 *	-0.877 * *	0.087 *	0.807
		(−3.56)	(−1.21)	(6.88)	(2.57)	(−1.73)	(−2.19)	(1.80)	(1.63)
Wald-Chi2		1252.08 * **	1368.00 * **	1871.54 * **	1253.25 * **	1020.32 * **	1252.30 * **	1005.32 * *	1100.25 * **
R-squared		0.32	0.34	0.32	0.25	0.13	0.10	0.28	0.16
N		5025	5025	5025	5025	4065	4065	4065	4065
Panel B: Average marginal effects									
Individualism									
		sdROA		LLP		Beta		LnZ	
c		dy/dx at IND = *c*	Delta-method STD.error	dy/dx at IND = *c*	Delta-method STD.error	dy/dx at IND = *c*	Delta-method STD.error	dy/dx at IND = *c*	Delta-method STD.error
13		-0.000	0.058	-0.140	0.001	-0.022	0.013	0.057	0.024
23		0.001	0.047	-0.147	0.034	-0.021	0.012	0.041	0.011
33		0.007 *	0.038	-0.055	0.008	0.010	0.012	-0.024	0.081
43		0.009 * *	0.030	0.163 *	0.065	0.033 * *	0.011	-0.108 *	0.066
53		0.015 * *	0.026	0.230 *	0.089	0.048 *	0.010	-0.192 *	0.059
63		0.017 *	0.027	0.302 * *	0.056	0.051 * *	0.013	-0.276 * *	0.063
73		0.017 * **	0.033	0.415 * **	0.034	0.053 * **	0.010	-0.300 * **	0.076
83		0.021 * **	0.042	0.507 * *	0.028	0.064 *	0.014	-0.344 * **	0.095

(*continued on next page*)

Table 4 (*continued*)

	Panel A: GLS Random effects regression								
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
93	0.029 * *	0.052	0.799 * *	0.080	0.068 * *	0.025	-0.428 * *	0.017	
	Uncertainty avoidance								
	sdROA		LLP		Beta			LnZ	
c	dy/dx at IND = *c*	Delta-method STD.error	dy/dx at IND = *c*	Delta-method STD.error	dy/dx at IND = c	Delta-method STD.error	dy/dx at IND = *c*	Delta-method STD.error	
8	-0.009	0.072	0.022	0.046	-0.002	0.020	0.001	0.159	
18	-0.002	0.061	0.022	0.065	-0.018	0.010	0.004	0.135	
28	-0.005	0.050	-0.040 * *	0.021	-0.031	0.011	0.008 * *	0.112	
38	-0.008 * *	0.040	-0.044 * *	0.064	-0.052 * *	0.010	0.022 * **	0.090	
48	-0.011 * *	0.031	-0.051 * **	0.084	-0.058 *	0.010	0.025 * *	0.072	
58	-0.014 * *	0.025	-0.055 * **	0.019	-0.065 * *	0.011	0.029	0.060	
68	-0.014 * **	0.025	-0.062 * *	0.058	-0.073 * **	0.010	0.032 * *	0.057	
78	-0.020 * **	0.029	-0.069 * **	0.033	-0.074 *	0.014	0.036 * **	0.065	
88	-0.021 * **	0.037	-0.077 * **	0.067	-0.098 * *	0.020	0.050 * *	0.081	
98	-0.021 * **	0.047	-0.087 * *	0.080	-0.102 * *	0.020	0.063 * *	0.101	
108	-0.025 * **	0.058	-0.098 * *	0.033	-0.121 * *	0.018	0.097 * *	0.104	
118	-0.027 * *	0.069	-0.105 * *	0.017	0.147 * *	0.018	0.081 * **	0.107	

Panel A of this table presents the results for the generalized least squares random effect (GLS RE) in Panel A. Models 1–4 present the results for the interaction between cultural value and CEO power after adding power distance (PD) and masculinity (MAS) scores using Eq. (1). Models 5–8 present the results for the interaction between cultural value and CEO power after adding power distance (PD), masculinity (MAS), long-term orientation (L.Orientation), and indulgence scores. The risk measure as the dependant variable is the standard deviation of ROA (sdROA) in Models 1 and 5, loan loss provision/net loans (LLP) in Models 2 and 6, Beta which is estimated on a regression of daily stock returns of individual stocks in excess of 3-month T-bills against MSCI world index in Models 3 and 7, and the natural logarithm of Z-score= [Average (returns)+Average (Equity/total assets))]/Std (Equity/total assets) (LnZ) in Models 4 and 8. All variables are defined in Table 1. Between R-squared (R-squared), Wald test (Wald-Chi2) and F-statistics are reported. Year dummies are included in all models. N is the number of observations. The figures in parentheses are t-statistics. Panel B shows the results for the marginal effects of Eq. (1) with standard errors obtained by the Delta method. The first column (c) reports the 10 and 12 values of individualism and uncertainty avoidance covariate, respectively, in the range of 13–93 for individualism and 8–118 for uncertainty avoidance observed in the sample. Columns 2, 4, and 6 report the values of the marginal effects of CEO power (CEOpower) on bank risk-taking given the constant reported in the same row of the first column. The figures in parentheses are t-statistics. * ** , * *, and * represent significance at 1%, 5%, and 10%, respectively.

find that individualism (*IDV*) has a positive effect, whereas uncertainty avoidance (*UAI*) has a negative impact on corporate risk-taking. The economic significance of cultural values on bank risk-taking is also important. For example, in Model (1), an increase in individualism by one standard deviation (i.e. using Table 2, an increase in *IDV* of 21.29 points) would increase bank risk measured by *sdROA* (in logarithmic form) by approximately 5% points ((ln(21.29)* (0.028)/ln(0.19)= 0.05, where 21.29 is the standard deviation of *IDV* and 0.19 is the average of *sdROA*). These results are also economically significant for all measures of risk. In addition, an increase in uncertainty avoidance by one standard deviation (i.e. using Table 2, an increase in *UAI* of 23.81 points) would increase risk measured by *sdROA* (in logarithmic form) by approximately 3% points ((ln(23.81)* (0.015)/ln(0.19)= 0.03, where 23.81 is the standard deviation of *UAV* and 0.19 is the average of *sdROA*).

The coefficient on CEO power is significant and with the predicted sign, except in Model 6 when *LLP* is considered as a proxy for bank risk including all six cultural dimensions. More especially, in Model (1), an increase in CEO power by one standard deviation would reduce bank risk (*sdROA*, in logarithmic form) by approximately 1% point ((ln(0.26) * (0.012)/ln(0.19)= 0.01, where 23.81 is the standard deviation of *UAV* and 0.19 is the average of *sdROA*). The results are consistent with Pathan (2009), who finds that CEO power is associated with lower bank risk in the US.

Considering the results relating to the relationship between the interaction term (for CEO power and individualism dimension of national culture, i.e. *CEOpower*IDV*) and bank risk-taking, interestingly the results show a positive relationship between the interaction term and different measures of bank risk-taking, which is consistent with our first hypothesis. It is shown that although bank risk-taking is negatively associated with CEO power on its own, this relationship is reversed for *CEOpower*IDV*, suggesting that the negative effect of CEO power is less pronounced in individualistic countries. Managers in individualistic societies believe that they are more skilled and have a higher level of outcome control (Li et al., 2013; Yamaguchi et al., 2005), and hence banks with powerful CEOs in individualistic societies are relatively exposed to more risk compared to those in collectivistic societies. In the interaction between CEO power and the individualistic culture environment in which the bank CEOs are operating, the effect of the latter outweighs the effect of the former such that the overall effect on bank risk-taking is positive. These results are consistent across all measures of bank risk. Considering Model (1), the economic significance of the results indicates that an increase in the interaction term between individualism and CEO power (*CEOpower*IDV*) by one standard deviation would increase bank risk measured by *sdROA* (in logarithmic form) by approximately 4% points (ln(44.31)* (0.017)/ln(0.19)= 0.04, where 44.31 is the standard deviation of *CEOpower*IDV* and 0.19 is the average of *sdROA*).

The results for the interaction term between the uncertainty avoidance dimension of national culture and CEO power (i.e., *CEOpower*UAI*) are negatively significant in all bank risk measures. As expected according to our second hypothesis, the results support the argument that the negative association between CEO power and bank risk is more pronounced in uncertainty avoidance societies. We interpret this result as suggesting that, in the interaction between CEO power and the uncertainty avoidance culture environment in which the bank CEOs are operating, the effect of the former reinforces the effect of the latter such that the overall effect on bank risk-taking is negative. Considering Model (1), the economic significance of the results indicates that an increase in the interaction term between individualism and CEO power (*CEOpower*UAV*) by one standard deviation would increase bank risk measured by *sdROA* (in logarithmic form) by approximately 4% points (ln(59.70) * (0.015)/ln(0.19)= 0.04, where 59.70 is the standard deviation of *CEOpower*UAV* and 0.19 is the average of *sdROA*.

The results for other CEO characteristics show that overconfident CEOs tend to take more risks. CEO age (*Age*), has a negative effect on *sdROA*, *LLP*, *Beta,* and *LnZ* (except Models 2 and 8) suggesting that older bank CEOs are associated with less bank risk-taking. These results are consistent with those obtained by Deshpande (1997), who surveyed 252 managers and found that younger managers disclose confidential information and conceal other managers' errors, and hence tend to be less

Table 5
Alternative statistical approaches.

	Sign	(1) sdROA	(2) LLP	(3) Beta	(4) LnZ	(5) sdROA	(6) LLP	(7) Beta	(8) LnZ
Panel A: Endogeneity and causality		*GMM regression results*				*Instrumental results (2SLS2)*			
IND	+	0.038 * **	0.082 * **	0.078 * **	-0.080 * **	0.028 * **	0.092 * **	0.067 * **	-0.025 * **
		(3.47)	(4.19)	(5.04)	(−4.39)	(4.58)	(3.15)	(4.24)	(−5.84)
UAV	-	-0.011 * **	-0.020 * **	-0.035 * **	0.038 * **	-0.012 * **	-0.018 * **	-0.024 * **	0.057 *
		(−3.78)	(−3.51)	(−4.23)	(2.60)	(−4.05)	(−2.88)	(−3.15)	(1.94)
CEOpower	-	-0.010 * **	-0.071 * *	-0.041 * *	0.115 * *	-0.008 * **	-0.087 * **	-0.028 * *	0.107 * *
		(−3.54)	(−2.03)	(−2.28)	(2.33)	(−3.54)	(−2.87)	(−1.99)	(2.65)
CEOpower*IND	+	0.015 * *	0.182 * *	0.090 * *	-0.121 * *	0.018 * **	0.098 * *	0.095 * **	-0.005 * *
		(2.00)	(2.51)	(2.00)	(−2.53)	(3.58)	(1.98)	(3.04)	(−2.05)
CEOpower*UAV	-	-0.014 *	-0.101 *	-0.045 *	0.089 * *	-0.025 *	-0.098	-0.014 * *	0.088 * *
		(−1.81)	(−1.74)	(−2.02)	(2.23)	(−1.85)	(−1.01)	(−2.15)	(2.00)
Overconfident	+	0.006 * *	0.180 * *	0.067 * *	-0.030	0.054 *	0.087 * *	0.045 * **	-0.025 *
		(2.84)	(2.52)	(2.04)	(−0.36)	(1.94)	(2.14)	(3.01)	(−1.72)
Male	+	0.008 * *	0.092	0.084	-0.005 * *	0.015 * *	0.102	0.025	-0.008 * *
		(2.16)	(0.42)	(0.85)	(−2.02)	(1.98)	(0.87)	(1.02)	(−2.24)
International Q	+	-0.004	0.042	0.002	0.001	0.012	0.035	0.007	0.007
		(−0.52)	(0.36)	(1.06)	(0.04)	(0.87)	(1.25)	(1.14)	(1.02)
Internally	-	-0.007 * *	-0.051	-0.045	0.044 * *	-0.018 * **	-0.088 * *	-0.038	0.035 * *
		(−2.48)	(−0.60)	(−1.00)	(2.48)	(−3.58)	(−2.25)	(−1.09)	(2.00)
H.Edu	-	-0.008 * **	-0.020	-0.038	0.103 *	-0.048 * **	-0.029 *	-0.028	0.102 *
		(−2.71)	(−0.27)	(−0.27)	(1.71)	(−3.54)	(−1.75)	(−1.11)	(1.92)
Ownership	-/+	-0.011	-0.100	-0.098	0.210	-0.087	-0.125	-0.087	0.199
		(−1.20)	(−0.46)	(−0.04)	(0.61)	(−1.18)	(−0.88)	(−0.12)	(1.02)
LgTenure	-	-0.005 * *	-0.008 * *	-0.010 * *	0.031	-0.047 * *	-0.011 * *	-0.018 * *	0.029
		(−2.18)	(−2.00)	(−2.25)	(0.13)	(−1.98)	(−2.25)	(−2.44)	(0.55)
Age	-	-0.007 * *	-0.015 *	-0.008 *	0.018 *	-0.004 * *	-0.022 *	-0.010 *	0.014 *
		(−2.71)	(−1.90)	(−1.88)	(1.93)	(−2.87)	(−1.78)	(−1.77)	(1.74)
Size	-	-0.010 * *	-0.736 * **	-0.087 * **	0.731 * **	-0.008 * *	-0.654 * **	-0.092 * **	0.699 * **
		(−2.31)	(−4.38)	(−5.02)	(5.45)	(−2.00)	(−5.02)	(−6.04)	(3.98)
Capital	-	-0.109 * **	-1.52	-0.01	0.646 * **	-0.097 * *	-1.220	-0.008	0.584 * **
		(−2.70)	(−1.43)	(−1.02)	(3.65)	(−2.14)	(−0.44)	(−1.02)	(3.54)
Deposits	+	0.002 * *	0.020	0.008	-0.601 * *	0.010 * *	0.016	0.005	-0.771 * **
		(2.14)	(1.04)	(1.28)	(−2.08)	(2.50)	(1.23)	(0.28)	(−8.25)
Q	-	-0.005 * **	-0.128 * **	-0.098 * *	0.099 * *	-0.008 * **	-0.110 * *	-0.045 * *	0.081 * *
		(−4.77)	(−2.72)	(−3.25)	(3.18)	(−3.58)	(−2.53)	(−3.87)	(3.00)
CR	-	-0.011 * *	-0.220 *	-0.090 *	-0.174	-0.009 * *	-0.193 * *	-0.105 * *	-0.108
		(−2.01)	(−1.74)	(−1.85)	(−0.62)	(−1.98)	(−1.98)	(−1.96)	(−1.25)
CommonLaw	-	-0.041	-0.262	-0.125	-0.780	-0.039	-0.120	-0.104	-0.654
		(−1.29)	(−0.23)	(−1.28)	(−0.76)	(−1.58)	(−1.35)	(−1.62)	(−0.48)
Corruption	+	0.002 * **	0.040 *	0.008 *	0.030	0.008 * **	0.028 * *	0.012 *	-0.029 *
		(3.68)	(1.90)	(1.79)	(1.18)	(2.58)	(1.95)	(1.89)	(−1.78)
GDPgr	-/+	-0.001	-0.252	-0.074	0.770 * **	-0.012	-0.012	-0.045	0.555 * *
		(−0.60)	(−1.00)	(−1.08)	(3.50)	(−0.87)	(−1.52)	(−1.00)	(1.98)
Government Inst.	-	-0.005	-0.054	-0.023 *	0.105	-0.010	-0.187	-0.041 * *	0.134 * *
		(−1.12)	(−1.49)	(−1.92)	(1.56)	(−0.45)	(−0.20)	(−1.99)	(2.10)
Constant		0.061	-0.209 * *	-0.077 * *	1.510	0.070	-0.187 * *	-0.045 * **	0.870
		(1.19)	(−2.35)	(−2.01)	(1.08)	(1.25)	(−1.95)	(−2.82)	(1.11)
Hansen *J*-statistics		155.00	187.54	156.38	148.75				
AR_1		-5.27 * *	-4.77 * *	-5.02 * *	-3.58 * *				
AR_2		-0.57	-0.88	-0.62	-0.24				
Cragg-Donald Wald F						24.40	21.00	25.28	28.62
(StockYogo-critical 5%)						(19.93)	(19.93)	(18.57)	(19.93)
Sargan *P-value*						0.102	0.132	0.142	0.245
Wald-Chi2		1251.1 * **	1534.25 * *	136.84 * *	1587.24 * *				
Adjusted R2						0.21	0.27	0.29	0.32
N		5025	5025	5025	5025	5025	5025	5025	5025
	Sign	(1) sdROA	(2) LLP	(3) Beta	(4) LnZ	(5) sdROA	(6) LLP	(7) Beta	(8) LnZ
Panel B: Other regressions		*Cluster adjusted standard errors*				*Weighted regression*			
IND	+	0.037 * **	0.062 * **	0.195 * **	-0.022 * *	0.020 * **	0.033	0.023 * **	-0.088 * **
		(3.11)	(5.26)	(5.01)	(−2.20)	(2.94)	(0.11)	(7.04)	(−3.75)
UAV	-	-0.017 * **	-0.017 * *	-0.024 * **	0.033 * **	-0.009 * *	-0.024 * *	-0.092 * **	0.021 * *
		(−3.37)	(−3.04)	(−2.88)	(7.02)	(−2.46)	(−2.13)	(−2.88)	(2.28)
CEOpower	-	-0.013 * **	-0.020 * *	0.052 * *	0.097 * **	-0.009 * **	-0.020 * **	-0.018 *	0.102 * **
		(−5.72)	(−2.40)	(−2.07)	(2.60)	(−3.34)	(−2.77)	(−1.86)	(2.61)
CEOpower*IND	+	0.013 * *	0.136 *	0.081 *	-0.182	0.010 * **	0.189 * **	-0.023 * *	-0.129 * **
		(2.03)	(1.75)	(1.91)	(−0.87)	(2.88)	(2.71)	(−2.12)	(−3.68)
CEOpower*UAV	-	-0.012 * *	-0.082 * *	-0.052 * *	0.045	-0.009 * *	-0.029 * *	-0.022	0.052
		(−2.08)	(−2.05)	(−2.22)	(0.81)	(−2.52)	(−2.08)	(−1.00)	(0.64)
Overconfident	+	0.002 * *	0.064 * **	0.085 * *	-0.032	0.002 * *	0.467	0.842	-0.732 *
		(2.53)	(3.12)	(2.29)	(−1.36)	(2.13)	(0.38)	(1.07)	(−1.72)
Male	+	0.001 * **	0.041	0.028	-0.142 *	0.020 * *	1.693	0.987	-1.728
		(4.43)	(0.57)	(0.08)	(−2.15)	(2.25)	(0.20)	(0.50)	(−0.86)

(*continued on next page*)

Table 5 (*continued*)

	Sign	(1) sdROA	(2) LLP	(3) Beta	(4) LnZ	(5) sdROA	(6) LLP	(7) Beta	(8) LnZ
Panel A: Endogeneity and causality		*GMM regression results*				*Instrumental results (2SLS2)*			
International Q	+	0.001	0.015	0.041	-0.068 *	0.005	0.272 *	0.182 * *	-0.056
		(0.84)	(0.34)	(1.05)	(−1.69)	(0.20)	(1.90)	(2.02)	(−0.07)
Internally	-	-0.002 * **	-0.026 *	-0.018 * *	0.080 * *	-0.008 * *	-0.817	-0.054	0.111 *
		(−4.22)	(−1.75)	(−1.99)	(2.06)	(−2.31)	(−0.31)	(−0.81)	(1.69)
H.Edu	-	-0.001 *	-0.045	-0.001	-0.037	-0.019 * **	-0.659	-0.021	0.658 * **
		(−1.69)	(−1.33)	(−1.00)	(−1.03)	(−2.92)	(−1.24)	(−1.00)	(2.86)
Ownership	-/+	-0.015	-0.019	-0.010	0.067	-0.234	-0.798	-0.455	0.750 * **
		(−0.16)	(−0.13)	(−0.98)	(0.47)	(−0.99)	(−0.56)	(−1.45)	(2.99)
LgTenure	-	-0.003 * *	-0.045	-0.001	0.145	-0.039 * *	-0.365 * *	-0.652 * **	1.815
		(−1.89)	(−0.34)	(−0.01)	(1.48)	(−2.42)	(−2.34)	(−3.02)	(0.87)
Age	-	-0.012 * **	-0.007 * *	-0.010 * *	-0.001	-0.001 * *	0.049 * **	0.011 * **	0.022 * *
		(−5.80)	(−2.10)	(−1.98)	(−0.41)	(−2.16)	(2.67)	(2.65)	(2.57)
Size	-	-0.003 * *	-0.110 * **	-0.095 * **	0.266 * **	-0.010 * *	-0.981 * **	-0.523 * **	0.752 * **
		(−2.67)	(−9.31)	(−4.85)	(7.91)	(−2.27)	(−4.44)	(−3.99)	(6.37)
Capital	-	-0.035 * *	-1.147 * *	-0.004	0.743 * **	-0.777 * *	-0.765	-0.026	0.039 * **
		(−2.18)	(−1.87)	(−1.25)	(8.37)	(−2.47)	(−0.82)	(−0.20)	(6.89)
Deposits	+	0.001 *	0.018	0.001	-0.110 *	0.064 * **	2.575 * *	0.054 * *	-0.704 * **
		(2.13)	(1.15)	(1.05)	(−1.87)	(5.19)	(2.53)	(2.23)	(−3.30)
Q	-	-0.003 * **	-0.064 * *	-0.042 * **	0.018	-0.155 * **	-0.810 * **	-0.120 * **	0.745 * **
		(−4.41)	(−2.23)	(−3.21)	(0.70)	(−3.59)	(−2.62)	(−3.44)	(4.59)
CR	-	-0.054 * *	-0.005 * *	-0.008 * *	-0.034	-0.019 *	-0.846 * *	-0.065 * *	1.206 *
		(−2.41)	(−2.18)	(−1.97)	(−1.58)	(−1.69)	(−2.50)	(−1.98)	(1.94)
CommonLaw	-	0.003	-0.083	-0.015	-0.015	-0.198 * *	0.031	0.002	0.938
		(1.49)	(−1.38)	(−1.09)	(−0.27)	(−2.26)	(1.20)	(1.01)	(0.64)
Corruption	+	0.002 * **	0.036 * **	0.007 * **	-0.007	0.046 * **	1.380	0.045	-0.021 * **
		(6.03)	(3.36)	(2.99)	(−0.51)	(3.48)	(1.52)	(0.12)	(−4.38)
GDPgr	-/+	-0.001	-0.001	-0.000	0.214 * **	-0.102 * *	-0.527	-0.045	0.071 * **
		(−0.56)	(−0.01)	(−0.15)	(5.10)	(−2.45)	(−0.14)	(−1.12)	(4.61)
Government Inst.	-	-0.009	-0.105	-0.054	0.084 * *	-0.011	-0.207	-0.065	0.089 *
		(−1.00)	(−0.84)	(−1.05)	(2.00)	(−1.53)	(−1.11)	(−0.15)	(1.80)
Constant		0.032 * *	-1.535 * *	-0.054 *	1.800 * **	-0.002	0.018	0.005	-0.316 * **
		(3.16)	(−2.55)	(−1.69)	(6.59)	(−0.66)	(0.05)	(0.54)	(−2.94)
Adjusted R2		0.34	0.28	0.27	0.26	0.27	0.30	0.29	0.32
N		5025	5025	5025	5025	5025	5025	5025	5025

This table presents the results for alternative statistical approaches. Panel A reports the results for the two-step GMM and Panel B shows the results for instrumental variables using 2SLS (three instrumental variables as religion, ethnical fractionalization, and geography are used for cultural values and industry-median CEO power for CEO power) using Eq. (1). Panel C presents the results for cluster-adjusted standard errors using Eq. (1). Panel D uses a weighted regression model, where the weight of each observation is the inverse of the number of observations in each country so that each country receives equal weight in the estimation. The data is from 336 banks across 48 countries in 1999–2013. The risk measure as the dependent variable is the standard deviation of ROA (sdROA) in Models 1, 4, 7, and 10, the mean loan loss provision/net loans (LLP) in Models 2, 5, 8, and 11, Beta Beta which is estimated on a regression of daily stock returns of individual stocks in excess of 3-month T-bills against MSCI world index, and the natural logarithm of Z-score= [Average (returns)+Average (Equity/total assets))]/Std (Equity/total assets) (LnZ) in Models 3, 6, 9, and 12. All variables are defined in Table 1. In Panel A Hansen J-statistics are reported to test for over-identifying restrictions. AR1 and AR2 are also reported to test statistics for the first- and second-order serial correlations, respectively. For Panel B, Cragg-Donald Wald F-statistics (Cragg-Donald Wald F), the Stock–Yogo critical value for the F-test (i.e. 5% maximal IV relative bias), and p-values of Sargan overidentification test for all instruments are reported. For Panels B, C, and D, adjusted R-squared (Adjusted R2) is presented. N is the number of observations. Year dummies are included in all models. The figures in parentheses are t-statistics. * ** , * *, and * represent significance at 1%, 5%, and 10%, respectively.

conservative. We also find that CEO tenure (*LnTenure*) has a negative impact on bank risk-taking (*sdROA* and *LnZ*), suggesting that risk-taking is avoided as tenure increases. The results detect a significant impact of CEOs' international qualification (*International Q*) only in model 8 where insolvency risk (*LnZ*) is the dependent variable. This result is in line with Carpenter et al. (2001), who argue that CEOs with international assignment experience gain valuable social resources, and Slater and Dixon-Fowler (2009), who show that CEO internal assignment experience increases corporate social performance.

The results for bank-level control variables are largely consistent with the predictions of our study, as well as the related literature on corporate risk-taking. For example, in line with Anderson and Fraser (2000) and Haq and Heaney (2012), the results show that Keeley's (1990) Q (*Q*) negatively affects bank risk-taking. The results for Tier 1 capital (*Capital*) show that bank risk decreases with Tier 1 capital, suggesting that high-quality capital is associated with a reduction in risk (e.g., Conlon et al., 2020). Our results further support that bank risk (*sdROA, LLP, Beta,* and *LnZ*) is negatively related to country-level governance, measured by creditor rights (*CR*), but is positively related to the level of corruption (*Corruption*).

Panel B of Table 4 shows the results for the marginal effects of Eq. (1), with standard errors obtained by the Delta method to provide more detail on our findings in Panel A. The first column (c) reports the 10 and 12 values of individualism and uncertainty avoidance covariate, respectively, in the range of 13–93 for individualism and 8–118 for uncertainty avoidance observed in the sample. Columns 2, 4, and 6 report the values of the marginal effects of CEO power (*CEOpower*) on bank risk, given the constant reported in the same row of the first column. For example, for individualism, we find that the average marginal effect of CEO power on bank risk measured by *sdROA* (Column 2) ranges between 0 and 0.029 when individualism is at the maximum of its range in our sample. Therefore, the association between CEO power and bank risk changes depending on individualism value. In more detail, the average marginal effect of CEO power on *sdROA* is not significant when individualism values are in the range of 13–23, while it is positive and statistically significant thereafter. The results are relatively similar for other measures of bank risk (*LLP* and *LnZ*). For uncertainty avoidance, we find that the average marginal effect of CEO power on bank risk measured by *sdROA* (Column 2) ranges between 0.009 and 0.027 when individualism is at the maximum of its range in our sample. Therefore,

Table 6
Regression results based on use of alternative cultural indexes for bank risk.

Variable	Sign	(1) sdROA	(2) LLP	(3) Beta	(4) LnZ	(5) sdROA	(6) LLP	(7) Beta	(8) LnZ
		Panel A: GLOBE cultural index				*Panel B: Schwartz's Cultural index*			
H-IDV	+	0.027 * *	0.088 * *	0.054 * **	-0.030 * *				
		(2.46)	(2.40)	(3125)	(−2.37)				
H-UAI	-	-0.002 * **	-0.413 * *	-0.354 * *	0.361 * **				
		(−3.43)	(−2.56)	(−2.54)	(5.04)				
CEOpower	-	-0.055 * *	-0.041 * *	-0.010 *	0.036 * **	-0.239 * *	-0.532 * *	0.012 * *	0.464 *
		(−2.41)	(−2.22)	(−1.77)	(3.62)	(−2.27)	(−2.17)	(−2.27)	(1.94)
CEOpower*H-IDV	+	0.091 * **	0.117 * **	0.029 *	-0.059 * *				
		(2.79)	(2.89)	(1.85)	(−2.26)				
CEOpower*H-UAI	-	-0.001 * **	-0.036 * *	-0.021 * *	0.069 * *				
		(−3.47)	(−2.27)	(−2.00)	(2.23)				
Autonomy	+					0.711 * *	0.711 * *	0.025 * *	-0.032 *
						(2.37)	(0.52)	(2.10)	(−1.71)
Harmony	-					-0.111 * **	-0.303 * **	-0.017 *	0.584 * *
						(−3.69)	(−2.74)	(−1.89)	(2.49)
CEOpower* Autonomy	+					0.740 * *	0.616 * *	0.027 * *	-0.870 * *
						(2.43)	(2.53)	(2.10)	(−2.05)
CEOpower* Harmony	-					-0.808 * *	-0.116 * **	-0.020 * *	0.736 * **
						(−2.53)	(2.77)	(2.06)	(2.80)
Overconfident	+	0.002	0.519	0.025 * *	-0.051 * *	0.001	0.215	0.021 * *	-0.817 *
		(0.12)	(0.43)	(2.02)	(−2.52)	(0.06)	(0.18)	(2.22)	(−1.94)
Male	+	0.005	1.399	0.432	-0.366	0.016	0.903	0.387	-1.819
		(0.07)	(0.17)	(0.25)	(−0.18)	(0.20)	(0.11)	(1.01)	(−0.91)
International Q	+	0.011	0.398 *	0.028	-0.072	-0.009	0.174 * *	0.031	-0.234
		(0.43)	(1.97)	(1.02)	(−0.09)	(−0.37)	(2.24)	(0.98)	(−0.28)
Internally	-	-0.012	1.481	0.951	0.899	-0.017	1.526	0.821	1.296 *
		(−0.46)	(0.56)	(1.21)	(1.33)	(−0.69)	(0.58)	(1.00)	(1.92)
H.Edu	-	-0.014	-0.683	-0.021 * **	0.015 * **	-0.016	-0.030	-0.019 * **	0.042 *
		(−0.72)	(−1.25)	(−2.68)	(2.80)	(−0.81)	(−1.37)	(−3.25)	(0.95)
Ownership	-/+	0.200	0.854	-0.450 * **	0.706 * **	0.330	0.619	-0.354 * **	0.807 * **
		(0.85)	(0.64)	(−3.02)	(2.73)	(1.42)	(0.63)	(−2.98)	(3.01)
LnTenure	-	-0.000	-0.892 * *	-0.154	0.172	-0.050	-0.962 * *	-0.105	0.071
		(−0.00)	(−2.54)	(−1.02)	(0.56)	(−0.56)	(−2.57)	(−1.32)	(0.51)
Age	-	-0.000	-0.476 * **	-0.027	-0.009	-0.000	-0.429 * *	-0.020	0.012
		(−0.11)	(−2.84)	(−0.98)	(−0.24)	(−0.26)	(−2.54)	(−0.92)	(0.31)
Size	-	-0.026 * *	-0.653 * **	-0.412 * **	0.937 * **	0.009 * *	0.768 * **	-0.304 * **	0.905 * **
		(−1.73)	(−4.33)	(−4.25)	(5.13)	(2.27)	(4.38)	(−4.28)	(8.24)
Capital	-	-0.588	-0.081	-0.123 * **	0.964 * **	0.439 * **	-0.561	-0.100 * **	0.992 * **
		(−1.10)	(−1.24)	(−7.05)	(6.68)	(−2.69)	(−1.41)	(−6.54)	(6.44)
Deposits	+	0.068 * **	0.651 * **	0.452 * **	-0.693 * **	0.057 * **	0.492 * *	0.386 * **	-0.526 * **
		(5.57)	(2.60)	(5.02)	(−3.43)	(4.80)	(2.45)	(7.04)	(−4.30)
Q	-	-0.146 * **	-0.650 * **	-0.105 * **	0.216 * **	-0.173 * **	-0.512 * **	-0.095 * **	0.831 * **
		(−3.40)	(−2.62)	(−6.54)	(5.07)	(−4.07)	(−3.25)	(−4.02)	(4.59)
CR	-	-0.050	-2.372	-0.624	-0.271	-0.032	-0.377 * **	-0.147	0.478 * **
		(−1.38)	(−0.87)	(−1.09)	(−0.39)	(−1.07)	(−2.64)	(−0.24)	(4.00)
CommonLaw	-	-0.133 *	0.773	-0.087	0.050	-0.034 * *	-0.009	-0.025	1.868
		(−1.76)	(0.63)	(−1.07)	(0.04)	(−2.45)	(−1.08)	(−1.00)	(1.18)
Corruption	+	0.050 * **	0.708	0.254 * **	-0.852 * **	0.045 * **	0.259 * *	0.197 * **	-0.357 * *
		(3.35)	(0.72)	(2.87)	(−3.39)	(2.89)	(2.24)	(2.65)	(−2.33)
GDPgr	-/+	-0.082 *	-2.202	-0.154	-0.777	-0.090 * *	-0.204	-0.087	0.025
		(−1.89)	(−0.57)	(−0.18)	(−0.78)	(−2.46)	(−0.06)	(−1.08)	(1.58)
Government Inst.	-	-0.002	-0.009	-0.005	0.268 * *	-0.001	-0.001	-0.001	0.371 * **
		(−0.61)	(−0.02)	(−0.49)	(2.49)	(−0.47)	(−0.00)	(−0.02)	(3.44)
Constant		0.103 * **	-0.512 *	0.851	0.473	2.371 * *	1.337	0.971	0.861 * *
		(3.06)	(−1.95)	(1.07)	(1.58)	(2.56)	(1.27)	(1.21)	(2.56)
Wald-Chi2		1085.23 * **	1038.36 * **	1242.02 * **	1023.35 * **	189.36 * **	285.35 * **	395.11 * **	199.68 * **
R-squared		0.26	0.23	0.35	0.18	0.20	0.19	0.25	0.21
N		5025	5025	5025	5025	4710	4710	4710	4710

This table presents the results for the generalized least squares random effect (GLS RE) using House et al. (2004)'s cultural dimensions (individualism, H-IND, uncertainty avoidance, H-UAI) and Schwartz's Autonomy and Harmony dimensions (Schwartz, 2006, 2008). In Panel A, the data is from 336 banks across 48 countries in 1999–2013. In Panel B, the data is from 315 banks across 42 countries in 1999–2013. The risk measure as the dependant variable is the standard deviation of ROA (sdROA) in Models 1 and 5, loan loss provision/net loans (LLP) in Models 2 and 6, Beta which is estimated on a regression of daily stock returns of individual stocks in excess of 3-month T-bills against MSCI world index in Models 3 and 7, and the natural logarithm of Z-score= [Average (returns)+Average (Equity/total assets))]/Std (Equity/total assets) (LnZ) in Model 4 and 8. All variables are defined in Table 1. Between R-squared (R-squared) and Wald test (Wald-Chi2) are reported. Year dummies are included in all models. N is the number of observations. The figures in parentheses are t-statistics. * ** , * *, and * represent significance at 1%, 5%, and 10% respectively.

the relationship between CEO power and bank risk changes depending on uncertainty avoidance value. In more detail, the average marginal effect of CEO power on *sdROA* is not significant when individualism values are in the range of 18–28, while it is negative and statistically significant thereafter. The results are relatively similar for other measures of bank risk (*LLP* and *LnZ*).

Table 7
Other robustness checks.

	Sign	(1) sdROA	(2) LLP	(3) Beta	(4) LnZ
Panel A: Omitted variables					
IDV	+	0.021 * *	0.091 * *	0.104 * *	-0.125 * **
		(2.15)	(1.98)	(2.10)	(−3.05)
UAI	-	-0.014 * **	-0.178 * *	-0.098 * *	0.154 * *
		(−4.68)	(−2.41)	(−2.01)	(2.45)
CEOpower	-	-0.011 *	-0.113 * *	-0.045 * *	0.113 * *
		(−1.78)	(−2.63)	(−2.00)	(2.41)
CEOpower*IDV	+	0.015 * **	0.219 * **	0.080 *	-0.161 *
		(3.87)	(2.58)	(1.83)	(−1.92)
CEOpower*UAI	-	-0.015 * *	-0.084	-0.021	0.058 *
		(−1.99)	(−1.08)	(−1.02)	(1.81)
Controls		Yes	Yes	Yes	Yes
Wald-Chi2		1124.32 * **	1245.35 * **	1140.24 * **	1245.65 * **
R-squared		0.34	0.32	0.42	0.32
N		5025	5025	5025	5025
Panel B: Including only commercial banks					
IDV	+	0.022 * *	0.145 * *	0.123 * *	-0.150 *
		(2.08)	(2.45)	(1.95)	(−1.86)
UAI	-	-0.012 * *	-0.100 * *	-0.094 * *	0.110 * **
		(−2.04)	(−2.27)	(−2.02)	(3.53)
CEOpower	-	-0.012 * **	-0.098 * *	-0.024 * *	0.105
		(−3.29)	(−2.17)	(−2.07)	(0.77)
CEOpower*IDV	+	0.018 *	0.225 * *	0.072 *	-0.152
		(1.98)	(2.53)	(1.80)	(−1.48)
CEOpower*UAI	-	-0.012 * *	-0.058 * *	-0.005	0.056 * *
		(−2.06)	(−2.30)	(−1.10)	(2.14)
Controls		Yes	Yes	Yes	Yes
Wald-Chi2		1023.32 * **	1184.32 * **	1566.58 * **	1534.01 * **
R-squared		0.28	0.35	0.29	0.31
N		2385	2385	2385	2385
Panel C: Alternative variable for CEO power					
IDV	+	0.018 * **	0.095 * *	0.078 * **	-0.108 * **
		(2.99)	(2.14)	(3.42)	(−2.91)
UAI	-	-0.015 * *	-0.051 * **	-0.011 *	0.019 *
		(−2.33)	(−2.96)	(−1.84)	(1.77)
CEOpower	-	-0.011 *	-0.068 *	-0.010 *	0.021 *
		(−1.83)	(−1.75)	(−1.92)	(1.90)
CEOpower*IDV	+	0.019 *	0.121 * *	0.031 *	-0.099 *
		(1.82)	(2.02)	(1.92)	(−1.74)
CEOpower*UAI	-	-0.015 * **	-0.032 *	-0.014 * *	0.041 * *
		(−2.58)	(−1.82)	(−2.35)	(−2.45)
Controls		Yes	Yes	Yes	Yes
Wald-Chi2		1198.62 * **	1256.34 * **	1215.80 * **	1756.00 * **
R-squared		0.25	0.30	0.31	0.30
N		5025	5025	5025	5025
Panel D: Excluding Japan					
IDV	+	0.016 * *	0.087 * **	0.101 * *	-0.101 * *
		(2.51)	(2.85)	(2.02)	(−2.02)
UAI	-	-0.012 * *	-0.071 * *	-0.021 * *	0.018 * **
		(−2.00)	(−2.38)	(−1.98)	(2.75)
CEOpower	-	-0.010 *	-0.052 *	-0.035 *	0.028 *
		(−1.85)	(−1.91)	(−1.94)	(1.87)
CEOpower*IDV	+	0.020 * *	0.121 *	0.046 * *	-0.109 *
		(2.02)	(1.87)	(2.14)	(−1.88)
CEOpower*UAI	-	-0.010 * *	-0.031 * **	-0.019 *	0.040 *
		(−2.18)	(−5.15)	(−1.95)	(1.90)
Controls		Yes	Yes	Yes	Yes
Wald-Chi2		1178.53 * **	1289.45 * **	1220.32 * **	1785.36 * **
R-squared		0.25	0.31	0.34	0.30
N		3990	3990	3990	3990
Panel E: Including bank dummies					
IDV	+	0.011 * *	0.055 * **	0.095 * **	-0.123 * **
		(2.42)	(2.91)	(2.87)	(−7.90)
UAI	-	-0.013 * **	-0.058 * **	-0.041 * **	0.014 * *
		(−3.83)	(−2.79)	(−2.69)	(7.58)
CEOpower	-	-0.011 * *	-0.032 * *	-0.029 * *	0.018 * *
		(−2.03)	(−2.31)	(−2.17)	(2.47)
CEOpower*IDV	+	0.022 * *	0.123 * *	0.065 * **	-0.097 * *
		(2.51)	(2.20)	(2.58)	(−2.40)
CEOpower*UAI	-	-0.009 * *	-0.031 * **	-0.020 * *	0.025 * *
		(−2.13)	(−3.22)	(−2.35)	(1.83)
Controls		Yes	Yes	Yes	Yes
Wald-Chi2		1897.25 * *	1875.28 * *	1122.12 * *	1746.22 * *

(*continued on next page*)

Table 7 (*continued*)

	Sign	(1) sdROA	(2) LLP	(3) Beta	(4) LnZ
R-squared		0.31	0.31	0.29	0.29
N		5025	5025	5025	5025
Panel F: Excluding post financial crisis period					
IDV	+	0.018 * *	0.071 * **	0.088 * **	-0.068 * **
		(2.50)	(3.41)	(3.10)	(−6.87)
UAI	-	-0.022 * **	-0.045 * **	-0.025 * **	0.021 * *
		(−2.98)	(−2.81)	(−3.74)	(8.14)
CEOpower	-	-0.010 * *	-0.027 * *	-0.020 * *	0.012 *
		(−2.14)	(−2.00)	(−2.12)	(1.78)
CEOpower*IDV	+	0.018 * **	0.094 * *	0.034 * *	-0.047 * **
		(3.02)	(1.99)	(2.20)	(−3.88)
CEOpower*UAI	-	-0.014 *	-0.010 * **	-0.012 * *	0.010 * *
		(−1.94)	(−4.01)	(−2.01)	(1.94)
Controls		Yes	Yes	Yes	Yes
Wald-Chi2		1478.27 *	1257.18 * *	1145.27 * *	1143.17 * **
R-squared		0.29	0.33	0.27	0.30
N		3015	3015	3015	3015

This table presents the results for robustness checks using generalised least squares random effect (GLS RE). Panel A presents the results after adding deposit insurance (Deposit Inst.) which is a dummy variable equal to one where there is explicit deposit insurance (Demirgüç-Kunt et al., 2008), and inflation rates obtained from World Bank. Panel B presents the results only for commercial banks. Panel C presents the results for an alternative measure for CEO power which is measured as CEO equity stake in the bank (%) (Onali et al., 2016). Panel D excludes the observations in Japan. Panel E controls for firm heterogeneity by adding bank dummies. Panel F excludes the post financial period (2008–2013). The data is from 336 banks across 48 countries (except Panel D where Japan is excluded) in 1999–2013. The risk measure as the dependant variable is the standard deviation of ROA (sdROA) in Model 1, loan loss provision/net loans (LLP) in Model 2, Beta which is estimated on a regression of daily stock returns of individual stocks in excess of 3-month T-bills against MSCI world index in Model 3, and the natural logarithm of Z-score= [Average (returns)+Average (Equity/total assets))]/Std (Equity/total assets) (LnZ) in Model 4. All variables are defined in Table 1. Between R-squared (R-squared) and Wald test (Wald-Chi2) are reported. Year dummies are included in all models. N is the number of observations. The figures in parentheses are t-statistics. * ** , * *, and * represent significance at 1%, 5%, and 10%, respectively.

4.3. Robustness checks

4.3.1. Alternative statistical approaches

We first test for robustness in terms of alternative specifications. The results are reported in Table 5. In panel A (Models 1–4), we use the system Generalized Method of Moments (GMM) econometric technique to control for any possible unobserved endogeneity[14] and simultaneity, and to mitigate concerns regarding reverse causality and possible confounding effects in the dynamic panel data. In this approach, variables are instrumented with their own first differences. Thus, first differenced time-variant variables are used as instruments. The Hansen J-statistics (*p-values*) indicate that the instruments are valid in this estimation. AR (1) and AR(2) are reported to test for first-order and second-order serial correlation, asymptotically distributed as *N(0,1)* under the null of no first-order and second-order serial correlation, respectively. We expect significant differences in the estimation results between the original model and GMM estimations to indicate that unknown heterogeneities are endogenous and might have skewed the results in the original model (Arellano and Bond, 1991). However, we observe that the results remain qualitatively unchanged compared with those reported in Table 4 Panel A, suggesting that national culture establishes boundary conditions for the influence of CEO power on bank risk-taking.

Although we expect cultural values to be exogenous, it may still be argued that Hofstede's cultural values may not be exogenous enough. In fact, the type of financial architecture in place may dictate the risk tolerance of the culture (Kashefi-Pour et al., 2020; Kwok and Tadesse, 2006; Li et al., 2013). Moreover, cultural values may correlate with unobserved cultural traits that may affect risk-taking. To address the endogeneity concern about our cultural values, we conduct an Instrumental Variables (IV) regression in Panel A (Models 5–8). Hence, we follow Li et al. (2013) to employ the instrumental variable approach. The instruments are selected based on potential determinants of cultural values as well as the availability of data. For uncertainty avoidance, we use religion, ethnical fractionalization, and geography (Kwok and Tadesse, 2006). We use the percentages of the population of each country that belong to the Roman Catholic, Protestant, and Muslim religious faiths in 1980 from Alesina et al. (2003) as a proxy for religion. We use a measure of the degree of ethnic heterogeneity in a given country from Alesina et al. (2003) to proxy for ethnical fractionalization. Following Kwok and Tadesse (2006), we use the continent of a country as a proxy for geography. For individualism/collectivism, following Boubakri et al. (2017), we use the historical prevalence of infectious diseases across geopolitical regions. It is argued by Fogli and Veldkamp (2012) that more collectivist societies have a more effective structure to hinder the spread of such diseases. Moreover, there may be concerns about reverse causality if bank risk causes a change in CEO power, and hence it is quite possible that CEO power is determined by bank and country risk. Following Sheikh (2019) who argues that CEO power is highly influenced by industry type, as CEOs are more likely to gain power in an industry that tends to give more power to its CEOs, we use the industry median CEO power index as an instrumental variable. We perform standard tests to ensure that our instruments are valid. The reported Wald *F*-statistics based on Stock and Yogo (2005) are higher than the Stock-Yogo critical value (i.e. 5% maximal IV relative bias), indicating that the included instruments are not weak instruments at the 5% significance level. The Sargan (*p-values*) over-identification test for the null hypothesis that our instrumental variables are uncorrelated with the error term is also reported, indicating that our instrumental variables are exogenous. For the sake of brevity, we have reported the results of the second stage only where the predicted values from stage I, instead of the individualism, uncertainty avoidance values, and CEO power are used. The results remain consistent with those reported in Table 4 Panel A.

Moreover, in Panel B (Models 1–4), we have obtained results based on cluster-adjusted standard errors at the country level to account for heteroscedasticity and serial correlation of errors (Petersen, 2009). The results are consistent with the predicted sign. Models 1–4 show that individualism is positively and significantly related to bank risk-taking, while uncertainty avoidance also maintains an inverse and significant relationship with bank risk-taking. In addition, the negative impact of

[14] GMM allows for the possibility of endogeneity between the risk variables (as the dependent variable) and some of the right-hand side variables through the application of appropriate instruments.

Table 8
Regression results on intra-country cultural diversity (tight vs loose) and bank risk-taking.

		sdROA		LLP		Beta		LnZ	
	Sign	Tight	Loose	Tight	Loose	Tight	Loose	Tight	Loose
IND	+	0.035 * *	0.017	0.986 * **	0.901 * **	0.022 * **	0.016 * **	-0.111 * **	0.779
		(2.07)	(1.06)	(2.69)	(3.81)	(2.88)	(6.16)	(−2.52)	(0.77)
UAV	-	-0.031 * *	-0.008	-0.186 * *	-0.108	-0.995 * *	-0.087	0.121 * **	0.090 * *
		(−2.18)	(−0.32)	(−2.14)	(−0.17)	(−2.01)	(−0.45)	(3.33)	(2.11)
CEOpower	-	-0.026 * **	-0.007 * **	-0.022	-0.013 * **	0.042 * *	-0.014 *	0.141 * *	0.104
		(−2.92)	(−2.83)	(−0.94)	(−2.95)	(2.01)	(−1.75)	(2.19)	(0.61)
CEOpower*IND	+	0.034 * **	-0.010	0.583 *	-0.204 *	0.087 * *	-0.008	-0.124 *	-0.201
		(3.50)	(−1.25)	(1.75)	(−1.69)	(1.99)	(−1.08)	(−1.72)	(−0.01)
CEOpower*UAV	-	-0.029 * *	-0.006	-0.106 * *	0.089	-0.040 * **	0.008	0.098 * **	0.065
		(−2.97)	(−0.52)	(−2.21)	(0.04)	(−3.24)	(1.05)	(3.10)	(0.54)
Overconfident	+	0.017 * **	-0.012	0.078 * **	-0.009	0.060 * **	-0.010	-0.052 * *	-0.014
		(3.29)	(−1.01)	(3.75)	(−0.02)	(3.58)	(−0.47)	(−2.12)	(−0.27)
Male	+	0.005	0.001	0.069	0.080	0.050	0.038	-0.099	-0.040 *
		(0.24)	(0.32)	(0.77)	(0.61)	(0.82)	(0.91)	(−1.03)	(−1.89)
International Q	+	0.0244	-0.007	0.056	0.038	0.054	0.038	0.071	0.061
		(0.23)	(−0.54)	(1.30)	(0.74)	(1.08)	(1.01)	(1.53)	(1.17)
Internally	-	-0.042 * *	-0.002 *	-0.085	-0.046	-0.047	-0.030	0.069 *	0.010 * *
		(−2.51)	(−2.46)	(−0.25)	(−1.10)	(−1.28)	(−1.01)	(1.83)	(2.53)
H.Edu	-	-0.001 *	-0.001 *	-0.069 *	-0.047	-0.087 *	-0.021	0.010	0.073 * *
		(−1.85)	(−1.88)	(−1.87)	(−1.33)	(−1.87)	(−1.41)	(0.27)	(1.95)
Ownership	-/+	-0.039	-0.045	0.017	-0.260	0.010	-0.038	0.061 * *	0.031 *
		(−0.10)	(−0.08)	(0.12)	(−1.10)	(1.05)	(−1.54)	(2.04)	(1.81)
LgTenure	-	-0.004 * *	-0.003 *	-0.167 * *	-0.139	-0.140 * *	-0.095	-0.185	0.170
		(−1.97)	(−1.80)	(−2.54)	(−0.98)	(−2.41)	(−1.00)	(−1.60)	(1.17)
Age	-	-0.0075 * *	-0.005 *	-0.003 * *	-0.008 * *	-0.010 * *	-0.002	0.003	0.002 * *
		(−2.17)	(−1.82)	(−2.31)	(−2.03)	(−2.10)	(−1.28)	(1.19)	(2.08)
Size	-	-0.016 * *	-0.025 * *	-0.355 * **	-0.316 * **	-0.110 * **	-0.081 * **	0.247 * **	0.227 * **
		(−2.02)	(−2.47)	(−10.38)	(−7.66)	(−5.78)	(−5.04)	(6.45)	(5.62)
Capital	-	-0.037 * **	-0.019 * *	-0.017	-1.434 * *	-0.007 * *	-0.001	0.664 * **	0.324 * **
		(−2.63)	(−2.08)	(−0.03)	(−1.96)	(−2.07)	(−1.14)	(8.57)	(5.64)
Deposits	+	0.014 * **	0.004	0.010	0.080	-0.010	0.014	-0.582 * **	-0.584 * **
		(3.67)	(0.12)	(0.69)	(0.54)	(−1.08)	(0.01)	(−3.89)	(−8.44)
Q	-	-0.003 * **	-0.002 * **	-0.014 * *	-0.018 * **	-0.012 * **	-0.010 * **	-0.028	-0.020
		(−2.81)	(−2.71)	(−2.37)	(−2.58)	(−4.47)	(−3.00)	(−0.69)	(−0.60)
CR	-	-0.013 * *	-0.005 *	-0.005 * *	0.014	-0.012 * *	0.010	0.061 * *	0.052 *
		(−2.70)	(−1.94)	(−2.23)	(0.45)	(−2.41)	(0.01)	(2.39)	(1.72)
CommonLaw	-	-0.035 * **	0.005	0.056	-0.022	0.039	-0.010	-0.045	-0.031
		(−2.75)	(0.30)	(1.00)	(−0.33)	(1.42)	(−1.05)	(−0.69)	(−0.50)
Corruption	+	0.002 * **	0.002 * **	0.052 * **	0.020	0.039 * **	0.008	-0.038 * **	-0.040 * **
		(8.10)	(5.28)	(4.66)	(1.49)	(3.50)	(1.17)	(−3.01)	(−2.98)
GDPgr	-/+	0.002 * *	-0.003	0.086 * *	-0.005	0.011 * **	-0.004	-0.265 * **	-0.241 * **
		(2.01)	(−0.30)	(2.19)	(−0.12)	(3.81)	(−1.05)	(−5.96)	(−6.13)
Government Inst.	-	-0.004 * *	-0.003 *	-0.148 * *	-0.101	-0.012 * *	0.009	0.194	0.161
		(−2.31)	(−1.89)	(−2.32)	(−1.32)	(1.89)	(0.02)	(1.54)	(1.04)
Constant		0.013	0.017	-0.765 * **	-0.343 * **	-0.045 * **	-0.041 * **	0.899 * **	0.903 * **
		(1.34)	(1.58)	(−4.25)	(−2.93)	(−5.51)	(−3.20)	(6.39)	(6.49)
Wald-Chi2		1182.05	1166.87	1422.25	1160.55	1112.00	1124.12	2077.01	2462.90
R-squared		0.19	0.16	0.49	0.40	0.44	0.30	0.46	0.41
N		1779	934	1779	934	1779	934	1779	934

This table presents the results for the generalized least squares random effect (GLS RE) using Eq. (1). We split our sample into tight and loose cultures. A culture is classified as tight (weak) if its tightness score, as reported in Gelfand et al. (2011), is above (below) the mean of tightness score of the broader sample. All variables are defined in Table 1. Between R-squared (R-squared) and Wald test (Wald-Chi2). Year dummies are included in all models. The figures in parentheses are t-statistics. * ** , * *, and * represent significance at 1%, 5%, and 10% respectively.

CEO power on bank risk is also supported after controlling for heteroscedasticity. The results for the interaction coefficients maintain the same sign as those reported in Panel A of Table 4, except those for insolvency risk (*LnZ*), which are no longer significant. In addition, as bank-year observations are different across our countries, it is possible that the results are biased on the weight of countries. To address this issue, in Panel B (Models 5–8), we conduct the weighted least squares (WLS) regressions ensuring that each country receives equal weight in the estimation. However, the results remain qualitatively unchanged.

Finally, we extend the analysis to consider a multi-level modeling approach (e.g., Peterson et al., 2012). Our data structure is multilevel, where the set of firms within countries forms the base-level observations, which are nested in 48 countries that form the higher-level observations. If the perceived levels of bank risk-taking are nested in the country, ignoring the multilevel nature of the data will lead to underestimated standard errors, which is particularly severe for coefficients on country-level determinants (Zheng et al., 2013). To address this issue, we follow Peterson et al. (2012) and Griffin et al. (2018) and estimate a hierarchical linear model (HLM) specification.[15] The results are reported in the Online Appendix (Table X2, Panel A), which are qualitatively similar. Within countries, our results are also consistent with the results

[15] The main benefit of using hierarchical linear modeling, for part of the analysis in this paper, is that the approach enables us to isolate the effects of bank-level and country-level variables. However, the drawback we have faced in using this approach is that we could not implement fixed effects because it removes all variations between higher level units from parameter estimation (see Bryan and Jenkins, 2015).

earlier reported in Table 4 (Panel A).[16]

4.3.2. The validity of the cultural measures

We use alternative cultural indexes from the GLOBE database (House et al., 2004) and Schwartz's (2006, 2008) cultural dimensions to explore the sensitivity of the results to alternative measures of cultural dimensions. GLOBE's institutional individualism and uncertainty avoidance are the alternative measures to Hofstede's individualism and uncertainty avoidance, respectively.[17] The results in Panel A, Table 6, suggest that the effect of national culture on bank risk-taking is generally robust to alternative measures of culture. All respective coefficients maintain the same sign as those reported in Table 4 (Panel A) for the Hofstede measures.

Schwartz (2008) updates cultural dimensions for 80 countries compared to 38 countries in 1994, motivated by an earlier conceptual and theoretical paper (Schwartz, 2006). Following Ahern et al. (2015), we use autonomy versus embeddedness dimension similarly to Hofstede's individualism dimension. Autonomous societies believe identities are unique to the individual. Harmony versus mastery is used as an alternative dimension for Hofstede's uncertainty avoidance. The results are reported in Table 6, Panel B.[18] The findings are consistent with our main results in Table 4 (Panel A).

4.3.3. Other robustness checks

To address whether the main findings are biased by omitted institutional variables, we add variables for deposit insurance (Demirgüç-Kunt et al., 2008). Deposit insurance is a dummy variable equal to one where there is explicit deposit insurance (Demirgüç-Kunt et al., 2008). We also control for inflation rates to capture the monetary instability in a country, indicating that inflation rates are higher in countries with underdeveloped financial systems, and hence experience financial crises (Demirgüç-Kunt and Maksimovic, 1996; Li et al., 2013). The results are reported in Table 7 (Panel A) suggesting that the impact of national culture and CEO power on bank risk-taking is consistent with our earlier findings.[19] In addition, we find, but not reported for brevity, a positive relationship between bank risk and deposit insurance which is consistent with the argument by Merton (1977) that banks in countries with deposit insurance could involve themselves in more risk-taking activities. The results for inflation rates indicate that bank risk-taking is higher when inflation rates increase.

We also address the issue that our results are sensitive to a particular type of bank. Therefore, we re-run the regressions only for commercial banks, as reported in Table 7 (Panel B).[20] The results are qualitatively similar, suggesting that the individualism dimension of national culture has a moderating influence while the uncertainty avoidance dimension has a reinforcing effect on the relationship between CEO power and bank risk-taking.

We test for an alternative measure of CEO power in Panel C. The relationship between CEO ownership and CEO power is substantiated by previous studies (e.g., Onali et al., 2016; Whidbee and Wohar, 1999). Following Onali et al. (2016), who argue that CEO ownership increases CEO power, we measure CEO power as the percentage of CEO equity stake in banks. Once again, the results are qualitatively similar and did not change significantly. Finally, since Japan has the highest proportion of firm-year observations in our sample accounting for 21% of the whole sample, in order to make sure that our findings are not dominated by this country, we re-run regressions after excluding observations of firms from Japan in Panel D. The coefficients remain significant and have the same sign as those in Table 4 (Panel A), suggesting that our results are not dependent on a specific country in our sample. We also control for firm heterogeneity by using bank dummy variables in Panel E which shows that our results are qualitatively similar to our main findings in Table 4.[21]

4.3.4. Intra-cultural diversity

We follow existing studies on intra-country cultural diversity (Beugelsdijk et al., 2017; Gelfand et al., 2011) who show that some countries have tight cultures while other countries have loose cultures. Cultural tightness is defined as the strength of social norms and the degree of tolerance for deviant behavior. In societies with tight cultures, social norms are clear and reliably imposed and enforced, while in societies with loose cultures, social norms are usually unclear, and values are less restrictive and more heterogeneous. As argued by Beugelsdijk et al. (2017), Gelfand et al.'s (2011) study is relevant to cross-cultural research where the degree of tightness can affect the strength of the impact of country-level cultural values. We use Gelfand et al.'s (2011) tightness scores and split our sample into tight and loose cultures. A culture is classified as tight (weak) if its tightness score, as reported in Gelfand et al. (2011), is above (below) the mean of tightness score of the broader sample. As shown in the online Table 8, we find that the interaction variable *CEOpower*IDV* is negative and more pronounced in tight cultures, suggesting that the relationship between bank risk-taking and CEO power is stronger for banks located in individualistic societies with a higher level of cultural tightness. Similarly, we find that the coefficient of *CEOpower*UAI* is stronger in tight cultures. Our findings provide support to the notion of intra-country cultural diversity, consistent with the argument by Taras et al. (2016) that country is not the same as culture.

5. Conclusion

This paper seeks to contribute to the literature by examining whether national culture can help explain the conflicting evidence on the effect of CEO power on bank risk-taking. We argue that national culture matters, in the sense that risk-taking by large banks is mainly influenced by the interaction of national culture and CEO power.

The main conclusions of this paper derive from new findings that the individualism dimension of culture has a moderating influence on the relationship between CEO power and risk-taking, and the uncertainty avoidance dimension has a reinforcing effect. Our findings are robust to alternative empirical methods as well as alternative measures of national culture and bank risk-taking after controlling for bank-level characteristics, national-level characteristics, and possible impact of institutional settings and legislations. The findings can be applied to

[16] We also expand our data to multi-periods (1999–2003, 2004–2008, and 2009–2013). Period 2 and Period 3 are indicator variables for the second (2004–2008) and third (2009–2013) periods, respectively. For brevity, the results are not reported here but are available in the online Appendix (Table X2, Panel B).

[17] For individualism, 7 (which is the maximum score for collectivisms) minus House et al.'s (2004) cultural index on collectivism is calculated to find the score on individualism.

[18] Schwartz's (2008) cultural dimensions do not provide data for 6 countries in our sample, and hence the number of observations has reduced to 4710. We have also checked the availability of data suing the World Value Survey which does not provide data for 11 countries in our sample, reducing the observations to 3450. In addition, following Chen et al. (2015) and Ahern et al. (2015), the World Value Survey does not provide an index similar to the uncertainty avoidance dimension of Hofstede. Hence, overall, we do not use the World Value Survey, given the stated limitations. However, we thank the referee for suggesting the World Value Survey.

[19] For brevity, the results are only reported for main variables; they are available, on request.

[20] We checked the history of banks in Orbis Bank Focus to distinguish commercial banks from other types of banks.

[21] We also examine if the results are sensitive to sample selection. The sample is split into European and non-European as well as developed and non-developed countries. The results are qualitatively similar to those results reported in Table 4 (Panel A), suggesting that our evidence is not driven by the European and developed countries.

improve risk management in the banking sector, with an emphasis on national culture in considering multinational expansions. We further partition and isolate national cultures into 'tight' cultures (typified by strong social norms and strict enforcement of rules) and 'loose' cultures (characterized by lax norms and heterogeneous values); we uncover a new finding that the former type of culture is more pronounced than the latter, in the relationship with bank risk-taking.

Data Availability

Data will be made available on request.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.jfs.2023.101133.

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