

# Culture dimensions and application of IFRSs in the banking industry

ANA ISABEL LOPES

Business Research Unit (BRU-IUL)

Instituto Universitário de Lisboa (ISCTE-IUL)

Av das Forças Armadas, Ed. II, D506, 1649-026 Lisboa

PORTUGAL

Ana.isabel.lopes@iscte.pt <https://ciencia.iscte-iul.pt/public/person/aidls>

**Abstract:** - Using European and Asian banks, this paper investigates how differences in culture in different countries can be related with Loan loss provisions (LLP) based on the Hofstede's theory. The effect of the application of International Financial Reporting Standards (IFRSs) on the amount of LLP recognized in financial statements published by Banks is also under analysis. Findings suggest that some culture dimensions play a role when analyzing risk factors, but not in all situations. When scores based on characteristics and behavior attributable to national culture are conflicting, the influence of culture on loan loss provisions is rejected. However, the application of IFRSs (vs local GAAP) has an important role, changing the power of national culture to influence the levels of LLP in countries where the scores of culture dimensions are according to the theory, and mitigating that influence when the scores are conflicting, moderating the amount of LLP that Banks should report regardless of culture behavior.

*Key-Words:* Loan loss provisions; Banking industry; Hofstede' culture dimensions; IFRS

## 1 Introduction

Accounting scholars, policy-makers and a wide range of researchers have been for long periods recognizing that credit risk is one of the most important risk factor for the banking industry. The amount of loans is an important asset for banks, assuming the claim to reimbursements and related interest. When this principle is not respected by borrowers the credit relationship is weakened, and the economic and the financial performance of banks come reduced. Banking and accounting regulators are accompanying this phenomenon with attention, especially when the financial crisis started. To face that risk banks set up reserves (allowances) through loan losses provisions. Theoretically speaking, LLP are anticipations of a prospective loss on a loan account.

Prior research found that managers use LLP for income smoothing [1], for meeting restrictions imposed by debt covenants [2], for mandatory capital requirements or to manage earnings [3][4][5][6][7], to better dispose of securities [8][9][10][11][12], for signaling [10], among other incentives. A related set of studies also focuses on the determinants of loan loss provisions. Loan quality and economic conditions ([13], loan growth [14], Bank size [15], accounting specific factors [16][17], asset risk, capital adequacy ratios and pre-loan loss profits [6] as well as macroeconomics

factors [18][19][20][14][16][17] are some of the conditions and factors appointed by well-established literature.

A recent study by Dahl [21] found that target levels of provisions for banks in different categories (small/big banks, commercial/real estate/consumer loan concentration, and high/low capital ratios) are established on the basis of a compromise among reporting preferences of bankers, accountants and regulators. Balla and McKenna [22] justified that bankers want flexibility, accountant setters look for transparency, and regulators desire safety and soundness. LLP are, thus, a consequence of prudential rules imposed by national monetary authorities (e.g., central banks), international monetary authorities (e.g., Basel agreements) and accounting setters (e.g., international or local standards). The amount of LLP can also have an impact on bank capital ratios, which, in turns, may be subject to changes through time, for several reasons, including changes in Basel standards, world economic conditions and public policies [17].

Besides the extensive literature previously referred, it is hard to find studies exploring the *National Culture* of a country as a factor to explain the amount of LLP presented by Banks. One exception is the recent empirical research of Kanagaretnam, Kim and Lobo [23] that used Hofstede's culture dimensions theory to observe its

influence on accounting conservatism and risk taking in the banking industry. An extensive literature also used Hofstede's culture dimensions to examine its influence on business environments and accounting [24][25], in economics [26] and in finance [27] among others authors and business areas. Particularly, national culture was used in studies on development of accounting systems [28] [29], on earnings management in several industries except banking [30] [31], on accounting conservatism [25] [32] [33] [34]. A survey accompanied in early 2008 by PricewaterhouseCoopers and the Economist Intelligence Unit on the factors that created conditions for the recent Banking crises [35] also reveals that around 73% of survey participants identified "culture and excessive risk-taking" as their major causes.

Our paper is most closely related to Kanagaretnam et al [10] [23] and can be considered as an emerging or complementary body of empirical research investigating how national culture affect loan losses provisions across countries in the banking industry. Usually banks are excluded from other studies [30] [31] but loan loss accounting in this industry is a proper setting to observe the preferences of managers for conservative accounting [36]. I use two dimensions of national culture identified by Hofstede (2001), namely, individualism (IDV) and uncertainty avoidance (UA) to relate with accounting conservatism and risk-taking. These two dimensions were used by, Kanagaretnam et al. [23] and Chen et al. [37], among others. Findings show that: i) banks in countries less individualists and more adverse to risk report earnings more conservatively and exhibit lower levels of risk-taking than banks in higher individualist and more risky countries [23]; ii) individualism is significantly negatively correlated with corporate cash holdings and uncertainty-avoidance is positively correlated with corporate cash holdings [37]. My paper adds to [23]. First, I create a new dataset with European and Asian countries and based on Hofstede's culture dimensions I split those countries whose scores for individualism are similar to the scores of risk avoidance. Second, I use this database to analyze if the effect of national culture is moderated by the application of International Financial Accounting Standards (IFRSs) instead of local standards (local GAAP).

The rest of the paper proceeds as follows. Section 2 discusses the arguments for which culture dimensions can influence accounting conservatism

and risk-taking in the banking industry and why IFRSs are important to industry banking and loan loss provisions. Section 3 develops the hypotheses. Chapter 4 presents the research data and design, and results are reported in chapter 5. Chapter 6 concludes.

## **2 The influence of national culture on loan losses provisions, the application of IFRS and hypotheses**

### **2.1 National Culture**

Hofstede's cultural dimension theory, published in 2001, offers a framework for cross-cultural comparisons that has been widely used in several fields as a paradigm for research. Each country is scored using a scale of roughly 0 to 100 for each dimension. The higher the score, the more that dimension is exhibited in society.

Prior works applying this theory to earnings management, conservatism accounting and risk taken [31] [10] [23] found consistent results for Individualism (IDV) and Uncertainty/Avoidance Index (UAI), demonstrating that individualism and uncertainty avoidance dimensions of national culture affect risk-taking. I will also use these two dimensions.

According to theory, IDV measures the degree to which individuals are integrated into groups (without political meaning). Countries with high scores for IDV dimension, usually foster contractual relationships that are based on the principles of exchange, value independence and self-sufficiency, place self-interests above collective interests, enjoy challenges and expect rewards for hard work, and accept confrontation as an attribute (Hofstede, 2001). With low scores for IDV, countries behave according to social norms that are designed to maintain social harmony among members of an in-group, and consider implications of their actions for wider collective and share resources, and are prepared to sacrifice personal interest for collective interests (Hofstede, 2001). It can be argued that risk-taking incentives are likely greater in High IND societies where worry for other stakeholders' welfare is likely to be low [23].

The UAI measures the degree to which members of a society are able to cope with the uncertainty of the future without experiencing undue stress. Weak UAI is characterized, among others, by risk taking, flexibility, organizations with a relatively low degree of structure and few rules. Strong UAI is, by opposite, characterized by avoidance of risk, organizations that have clearly delineated structures,

many written rules, standardized procedures, and respect for authority (Hofstede, 2001).

These two dimensions of culture can be applied to our study in the following way. There is evidence [24] that banks take more risk in societies where IDV is high or UAI is low. Considering LLP as a proxy risk-taking, it is expected that banks in low IDV and high UAI societies recognize more conservative (i.e., larger) allowances for loan losses than banks in high IDV and low UAI societies. I will test this effect in an income statement item, the loan provision expensed in each year, since every time a bank increase loan loss allowances it records an expense and thus net income decreases.

A summary of these effects is presented in table 1, showing that geographies with a high score in IDV and a low score in UAI are more committed with risk-taking strategies, which in turns give us an expectation of a negative or a positive relation with LLP.

**TABLE 1: The effect of Individualism and Uncertainty/Avoidance Index on Risk-taking**

Scores	IDV	UAI
High	<ul style="list-style-type: none"> <li>• More risk-taking</li> </ul>	<ul style="list-style-type: none"> <li>• Less risk-taking</li> </ul>
Low	<ul style="list-style-type: none"> <li>• Less risk-taking</li> </ul>	<ul style="list-style-type: none"> <li>• More risk-taking</li> </ul>
	 Negative relation with LLP	 Positive relation with LLP

**2.2 International Financial Reporting Standards (IFRS)**

A lot of countries around the world have either fully adopted, or are considering to adopt, IFRSs. These include all member countries of the European Union and several other European and Asian countries. While many researches analyze the effect of the adoption of IFRSs excluding the impact on financial institutions, I consider that some issues must be highlighted by banks when adopting those IFRSs.

IFRSs can have a significant impact on the banking and capital markets industry. PricewaterhouseCoopers [38] anticipated in 2006 that this impact could include changes on earnings and capital volatility, on strategic and financial planning, on capital management, on credit evaluation tools, and on debt covenants, among others. One of the topics that is underlying all these impacts is the “Provision for Loan Losses”, since

this amount must be based upon the requirements of central Banks of each country, setting the minimum provisions to be held against lending assets. At the same time, some countries apply the Basel accords (I, II and III) to identify and fulfill some capital adequacy ratios, market liquidity tests and stress tests. Thus, banks that are listed in European stock exchanges have been mandated to compile their consolidated financial statements according to IFRSs (since 2005) and to compile with Basel II for capital requirements (since 2007). Under these considerations, two kinds of provisions can be addressed: i) the specific provision, that is directly a correction of a single loan; ii) the general provision, that includes group impairments recognized whenever observable data display a measurable decline in estimated future cash flows that cannot yet be allocated to a single loan.

The first case, specific provision, and according to the current version of IAS 39 still effective, the loan loss provision is the current period expense for loan losses recognized in that current period. It is reported in the profit or loss statement and likely influences the reported earnings of banks. This is consistent with the so-called “incurred loss model”, since LLP can be created only after the occurrence of an impairment trigger event for single financial assets. Gebhardt and Novotny-Farkas [39] examined how the application of the IAS 39 incurred loss approach affects the loan losses provisions, considered as the main operating accrual item of (commercial) banks. They found that IAS 39 rules significantly reduce discretionary behavior, as measured by less income smoothing after IFRS adoption. They also found that the IFRS adoption effect is significantly less pronounced in stricter supervisory regimes and in countries with more dispersed ownership of banks. The debate around changes to IAS 39 and IFRS 9 changed from an “incurred loss model” to an “expected credit loss model”. The change and the benefits or the cons against the transformation from one model to another are out of the scope of this research.

The second case, the general provision, is created for loan portfolios that were not subject to a specific provision (loans with similar features, e.g., collateralization), and requires that banks discriminate between the occurrence or not of a credit event.

Banks applying IFRSs and also banks applying local GAAP are found in Europe and in Asia. Not all of them comply with the Basel arrangements. I also want to analyze the influence of culture in loan losses provisions, controlling for banks either applying IFRSs or not.

### 2.3. Hypotheses

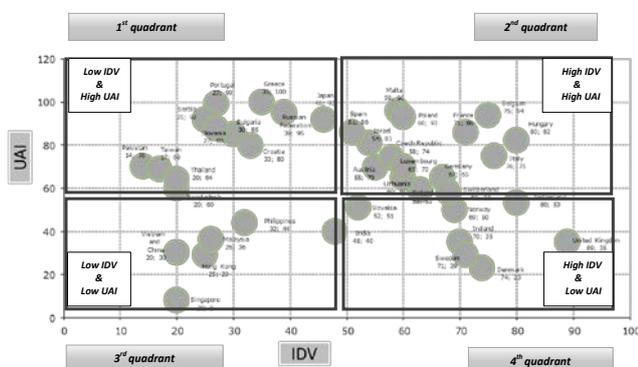
Based on prior literature, I examine whether national culture, particularly the characteristics of individualism (IDV) and uncertainty/avoidance index (UAI), results in an association with risk-taking through the use of loan loss provisions. I also examine whether this association is moderated by the application of IFRSs.

I pattern tests closely to prior studies that seek incentives or factors associated with the level of LLP presented by Banks (e.g., [16][23] [40] [41] [42]).

The proxies for national culture are Individualism (IDV) and Uncertainty/Avoidance Index (UAI). Countries belonging to Asia and to Europe have different scores for IDV and for UAI (Hofstede, 1980, 2001). Figure 1 draws a scatter placing European and Asian countries in quadrants that allows the comparison between different countries considering the pair of values for IDV and UAI. For example, United Kingdom is positioned as a country with high IDV and low UAI (4<sup>th</sup> quadrant) when compared to Serbia, with low IDV and high UAI (1<sup>st</sup> quadrant).

Kanagaretnam et al. [23] found that banks in countries with low (high) IDV (UAI) scores have an opposite relation with LLP when compared to countries in high (low) IDV (UAI) scores. This seems to be consistent with Hofstede’s theory, since countries with the lowest scores for IDV tend to have the highest for UAI, and vice-versa.

**Figure 1 - Individualism (IDV) and Uncertainty Avoidance (UAI) by country and by quadrants**



Based on theory, the first hypothesis to be tested is based on the influence of IDV and UAI on loan loss provisions:

*H1: In countries with lower (higher) scores of IDV (UAI) banks exhibit a negative (positive) association with loan losses provisions.*

I expect that the null is rejected (consistent with [23]). However, several countries have similar scores for both IDV and UAI, as appointed in Figure 1. To analyze if differences in the influence of national culture on LLP are moderated by the position of the country in one of the four quadrants (1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> or 4<sup>th</sup>) of figure 1, I test another hypothesis. The second hypothesis to be tested is related with the examination of the effect of national culture (IDV and UAI) when banks are from countries in which the scores for UAI and IDV either high or both low, namely:

*H2: When the scores for IDV and UAS are either high or both low, the association with loan loss provisions is different from low (high) IDV and high (low) UAS.*

As explained in prior section, the incurred loss approach to loan losses provisions were implemented by IAS 39 and only existed since 2005, coincident with the date from which IFRS became mandatory for listed companies, including those from banking industry. Because the compliance with IFRS can be a determinant for the amount of LLP presented by banks [39], I test an additional hypothesis to figure out if the association of national culture is moderated by the application of IFRSs as compared to banks that still continue to apply local standards. Our third hypothesis is:

*H3: The influence of national culture on risk-taking is different in countries applying IFRSs or local standards.*

## 3. Research design and data

### 3.1 Models for bank risk taking

The model to test hypothesis 1 (H1) related with the influence of national culture on the level of LLP presented by banks are adapted from [24] [39] [40]:

$$LLP = \beta_0 + \beta_1 IDV + \beta_2 UAI + \beta_3 BegNPL_{it} + \beta_4 \Delta NPL_{it} + \gamma VectorBanks + \vartheta VectorMacro + EUROPE + YEAR + \varepsilon_{it} \tag{1}$$

Where LLP is Loan Loss Provision expensed in Income Statement; IDV and UAI are the scores of Hofstede’s dimension cultures; BegNPL equals the

beginning balance of non-performing loans;  $\Delta NPL$  equals the change in non-performing loans ( $\Delta NPL_{it} = NPL_{it} - NPL_{it-1}$ ). All these explanatory variables are scaled by the market capitalization of equity to avoid scale bias.

Non-performing loans (beginning and changes) are included as main variable because a represent loans that are in default or close to being in default, which is (at least theoretically) associated with LLP, the dependent variable. Many loans become non-performing after being in default for 90 days, depending on the contract terms, and there is no unique definition widely used. If a bank has NPL, it shall recognize loans losses provisions (LLP) according to the rules of accounting regimes or supervisory regulators. Listed Banks in European Union are required to apply the International Financial Reporting Standards (IFRS), which contains specific guideline on how to estimate the impairment of financial assets and, consequently, the amount of LLP given the amount of NPL.

The *VectorBanks* and *VectorMacro* are a vector of specific characteristics of banks and a vector of macroeconomic conditions affecting each country, respectively. These vectors are included comprising several control variables that prior literature found could be associated with loan loss provision. *VectorBanks* includes: i) Size (SIZE), ii) Leverage (LEV), iii) Auditors from Big 4 (AUD), because LLP come under close scrutiny from bank auditors (Gebhardt and Novotny-Farkas, 2011); iv) cross-listed banks (XLIST), since a considerable number of banks in the sample are cross-listed in other European, Asian or US Stock exchanges, and accounting quality can be different for these banks relative to a matched sample of firms not cross-listed; and, v) Loan to deposit ratio.

The *VectorMacro* is a vector of macroeconomic conditions affecting each country. I control for [23]: i) creditor rights (CR) and information sharing (IS)

based on the findings of [43], ii) the degree to which law is fairly and effectively enforced in a country (ENFORCE), iii) Gross Domestic Product (LGPD) since countries with different income levels can be subject to sources of volatility affecting bank risk-taking [20].

Equation (1) also includes *EUROPE* as a control variable assuming 1 if the bank belongs to a European country and 0 if it is an Asian bank, as well as year-indicators (YEAR) to control for year fixed effects. Details of all the variables are presented in Table 2.

The main prediction is that  $\beta_1$  on IDV will be negative and  $\beta_2$  on UAI will be positive based on Hofstede's theory on dimension cultures. We expect also positive  $\beta_3$  and positive  $\beta_4$ , since European and Asian Banks can avoid the growth of LLP if they reduce the amount of non-performing loans. By other hand, the higher the amount of NPL, the higher the risk-taking of each bank, given its decision to grant (or not) credit to other parties after analyzing the probability of default of each borrower.

To test Hypothesis 2, I do the following. Firstly, I create a 2x2matrix of four subsamples partitions. I split all countries according to the pairs {IDV, UAI} and create four groups according to figure 1: i) 1<sup>st</sup> Quadrant, for the pairs low IDV and high UAI; ii) 2<sup>nd</sup> Quadrant, for the pairs high IDV and high UAI; iii) 3<sup>rd</sup> Quadrant, for the pairs with low IDV and low UAI; and iv) 4<sup>th</sup> Quadrant, for the pairs with high IDV and low UAI.

Secondly, the Equation (1) is then applied to 1<sup>st</sup> and 4<sup>th</sup> Quadrants, and then to 2<sup>nd</sup> and 3<sup>rd</sup>, since in these later the scores of national culture are conflicting. There are countries with both IDV and UAI high and countries with both IDV and UAI low.

**TABLE 2: Definition of variables**

Variable	Definition
<b>Dependent:</b>	
LLP	Loan Loss Provisions: the amount of provisions at the end of the year divided by market capitalization
<b>Independent:</b>	
IDV	Score for individualism from Hofstede (2001)
UAI	Score for uncertainty/avoidance index from Hofstede (2001)
BegNPL	Begging Balance of Non-Performing Loans divided by market capitalization
$\Delta NPL$	Change in Non-Performing loans at the end of year t minus Non-Performing loans at the end of year t-1
IFRS	1 if bank-year is applying IFRS; 0 otherwise

(cont.)

(cont.)	
HIGH	1 if the country has high IDV and high UAI scores; 0 otherwise
LOW	1 if the country has low IDV and low UAI scores; 0 otherwise
HighIDV	1 if the country has high IDV and low UAI; 0 otherwise
LowIDV	1 if the country has low IDV and high UAI; 0 otherwise
<i>Controls - Bank Specific:</i>	
Size	Log of total assets
LEV	Total debt divided by total assets at the end of the year
AUD	1 if the bank is audited by a Big4; 0 otherwise
XLIST	1 if the bank is listed in more than one stock exchange; 0 otherwise
LTD	Ratio Loan-to-deposits
<i>Controls - Macro and country specific:</i>	
CR	Index aggregating creditor rights, ranging from 0 to 4, used in [23] and originally included in [44] and updated in [45]
IS	Information sharing index equaling 1 if either a public registry or a private bureau operates in the country and 0 otherwise, used [23] and originally [45]
LGPD	Log of GDP per capita, used in [23] and originally from World Development Indicators and Global Development Finance database
ENFORCE	Law enforcement index ranging from 0 (lower) to 10 (greater law enforcement), used by [23] and originally from the Economic Freedom of the World: 2010 Annual Report.
EUROPE	1 for European countries and 0 for Asian countries

So, according to the theory, a country with high IDV must have low UAI if conclusions about the impact on LLP want to be addressed. It is important to understand what happens if the scores are similar (either high or low).

Hypothesis 3 (H3) is tested adding a new dummy variable, IFRS, assuming 1 (0) for bank-year observations applying IFRSs (local GAAP). Equation (2) is adapted from Equation (1), as follows:

$$LLP = \delta_0 + \delta_1 IDV + \delta_2 UAI + \delta_3 IFRS + \delta_4 IFRS * IDV + \delta_5 IFRS * UAI + \delta_6 BegNPLit + \delta_7 \Delta NPLit + \gamma VectorBanks + \vartheta VectorMacro + EUROPE + YEAR + \varepsilon_{it} \quad (2)$$

The interaction terms  $IFRS * IDV$  and  $IFRS * UAI$  are our main variable of interest. They will also be tested after the split of the sample into four Quadrants, fitting together 1<sup>st</sup> and 4<sup>th</sup>, and then 2<sup>nd</sup> and 3<sup>rd</sup>, similarly to Equation (1). No predictions are made.

### 3.2 Sample Selection

Using Thomson Reuters Database (datastream), I extract data on all European and Asian listed banks for which data in Worlscope was available. These two large geographies are of main concern because of the interests and development of economies such

as China, Russian Federation, and European Union, with a diversity of countries distinguished by different type of societies. The culture dimension measures, IDV and UAI, were obtained on cultural database in the Hofstede Centre website (<http://geert-hofstede.com/>). Other country-level institutional variables are obtained from Kanagaretnam et al (2014) and related literature.

The sample starts out with 43 countries, but Ukraine and Cyprus were excluded because these two countries are not included in the Hofstede's cultures measures. For the remaining 41 countries, I downloaded all the bank-years between 2005 and 2012, which yielded a population of 594 banks and 4,159 bank-years observations. I loss 126 banks and 884 bank-years due to lack of information on the Database for all the variables needed. I also removed all the observations with studentized residuals higher than |2|. Bangladesh, Bulgaria, Czech Republic, Luxembourg, Malta and Vietnam were dropped.

The final sample consists of a maximum of 2,392 bank-years observations, split between 12 Asian countries with 1,529 bank-years observations and 23 European countries with 863 bank-years observations. About 82% (n=1,250) of the total Asian bank-years observations (n= 1,529) use local standards and around 83% (n=715) of the total European bank-years (n=863) apply IFRS. Table 3 displays information with the list of countries included in the sample and a set of institutional variables assigned to them.

**Table 3 – Sample Description**

Country	Asia (0) or Europe (1)	IDV	UAI	CR	IS	ENFORCE
Austria	1	55	70	3	1	6.70
Belgium	1	75	94	2	1	5.60
China	0	20	30	2	0	6.73
Croatia	1	33	80	3	0	5.40
Denmark	1	74	23	3	1	6.19
Finland	1	63	59	1	1	8.06
France	1	71	86	0	1	6.91
Germany	1	67	65	3	1	6.62
Greece	1	35	100	1	1	4.13
Hong Kong	0	25	29	4	1	7.69
Hungary	1	80	82	1	1	7.15
India	0	48	40	2	0	2.59
Ireland	1	70	35	1	1	4.95
Israel	0	54	81	3	1	3.46
Italy	1	76	75	2	1	3.18
Japan	0	46	92	2	1	6.37
Lithuania	1	60	65	2	1	7.45
Malaysia	0	26	36	3	1	4.27
Netherlands	1	80	53	3	1	5.11
Norway	1	69	50	2	1	7.53
Pakistan	0	14	70	1	1	3.55
Philippines	0	32	44	1	1	3.42
Poland	1	60	93	1	0	4.27
Portugal	1	27	99	1	1	5.25
Russian Fed.	0	39	95	2	0	7.53
Serbia	1	25	92	2	0	3.95
Singapore	0	20	8	3	0	8.48
Slovakia	1	52	51	2	1	4.64
Slovenia	1	27	88	3	1	3.87
Spain	1	51	86	2	1	5.54
Sweden	1	71	29	1	1	4.73
Switzerland	1	68	58	1	1	6.03
Taiwan	0	17	69	2	1	5.55
Thailand	0	20	64	2	0	6.11
United Kingdom	1	89	35	4	1	6

The second column identifies if it is a European or Asian county. The third and fourth columns show the measures for our two dimensions of culture, IDV and UAI. The fifth to seventh columns shows the indexes for our country specific variable controls as defined in Table 2. The last two columns show the number of banks and bank-year observations assigned to each country included in our sample.

### 3.3 Descriptive statistics

Table 4 presents descriptive statistics for the continuous variables used in our multivariate analyses. The mean (median) of loan losses provisions is about 8% of the market capitalization of the bank. The negative minimum values reveal that in some bank-year observations the bank recorded reversals higher than the recorded provision in the income statement.

**Table 4 - Descriptive statistics of continuous variables**

	<i>LLP</i>	<i>NPL</i>	<i>BegNPL</i>	<i>ΔNPL</i>
Mean	0.0895965	0.7713293	0.6481556	0.1226448
Median	0.0401544	0.2939879	0.2794175	0.0000001
Std. Deviation	0.1630924	2.853.858	2.185.411	19.575.962
Minimum	-1.104.033	0.00000	0.00000	-2.234.643
Maximum	1.969.466	7.061.092	7.061.092	6.275.361
p25	0.01319133	0.0938559	0.0920613	-0.0462622
p50	0.04015445	0.2939879	0.2794175	0.0000001
p75	0.10134127	0.7030076	0.6534656	0.0802906
N	2,392	2,389	2,392	2,389

Note: See definition of variables in Table 2.

Table 5, Panel A shows Pearson correlations between the LLP and the continuous independent and control variables; Panel B presents the Spearman rank correlations between LLP and categorical or binary control variables and macro and country specific variables. Loan Loss provisions (LLP) have a positive correlation with non-performing loans, either the beginning (BegNPL) or the change ( $\Delta$ NPL) at the year. This in in the line with the way as LLP is estimated according to

accounting standards or Basel Agreements. The correlation between LLP and the variables of national culture (UAI and IDV), geographies (Europe) and accounting regimes (IFRS) are significantly positive suggesting that banks in Europe, or applying IFRSs, or with higher scores of IDV or UAI have higher amount of LLP. The relation between IDV with LLP and UAI would be opposite according to Hofstede's theory.

**Table 5 - Pearson and Spearman rank correlation****Panel A: Pearson correlations between loan loss provisions and continuous variables**

	<i>LLP</i>	<i>BegNPL</i>	<i>ΔNPL</i>	<i>Size</i>	<i>LEV</i>	<i>LTD</i>
<i>LLP</i>	1					
<i>BegNPL</i>	0.268**	1				
<i>ΔNPL</i>	0.268**	-0.055**	1			
<i>Size</i>	-0.025	-0.016	0.012	1		
<i>LEV</i>	0.071**	0.108**	0.025	0.341**	1	
<i>LTD</i>	0.134**	0.043*	0.052*	0.087**	-0.024	1

**Panel B: Spearman correlations between loan loss provisions and categorical and binary variables**

	<i>LLP</i>	<i>IDV</i>	<i>UAI</i>	<i>IFRS</i>	<i>Europe</i>	<i>AUD</i>	<i>XLIST</i>	<i>CR</i>	<i>IS</i>	<i>ENFORCE</i>	<i>LGPD</i>
<i>LLP</i>	1.000										
<i>IDV</i>	0.047*	1.000									
<i>UAI</i>	0.060**	-0.034	1.000								
<i>IFRS</i>	0.131**	0.417**	-0.031	1.000							
<i>Europe</i>	0.049*	0.758**	0.024	0.668**	1.000						
<i>AUD</i>	-0.113**	-0.077**	0.310**	0.235**	0.264**	1.000					
<i>XLIST</i>	-0.108**	0.193**	0.000	-0.033	0.131**	0.020	1.000				
<i>CR</i>	0.087**	-0.031	-0.254**	-0.168**	-0.240**	-0.037	-0.060**	1.000			
<i>IS</i>	-0.083**	0.104**	0.316**	0.082**	0.274**	0.520**	0.033	-0.064**	1.000		
<i>ENFORCE</i>	-0.153**	-0.066**	0.187**	0.080**	0.046*	0.518**	-0.013	0.170**	0.257**	1.000	
<i>LGPD</i>	-0.200**	0.259**	0.429**	-0.067**	0.187**	0.495**	0.114**	0.155**	0.629**	0.668**	1.000

Note: See definition of variables in Table 2.

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

## 4 Results

### *Testing the culture dimension between groups*

I start by examining whether loan loss provisions (LLP) and selected independent variables (NPL, BegNPL and  $\Delta$ NPL) are similar or different between independent groups. Table 6 presents the findings. Panel A exposes the outcome for Mann-Whitney U test comparing the median between unrelated groups: i) accounting regimes (IFRSs *versus* local GAAP); ii) geographies (Europe *versus* Asia). Findings show that there is enough evidence to conclude that there is a difference in the median of all the variables selected to the test comparing the banks applying IFRSs and local GAAP, as well as banks in European countries and Asian countries.

Panel B reveals the outcome for the non-parametric test comparing the distribution of LLP in each Quadrant (figure 1) with the other three possible positions in different Quadrants.

The findings suggest that the median of LLP is not equal when IDV is high, regardless of UAI being high or low (2<sup>nd</sup> and 4<sup>th</sup> quadrant of figure 1, since the null hypothesis was rejected). By opposite, the null of the equality of the medians is retained when IDV is low, regardless of UAI being high or low (1<sup>st</sup> and 3<sup>rd</sup> quadrant of figure 1).

These findings are important and sustain the influence of national culture on the level of LLP presented by the banking industry, supporting the prior findings of [23] and advancing that banks' risk-taking strategies inherent to characteristics associated with individualism seems to more heavily justify differences in LLP cross different countries than banks' risk-taking strategies inherent to

characteristics associated with uncertainty/avoidance index.

### *The effect of culture and of IFRSs on Loan Losses Provisions*

Panel A of Table 7 shows the results when LLP is used as dependent variable, testing the effect of culture on loans less provisions. The findings in the panel A include outcomes of Equation (1).

The coefficients for IDV and for UAI (column Hypothesis 1, Equation 1) are negative ( $\beta=-0.001$ ) and positive ( $\beta=0.001$ ), both significant at 1% level, as expected, confirming prior results of Kanagaretnam et al, 2014. The coefficients for Non-performing loans (BegNPL and  $\Delta$ NPL) are also positive, consistent with the fact that the higher the credit (near) in default, the higher the amount expensed as provisions.

When equation (1) is tested over different Quadrants (column Hypothesis 2), through the 2x2 matrix, the coefficients for IDV and for UAI deserve attention. Under the 1<sup>st</sup> and the 4<sup>th</sup> Quadrants the coefficients on IDV and on UAI are consistent with theory, and with prior column. However, under the 2<sup>nd</sup> and 3<sup>rd</sup> Quadrants, the coefficients on IDV and on UAI loose statistical significance, whereas the coefficients on the other main variables remain consistent with prior finding for the pooled sample. This result can be important for future research, due to diversity on the position of countries according to conflicting scores for culture behavior. Culture seems not playing a role when the scores for IDV and UAI are both either low or high.

**Table 6 – Non-parametric test to compare independent groups**

**Panel A: Loans loss provisions and non-performing loans across different geographies and accounting regimes**

	Non-parametric tests: Independent-samples Mann-Whitney U test			
	<i>Accounting regimes</i>		<i>Geographies</i>	
	IFRS vs local GAAP		Europe vs Asia	
	<i>Sig.</i>	<i>Decision</i>	<i>Sig.</i>	<i>Decision</i>
The distribution of LLP is the same	0.000	Reject the null	0,017	Reject the null
The distribution of $\Delta$ NPL is the same	0.000	Reject the null	0,014	Reject the null
The distribution of BegNPL is the same	0.000	Reject the null	0	Reject the null
The distribution of NPL is the same	0.000	Reject the null	0	Reject the null

(Cont.)

(cont.)

**Panel B: loans loss provisions across different categories of national culture**

Quadrant (figure 1)	Non-parametric tests: Independent-samples Mann-Whitney U test	
	Distribution of LLP according to national culture	
	<i>Sig.</i>	<i>Decision</i>
1 <sup>st</sup> : Low IDV & High UAI Vs other categories	0.923	Retain the null
2 <sup>nd</sup> : High IDV & High UA Vs other categories I	0.000	Reject the null
3 <sup>rd</sup> : Low IDV & Low UAI Vs other categories	0.564	Retain the null
4 <sup>th</sup> : High IDV & Low UAI Vs other categories	0.000	Reject the null

Note: See definition of variables in Table 2.

**Table 7: Results**

Panel B: Relation between national culture and loan loss provisions									
Hypothesis 1				Hypothesis 2					
Equation (1)				Equation (1) - split					
				QUADRANT=1st and 4th High IDV & Low UAI Low IDV & High UAI			QUADRANT=2nd and 3rd High IDV & High UAI Low IDV and Low UAI		
	<i>Coef.</i>	<i>t-test</i>	<i>p-value</i>	<i>Coef.</i>	<i>t-test</i>	<i>p-value</i>	<i>Coef.</i>	<i>t-test</i>	<i>p-value</i>
<i>(Constant)</i>	-.341	-3.709	.000	.051	.377	.706	-.207	-2.159	.031
<i>IDV</i>	-.001	-3.385	.001	-.002	-4.432	.000	.000	0.588	.557
<i>UAI</i>	.001	5.325	.000	.001	1.680	.093	.000	0.783	.434
<i>BegNPL</i>	.019	13.407	.000	.026	6.180	.000	.018	13.106	.000
<i>ΔNPL</i>	.021	13.663	.000	.031	7.349	.000	.018	12.069	.000
<i>SIZE</i>	-.008	-1.821	.069	-.015	-2.035	.042	-.016	-2.425	.015
<i>LEV</i>	.556	5.138	.000	.285	1.657	.098	1.362	7.885	.000
<i>AUD</i>	-.014	-1.101	.271	.011	.427	.005	.005	.311	.775
<i>XLIST</i>	-.014	-1.700	.089	-.015	-1.292	.197	-.001	-0.082	.935
<i>LTD</i>	.019	3.731	.000	.020	3.970	.000	.022	4.130	.000
<i>CR</i>	.039	7.711	.000	.065	7.653	.000	.031	6.837	.000
<i>IS</i>	.019	1.663	.097	-1.162	-3.960	.000	.027	2.079	.038
<i>ENFORCE</i>	-.002	-.627	.531	-.031	-3.359	.001	.001	.206	.837
<i>LGPD</i>	-.022	-4.225	.000	.010	1.186	.232	-.009	-1.022	.307
<i>EUROPE</i>	.094	7.995	.000	.133	7.443	.000	.026	1.070	.285
<i>YEAR</i>		Included			Included			Included	
<i>Adjusted R<sup>2</sup></i>		0.223			0.196			0.215	
<i>N. observations</i>		2,387			1,290			1,097	

(Cont.)

(Cont.)

**Panel B: Relation between national culture and loan loss provisions interacted with the application of IFRS**

<b>Hypothesis 3</b>									
Equation (2)				Equation (2) - split					
				QUADRANT=1st and 4th			QUADRANT=2nd and 3rd		
	Coef.	t-test	p-value	Coef.	t-test	p-value	Coef.	t-test	p-value
<i>(Constant)</i>	-.334	-3.570	.000	-.321	-3.444	.001	-1.157	-6.790	.000
<i>IDV</i>	-.001	-2.934	.003	.003	2.626	.009	-0.001	-.751	.453
<i>UAI</i>	.001	2.100	.036	-.005	-4.910	.001	.002	2.606	.009
<i>IFRS</i>	-.042	-1.638	.102	-.230	-2.372	.018	-0.013	-.303	.762
<i>IFRS*IDV</i>	.000	1.488	.137	.001	1.389	.165	.003	2.753	.006
<i>IFRS*UAI</i>	.001	1.823	.068	.003	2.742	.006	-.002	3.145	.002
<i>BegNPL</i>	.019	13.354	.000	.024	5.674	.000	.017	12.452	.000
$\Delta$ <i>NPL</i>	.021	13.34	.000	.030	7.096	.000	.018	11.710	.000
<i>SIZE</i>	-.011	-2.293	.022	-.020	-2.678	.000	-.012	-1.735	.083
<i>LEV</i>	.626	5.607	.000	.315	1.848	.065	1.436	8.240	.000
<i>AUD</i>	-.016	-1.224	.221	.019	.744	.457	-.011	-.678	.498
<i>XLIST</i>	-.013	-1.581	.114	-.008	-.686	.493	.008	-.710	.478
<i>LTD</i>	-.015	-1.152	.250	-.004	-.355	.723	.006	.482	.630
<i>CR</i>	.035	6.689	.000	.010	.808	.419	.004	.523	.601
<i>IS</i>	.021	1.718	.086	-.046	-.947	.344	.026	1.771	.077
<i>ENFORCE</i>	-.001	-2.083	.777	.000	-0.017	.987	.000	-.007	.995
<i>LGPD</i>	-.019	-3.411	.001	-.003	-.266	.790	-.006	-.537	.591
<i>EUROPE</i>	.076	4.768	.000	.163	3.581	.000	.084	2.753	.006
<i>YEAR</i>	Included			Included			Included		
<i>Adjusted R<sup>2</sup></i>	0.220			0.219			0.36		
<i>N. observations</i>	2,387			1,290			1,097		

Note: See definition of variables in Table 2.

Panel B presents the relation between national culture and loan loss provisions interacted with the application of IFRSs by European and Asian Banks based on Equation (2), an extended version of Equation (1).

The column entitled Equation (2) reports similar results as equation (1): i) the coefficients on IND and UAI are negatively and positively associated with LLP respectively; ii) the variables on Nonperformance loans ((*BegNPL* and  $\Delta$ *NPL*) are also consistent with Panel A. The dummy variable IFRS and interaction with IND are not statistically significant, being statistical significant for UAI at 10% level, reinforcing the positive association of UAI with LLP when Banks apply IFRS. This is consistent with the role of IFRS, because IAS 39 forces the recognition of provisions (impairments) over the amount of loans near to default.

The column entitled Equation (2) – split is of extreme importance, given the application of this Equation to countries in different Quadrants, using a similar methodology as in Panel B. Under the 1<sup>st</sup> and the 4<sup>th</sup> Quadrants the coefficients on IDV ( $\beta=0.003$ ) and on UAI ( $\beta=-0.005$ ) are the opposite from prior column, from Panel A, and from the

theory, whereas IFRS plays a determinant role. If the use of IFRS is included in the model, the association of IND (UAI) with LLP changes from negative (positive) to positive (negative). This finding can be interpreted as the role of IFRS moderating the behavior of the Banking industry around the concession of credit of bad or good quality, assuming requirements dealing with the recognition of more, or less, losses on LLP. In fact, when IDV is high (more risky) the amounts of LLP are also high due to the presence of IFRS requiring the recognition of impairment and losses. Consistently, if UAI is low - meaning Banks are risky- the IFRS increases the association with LLP forcing the recognition of losses on loans near default.

The application of Equation (2) to 2<sup>nd</sup> and 3<sup>rd</sup> Quadrant of the 2x2 matrix is also of interest for researchers. In these Quadrants the coefficient for IDV is not statistical significant, but the interaction with IFRS is positive, meaning, as previously, that IFRS forces the recognition of LLP when IDV is high (which, consistent with theory, would mean a lower amount of LLP). Concerning UAI, either high or low in these two Quadrants, the positive effect

with LLP is mitigated with the use of IFRS, which can be claimed as a tentative of international accounting standards to require an adequate amount of LLP avoiding hidden reserves or losses when companies are higher adverse to risk..

## Conclusion

In this paper I examined the influence of national culture on credit risk behavior assumed by banks using loan loss provisions as a proxy. I find that national culture plays a role, as discussed in prior literature (e.g, Chen et al, 2015; Kanagaretnam, 2014). However, this role is different if we analyze banks that are positioned in four different positions, namely, low individualism and high uncertainty/avoidance index (1<sup>st</sup> quadrant) , high individualism and high uncertainty/avoidance index (2<sup>nd</sup> quadrant), low individualism and low uncertainty/avoidance index (3<sup>rd</sup> quadrant), and high individualism and low uncertainty/avoidance index (4<sup>th</sup> quadrant). Findings show that when characteristics and behavior attributable to national culture is conflicting (namely, low (high) scores of IDV (UAI) and simultaneously low (high) scores of UAI (IDV)), the influence of culture on loan loss provisions is rejected, controlling for banking specific characteristics as well as macro and country specific attributes. Further, additional analyses were performed in order to test whether the influence of the use of IFRSs (versus local GAAP) has a role on the moderation of the influence of national culture on loan loss provisions. The role of IFRS is better captured when countries are split between different Quadrants according to consistent or conflicting scores for individualism and uncertainty avoidance. Results found that the interactions of these variables with the application of IFRS can change the sign of their association with LLP in all the Quadrants, moderating the behavior of the Banking industry around the concession of credit of bad or good quality, assuming requirements dealing with the recognition of adequate amounts of LLP, to avoid hidden reserves or overvalued loans.

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