



# **Shadow Banking a cultural phenomenon? Cultural dimensions as by Hofstede and others**

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## Abstract

A country's share of the shadow banking sector relative to GDP is in the view of the FSB due to "financial intermediation and deepening"<sup>1</sup> (FSB 2015.p15). But what causes these large differences among nations in terms of their financial systems? Cross-cultural differences can be explained using proxies for national preference such as the cultural differences of Hofstede. Culture plays a role in economic decision making and these values are formed by the teaching and practice of parents. The thesis will attempt to relate these differing degrees in shadow banking activity amongst countries by moderating it with Hofstede's six dimensions of culture. The results show that there is a strong negative correlation between individualistic countries, a moderate positive correlation with power distant countries and moderate negative correlation between indulgent countries and shadow banking. The larger implications of the findings are that the banking landscape is changing and moving away from traditional banking fueled by changes in technology into non-banking entities.

Keywords: Shadow banking, cross cultural differences, national preference, financial deepening and cultural dimensions.

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<sup>1</sup> Financial deepening may be considered as (i) the increase in the size of the financial system and in its role and pervasiveness in the economy and (ii) the broadening of the set of intermediaries beyond a core banking sector to encompass a range of actors among nonbank financial intermediaries (FSB 2015.p15).



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## Acronyms

ABCP Asset backed Commercial Paper

ABS Asset backed security

BOI Bank of Ireland

CP Commercial Paper

ECB European Central Bank

ESS European Social Survey

EU European Union

EME Emerging Markets

FSB Financial Stability Board

GDP Gross Domestic Product

G20 The G20 is an international forum for the governments and central bank governors from 20 major economies.

GDPG Gross Domestic Product Growth

GLOBE Global Leadership and Organizational Behavior Effectiveness Research Program

OFI Other financial institution

IVR Indulgence versus Restraint

IMF International Monetary Fund

LTO Long Term Orientation

MAS Masculinity

MBS Mortgaged Backed Security

MNE Multinational Enterprise

NAV Net Asset Value

NBFC Non-banking Finance companies

NRS Normalized Residual Square

OLS Ordinary Least Squares

REIT Real Investment Trust

PDI Power Distance Index

SB Shadow banks

SBA Shadow banking assets

SIV Structured Investment Vehicles

SME Small and Medium sized enterprises SME

SPI Minority Shareholders Protection Index

UAI Uncertainty Avoidance Index

UN United Nations

USA United States of America

VIF Variation Inflation Factor

WVS World Values Survey



## Introduction

The growth of shadow banking has been at the heart of international discussions regarding the stability of financial systems. Alternative financing is blamed for taking the global financial system to new heights in the form of a “shadow banking system” (McCulley, 2009). This operated legally but completely out of the regulated banking system, which has strict regulatory requirements and has the promise of governmental backing in the form of a safety net for deposits. Without this back-up, trust is compromised and corruption threatens. According to McCulley (2009), the shadow banking system was responsible for one of the largest lending booms in decades, followed by collapse, causing one of the most damaging crises ever, namely the financial crisis of 2008. This led to a deeper systematic crisis. New Basle III legislation was introduced with the goal of avoiding another 2007-2009 crisis. The legislation introduced a new phase of regulation, counter-cyclical and anti-asset inflation but was not specifically aimed at the shadow banks by definition and therefore they have already successfully circumvented this new regulation. Furthermore this puts more pressure on banking entities and gives further incentive for financial activity to shift from regulated banking entities. (ECB, 2012).

Shadow banking terminology was first introduced by McCulley in August 2007 at the Fed’s Annual Symposium in Jackson Hole, USA and is now officially termed by the Financial Stability Board (FSB) as “the financial activity of non-banking entities”. In terms of activities shadow banking is generally narrowed to three main areas which are credit intermediation and liquidity and maturity transformation that occur outside regulated financial systems (ECB 2012). This sector has grown explosively over the last few years. The FSB estimates that the growth of shadow banking has multiplied many times. Shadow banking has been credited as being a source of systematic risk and, through inter-connectivity with the traditional banking system, has been seen as a core reason for failure in the most recent banking crisis of 2008 (FSB 2011).

Growth of the shadow banking sector is attributed to over regulation of the traditional banking sector, a prolonged low interest environment, globalization and financial innovation such as the use of asset and mortgage backed securities and others form of securitization. “By broadening the array of products available shadow banks created a new stream of outside funding” (Ferrante 2015).



The development of shadow banking activity across countries does not comply with simple economic or legal explanations and therefore other factors among which culture might be important. Furthermore, country differences with respect to preferences, financial and economic institutions and organizations are initiated by cultural differences (de Jong and Semenov, 2002). The culmination of these preferences determine the configuration of a financial system. Country differences in the size of shadow banking will be evidenced in the two different types of shadow banking creation, firstly shadow banking arising from a vacuum occurring in emerging markets and secondly shadow banking organic initiation witnessed in advanced economies. Incentives of different financial systems depend on the extent of regulation of each system which again will be determined by the choices of political agents.

Therefore this thesis focuses on the interaction between culture, economic institutions, economic organization and performance and relates the extent of shadow banking to other aspects of the economy focusing on culture in an attempt to explain why one country has larger growth in shadow banking than another.

The cultural aspect argues that differences among nations can be explained by differences in national cultures. There are two definitions of culture most appropriate for the purposes of this paper “shared cognition, values, norms, and expressive symbols” (DiMaggio, 1994, p. 25). Culture as defined by Hofstede “collective programming of mind... distinguishes the members of one human group from another” (Hofstede, 1980, p. 21).

Culture shapes economic behavior (Jesof & Scherrer 2014,p13-15) and therefore any statistical analysis between cultural and economic variables should be derived theoretically first. Semenov & Jong identify three approaches for explaining country differences in financial systems: “the legal approach, the political approach and the cultural view” (Jesof & Scherrer 2014,p16). Their paper goes on to say that when comparing banking size the possibility of larger market based banking systems compared to bank based financial systems is highly indicative. This thesis attempts to show this significance when examining shadow banking activity differences. However caution should be given to outliers in countries such as China. Therefore culture is considered as one of the explanatory variables due to the large inexplicable differences between countries. Thus this study looks at Hofstede’s dimensions of culture as a way of explaining the behavior of individual countries in this jump in the growth levels of shadow banking.





This brings us to the main research question: why does the growth of shadow banking differ between different countries? Therefore the focus of this paper is to examine the differing growth rates of shadow banking amongst countries employing dimensions of culture as an explanatory variable.

## **1.2 Research objectives**

This thesis has 5 main steps in determining the main analysis:

- To define and explain shadow banking as a concept and the participants.
- To introduce cultural dimensions as defined by Hofstede and apply them as explanatory variables in differences in shadow banking activity between nations.
- To derive hypotheses based on theory and then test them empirically.
- The stability of these variables will then be critically assessed and methods compared to similar approaches.
- Finally a discussion on the findings of this thesis with respect to the consequences of differing growth of shadow banking activity amongst nations with concluding observations.

## **1.3 Scientific Relevance**

Many studies have looked at the causes and functioning of the shadow banking sector. Non-banking entities have been around for a long time within countries such as China and India, however the recent surge in worldwide growth of shadow banking is thought to be more to do with over-regulation and demand for alternatives. Therefore the focus of this paper is to clarify the results found in the FSB Shadow banking Report 2015 examine the differing growth rates of shadow banking amongst countries and see if this relates to the dimensions of culture of a country.



## **1.4 Practical relevance**

The practical relevance can be found primarily in the insights this gives into shadow banking and how institutions can measure and control activity in this field. Successive central banks and large institutions have concentrated firstly on mapping activities (FSB 2011) and dividing shadow banking into 3 main activities. Secondly the results of the FSB 2015 report showed very different results for emerging and advanced economies. Therefore the dimensions of culture from Hofstede are examined theoretically and then empirically to understand why these countries react so differently.

## **4. Outline of the thesis**

To conduct this research data was used showing the growth of shadow banking for 25 countries with for the period between 2002 and 2011, with data of shadow banking levels from the Global Shadow Banking Monitoring Report 2015 issued by FSB. This report summarizes the findings of the fifth annual monitoring exercise using data at the end of 2014 for 26 jurisdictions with the inclusion of Ireland for the very first time. This report uses improvements to methodology involved in monitoring global financial markets. The report introduces the new concept of “economic function” which is an activity based measure of shadow banking after the high-level policy framework of the FSB 2013 Report (FSB 2015p2). Thus the narrow measure of the FSB 2015 report might by their own admission over-estimate the extent to which non-bank credit intermediation may give result in systemic risk.

This was then put alongside the findings of World Value Survey wave 6 relating to culture dimensions namely power distance, Individualism versus Collectivism, Masculinity and most importantly uncertainty avoidance and indulgence versus restraint for statistical significance. Here a paragraph on the setup of the study, the order of the chapters. The thesis continues as follows. Chapter two describes the shadow banking system including definition, activity and main players. Chapter three outlines new legislation from Basle III aimed at reducing systemic risk in the respective financial systems and it's effects on shadow banking. Chapter four introduces cultural dimensions and it's relevance to shadow banking. Chapters five and six feature the empirical analysis and derive and later test the hypotheses, with results ranking in order of significance. Finally chapters seven looks at the response of institutions to



future regulation. Finally chapter eight focuses on key findings, future research and final conclusion and recommendations.

## **2. Theoretical Foundation**

### **2.1 Literary Review of Shadow banking**

This thesis attempts to quantify shadow banking through concepts of definition and growth estimates. Sheridan Prasso introduces shadow banking to the general public and supplies figures on recent estimates of growth without qualification (Prasso, Mar 31, 2015). The concept of the magnitude of shadow banking is simplified by the International Monetary Fund (IMF)(E.Kodres, June 2013). Here she defines the activity of non-banking entities into maturity, liquidity and risk transformation. The latter should include broker-dealers that found their assets moving repos. According to the Financial Stability Board the concept of size is captured by macro-mapping activity (FSB, 14 November 2013). This report also brings in the concept of cross-border jurisdictions where previously the FSB had neglected this dimension.

The creative idea of the size of shadow banking by devising an index and relating this to Pareto's theory was introduced by the authors Fiaschi et al. (Davide Fiaschi, April 11, 2014). The impact of shadow banking on the effectiveness of Basle III is addressed by Lee(2015) which compliments theories on loan quality (Ferrante, 2015). Finally concepts of the future of shadow banking is examined in terms of size of the market. (Nesvetailova, 2015). The concept of systematic risk mapping.

### **2.2 Definition and components**

The shadow banking system is broadly defined by the Financial Stability Board (FSB) as “a system of credit intermediation that involves entities and activities [operating] outside the regular banking system” (FSB 2015, p1). According to the Economist this can include mobile payment systems, pawnshops, peer-to-peer lending websites, hedge funds and bond trading platforms. The FSB definition though the most widely accepted definition does not provide the insight into the components of shadow banking and activities. Interestingly the FSB 2014 shadow banking report states “some authorities and market participants prefer to use other terms such as market-based financing instead of shadow banking” which implies a market-based



system as opposed to a bank based system (FSB 2015, p1).

According to the FSB shadow banking parties consist of money market funds, finance companies, structured finance vehicles, hedge funds investment funds besides the ones already mentioned, broker-dealer and real estate investment trusts (REITs). Shadow banks are financial intermediaries that conduct maturity, credit, and liquidity transformation without access to central bank liquidity or public sector credit guarantees.

Maturity transformation is when traditional banks use deposits, normally classified as short-term to fund loans that are long-term in nature. Shadow banks borrow short-term funds in the money market and then buy longer-term maturity assets but unlike classical banking they are unable to borrow from a central bank and do not have traditional depositors whose funds are covered by insurance. This led the banks to engage in the so-called securitization chain with the original mortgage being bought, repackaged with other mortgage loans of varying credibility and then resold as an asset-backed security to investors.

The value of this security was linked to the value of loan book in the package. The interest accrued on the mortgage backed security was paid from the interest and principal paid by the homeowners on their mortgage loans. The process from the creation of a mortgage to the sale of the asset-backed security falls under the umbrella of shadow banking and is thus unregulated.

The Financial Stability Board (FSB) then defined shadow banking as being all parties operating outside the regulated banking system that conduct core banking activities namely credit intermediation. Credit intermediation then can be split into four main categories: maturity and liquidity transformations, leverage and credit risk transfers. Maturity transformation are where short-term funds are converted to longer-term assets such as mortgage-backed securities MBS or asset-backed securities ABS. Liquidity transformation where cash-like liabilities are used to buy harder to sell assets such as loans. Leverage in this context is where borrowing money is taken as collateral against buying potentially much larger fixed assets. Credit risk transfer is taking the risk of the borrower's default and transferring it from the loan originator to another entity. This would include brokerage funding activities through repos. Repurchase agreements are where a party needing funds sells a security with promise of repurchase at a specified day and date.



Money market funds that pool investors funds to buy corporate paper (CP) or mortgage-backed MBS securities are also seen as shadow banks. Likewise sellers of CPs in order to extend credit to households the so-called finance companies.

### **2.3 Activity and main players**

Examples of shadow banks include finance companies, asset-backed commercial paper (ABCP) conduits, limited-purpose finance companies, structured investment vehicles, credit hedge funds, money market mutual funds, securities lenders, and government-sponsored enterprises.

### **2.4 Traditional banking versus shadow banking**

Shadow banking provides necessary functions that cannot be fulfilled in the traditional banking sector. Firstly it performs regulatory arbitrage – this role was particularly essential up to the role up of the financial crisis. Additionally financial intermediation is not covered by traditional banking. This led to a great increase in shadow banking and is probably the biggest reason regarding the huge growth in the form of securitization.

Despite the differences in classification and inclusion of shadow banks, regulators preoccupied with one issue which is although shadow banks act like traditional banks in their credit intermediation functions, it is not subject to the rigorous regulations that are applied to traditional banks. Dr Emily Lee believes that shadow banking regulatory policy “should be strengthened due to the systematic risk it poses in causing a financial crisis” Lee, D. E. (p3, 2015) which would threaten the traditional banking sector. Finally the FSB was asked by the leaders of G20 to put together guidelines in order to enhance the monitoring and regulation of the shadow bank system with other world institutions such as the IMF and World Bank (Lee, D. E. p3, 2015).

### **2.5 The growth of shadow banking differs between countries**

Due to disparity regarding the definition of shadow banking amongst financial authorities measures of scale are extremely difficult to gauge. Some countries are still absent from the list of jurisdictions such as Luxembourg and many entities do not report to government



regulators. Under the broad definition of shadow banking utilised by both the IMF and the FSB, China's shadow banking sector is small in comparison to its economy at 31% in 2013. In contrast the UK, US and certain countries in the Eurozone such as the Netherlands have extremely high levels of assets compared to GDP with levels of 648%, 150% and 760% respectively (see table below). Ireland has since been added to the 2015 report at a huge 1,190% of GDP. These figures indicate that shadow banking growth still exceeds GDP growth. However these figures contrast strongly with countries such as Turkey, Argentina, Saudi Arabia, Russia and Indonesia with shadow banking assets below 10% of GDP.

Critics of the broad definition say that by focusing on non-bank entities, the FSB neglects shadow banking occurring by bank's themselves. The Financial Stability Board (FSB) estimates in its global shadow banking 2015 Report that the shadow banking to GDP ratio has grown to from 55% in 2012 to 59% in 2014.

The report then goes on to state that the size of each countries share of the total shadow banking sector has changed since 2010. On the one hand countries such as Japan, France, UK and the USA have witnessed a decline in their respective shares in shadow banking assets since 2010. This contrasts sharply with the shares of emerging markets which grew from 6% in 2010 to 12% in 2014 led by China.

The narrow definition is also employed by the FSB 2015 on shadow banking and means that pension funds and insurance companies not involved in the facilitation of credit are not classified as shadow banks, Other Financial Institution (OFI's) not involved in credit intermediation and also finance entities that are a subsidiary of a banking group whereby capital buffers are in place are also counted. The aim of the "economic based" narrow definition is to identify shadow banking risks in non-banking entities (FSB 2015, p10).

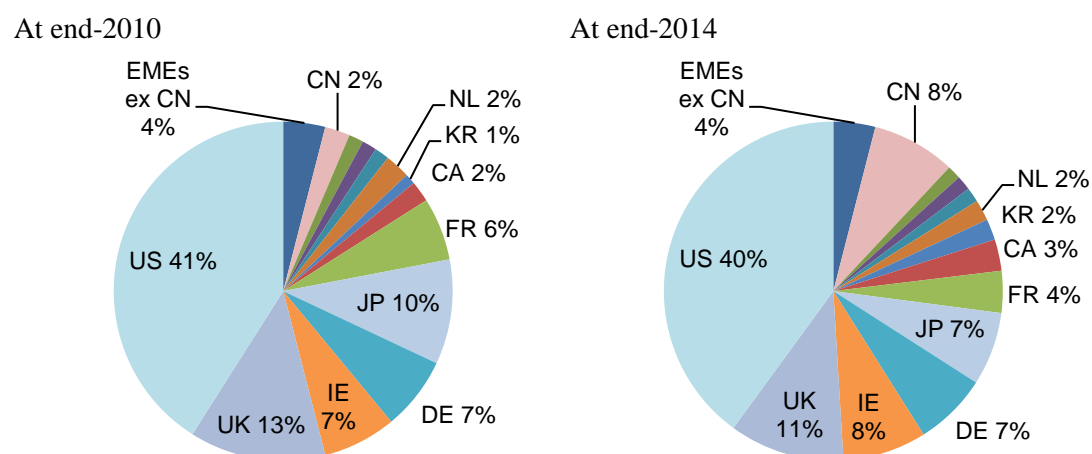
The share of shadow banking in total bank intermediation is thought to be 33% in 2013. According to the Global shadow banking monitoring report of 2013 conducted by the FSB the advanced economies command the greatest share of the non-financial banking activity which grew by \$5 trillion in 2012 to \$71 in 2013. The largest player being the United States followed by Europe and the UK. The growth rates themselves showed considerable differences ranging from -11% in Spain to + 42% in China. Emerging markets displayed the most rapid growth from a small base from 2012 at over 20%.

**Table 1 Shadow banking size comparison**

Shadow Banking Assets as % of 2013 GDP	
Netherlands	760%
United Kingdom	648%
Switzerland	261%
United States	150%
China	31%

Source: FSB, Global Shadow Banking Report 2014

**Figure 1 Shadow banking: geographic repartition**



Note: CA = Canada; CN = China; DE = Germany; EMEs ex CN = Argentina, Brazil, Chile, India, Indonesia, Mexico, Russia, Turkey, Saudi Arabia, South Africa; FR = France; IE = Ireland; JP = Japan; KR = Korea; NL= Netherlands; UK = United Kingdom; US = United States.

Source: National financial accounts data; other national sources; FSB calculations.



**Table 2 Assets of financial intermediaries**

Assets of financial intermediaries

	Size in 2014 (\$ trillion)	Growth in 2014 (year-over-year, percent)	Average annual growth (2011-2014, percent)
<b>Banks</b>	<b>135</b>	<b>6.4</b>	<b>5.6</b>
<b>OFIGs</b>	<b>68</b>	<b>9.0</b>	<b>6.3</b>
<b>Shadow Banking</b>	<b>36</b>	<b>10.1</b>	<b>6.3</b>

Note: Growth rates adjusted for exchange rate effects.

Sources: National financial accounts; other national sources; FSB calculations.

## 2.5 Bank concentration

The statistics in the FSB 2015 shadow banking monitoring report indicate that bank concentration levels play a role in the size of non-banking activity. The advanced economies with mature financial sectors have non-banking sectors that are not only large proportionally to GDP but also in some cases such as Ireland and the Netherlands roughly the same size as the shadow banking sector is much larger than the traditional banking sector.

In emerging markets the opposite is true that non-banking entities are in size smaller with respect to GDP, with these countries the traditional banking sector is still more dominant. Therefore, further empirical research in this field would be interesting.

## 2.6 Emerging market vacuum, advanced economy organic growth

The nature of the growth in shadow banking varies from country to country in under-developed financial systems it fills a vacuum for financial activity unobtainable from the regular market In advanced financial economies its growth is organic where regular banks can use entities within their organization to partake in shadow bank activities.





## **2.7 The emergence and reason for rapid growth**

The main reasons of why the shadow banking sector has grown so rapidly in advanced economies include the result of strict traditional banking regulation, an extended low interest rate environment and high institutional demand for higher yielding assets from insurance companies and pension funds. This contrasts with the lack of accessible funds in emerging markets.

## **2.8 The importance and problem posed by shadow banking**

The importance of shadow banking is the scale of activity having reached \$75 trillion worldwide and representing almost half of the total financial activity for the country in the example of China and India. The largest problem posed by shadow banking is that of the inherent systematic risk to global financial markets. Because the activities of shadow banking flourish unregulated, control measures of regulators and monetary policy can in the extreme become totally ineffective.

## **2.9 Regulation of the Shadow Banking Sector**

Shadow banking often evolves from the incentives posed by regulatory arbitrage. Therefore, tax havens with liberal regulation in comparison to those of mature financial markets attract investments from overseas. This includes “hot money” generated through structured finance vehicles which are usually constructed primarily for tax avoidance alternatively or additionally for off-sheet tax purposes. Shadow banking can have cross border implications when these banks operates across geographical borders. Secondly the different legal and regulatory frameworks occurring when engaging in cross-border transactions means monitoring and controlling shadow banking activity is impaired.

In countries such as India, shadow banks as classified elsewhere in the world are in fact finance companies but are Non-banking Finance companies (NBFCs) and due to this definition in India they have been under the regulatory structure of the Reserve Bank of India since 1963. Therefore the list of shadow banks could be extended to insurance companies, pension funds and public institutions (some publically owned investment seeking institutions). The latter however are unlikely to cause significant systematic risk.



The G20 leaders met at the Seoul Summit in Nov 2010 and the Financial Stability Board was asked to develop recommendations and to strengthen its oversight and regulation of the shadow banking system with the World Bank and IMF. The Financial Stability Board then came with 13 recommendations, which can be summarized as the followingg. Firstly the improvement in regulatory reporting and market transparency Secondly regulation of securities financing the market. Thirdly policy recommendations pertaining to structural aspects.

### **3. Basle III**

#### **3.0 Implications of Basle III**

Strict regulation of the traditional banking sector, a relatively long period of low interest rate environments coupled with a large demand for assets from the insurance and pension funds has caused the industry of shadow banking to flourish.

Basle III requires more stringent capital requirements which could fuel shadow banking growth due to the fact that traditional banks need additional capital in order to fulfill Basle III.

Shadow banks in advanced financial economies did not grow due to a vacuum of instruments but it can be viewed more as organically due to constraints from both capacity such as limits on lending and regulation on levels of deposit rates. As traditional banks sought to maximize profits by increasing their lending ability, this could only be achieved by removing loans from the loan book or customer deposits ie reducing liabilities on the balance sheet.

Therefore a traditional bank would then sell those assets on to structured finance vehicles which are separate legal entities from the parent company or traditional bank that created the offshoot. Paul Tucker, of the IMF cited Structured Investment Vehicles (SIVs), ABCP (Asset backed Commercial Paper) and money funds as being instrumental in the run up to the financial crisis. SIV's are a group of investments that profit on the difference in price spreads from structured financial products such as ABCP's or mortgaged backed securities (MBS's). As a consequence in order to monitor financial risk accurately for the banking system emphasis should be made on regulatory arbitrage performed by the parent bank in order to avoid regulatory constraints and supervisory monitoring and even more importantly the inter connectivity between traditional and shadow banking activities.



### **3.1 A summary of Basle III rulings and subsequent consequences**

The Basle III will have limited impact on curbing shadow banking growth. The long phase of adaptation by banks from Jan 2013 to Jan 2019 means banks will come to rely more on shadow banking activities in order to attain a better financial position and maximize revenue. The monitoring of the shadow banking sector has proved to be more difficult due to supervisory, market and technical challenges. Shadow banking has no access to central bank funding or safety nets therefore is more likely to damage in a crisis. Basle III is therefore incidental to shadow banking as Basle III focuses on traditional banking. Basle III has both a micro-and macro-prudential tools reserved solely for international banks, raising their loss-absorbing capitals versus losses normally associated with an increase in systematic risk. This then narrows the divide created by differing regulation of the banking book versus the trading book in relation to capital buffer fund reserves.

### **3.2 The global crisis and the explosion of shadow banking**

Kodres defines shadow banking as “symbolizing one of the many failings of the financial system leading up to the global crisis” (Kodres, Finance and Development, 2013, p.42 ). She furthers this by stating “systemic risks are associated with the various activities, entities, and instruments that comprise the shadow banking system” Kodres, Finance and Development, 2013, p.43). This highlights the dangerous and corruptive properties associated with shadow banking and this sector is still seen as more of a threat to society contrasting sharply with it’s innovative, transforming and progressive nature, which can be taken to be positive.

According to Siegel the explosion witnessed in shadow banking during the 2008 global crisis was due partly to the public believing that funding instruments outside the regulated banking were “just as good” as deposits at the bank because large scale default has not been observed in the historical track record yet, therefore shadow banking prevails (Siegel 2009, p2-17) .



### **3.3 Countries with special situations:**

#### **3.3.1 Shadow Banking in China**

Shadow banking differs in China in respect to other countries due to the large urbanization programme that has occurred in its major cities. According to a paper by Lai (Lai & van Order 2016, p4-5.) in 2016, the Chinese government eased conditions on second house purchases. However, because the economy slowed down in 2015 the government found themselves lifting more restrictions in an attempt to revive the economy. Chinese homeowners bought more and more property and in order to fund these projects, builders and construction companies required more credit in the form of loans. This fueled Chinese shadow banking activity levels with growth levels far beyond those seen in other countries.

This is a clear example of shadow banking occurring due to a vacuum as the 5 largest banks in China are government owned. They are not permitted to lend to Small and Medium sized enterprises (SME's) other than the larger government owned enterprises. This opened up a huge gap only to be filled by shadow banking funding.

Although heavy investment in infrastructure may have boosted GDP in some areas of China it also created ghettos of roads and bridges which are under-utilized. It is estimated that 20-40% of on-balance sheet bank lending is done by shadow banks whereby in their absence total lending would decline by 16-29%.. In Table 1 of the FSB 2015 report China is only ranked 13<sup>th</sup> out of 26 countries and shadow banking activity accounted for only 26% compared to 82% in the USA. But according to Lai funding in the US comes from a variety of different sources whereas in China this is mainly from Other Financial Intermediaries (OFI's) or financial institutions other than central banks, banks, pension funds and insurance companies. Therefore by referring only to the economic function-based definition of shadow banking, this figure in the case of China could be much higher and Lai suggests an "under-estimated proportion of loans in the total loan system" (Lai & van Order 2016, p4-5).

The speed of growth in the shadow banking sector in China is thought to be the most worrying factor rising from 1.6% to 7.7% of all assets in financial intermediation which is the third largest sector in terms of size.. According to Sheng, the property market is the 3<sup>rd</sup> largest industry in China and makes up 18% of shadow banking assets Sheng also claims that 22% of



the total banking sector will be bad-loans or non-performing by the end of 2016. Thus although the shadow banking industry is not so large when compared globally, China has a large traditional banking sector that has outgrown an economy that is in a transition stage regarding urbanization and privatization. Therefore contagion and systemic risk in the financial markets in China cannot be ruled out.

### **3.3.2 Shadow banking in Ireland**

Ireland's figures on shadow banking stand out amongst the other 24 jurisdictions in the 2015 FSB report and were in fact included for the first time. This section attempts to describe Ireland's shadow banking growth with respect to the other countries and introduces the concept of interconnectedness.

Ireland's shadow banking is thought to be ten times greater than the Irish economy. It is on par with China as being the largest center for nonbank entities after the USA and the UK, with €2.3bn of assets. Part of the problem is that a Dublin-based SPV is often linked to other European banks which are well supervised everywhere else in the world but not in Ireland up until 2015.

The Irish authorities are now collecting info on Special Purpose Vehicle's (SPV's) and the FSB 2015 Shadow banking report featured in this thesis does contain Ireland but still does not include countries such as Luxembourg with a large shadow banking contingent.

"There's concern that Irish SPVs are exporting risk to other financial systems around the world and could have contagion effects," said Shaen Corbet, a lecturer in finance at Dublin City University (Griffen,& Brennan, Bloomberg, 2016, p2) .

The Irish authorities were not obliged until late 2015 to receive data from Irish SPVs and had no obligation to alert the central bank unless they were operating in regulated markets. Under Irish legislation, entities are structured so that transactions deliver as little profit as possible so as to avoid tax. In order to prevent assets and liabilities being registered on the balance sheet, shares were held by charitable trusts.



Bank interconnectedness is defined through direct counterparty exposures such as assets, funding and payment networks but also on the sector exposure such as the property market, Gai and Kapadia found that financial systems tend to be “fragile yet robust” (Gai and Kapadia, PRSL 2010 p1). Although interconnectedness can bring advantages in terms of risk sharing, reduced transactional costs and small shocks can be well absorbed. However larger shocks will have a magnified effect, hitting other markets and institutions around the world. Therefore the level of interconnectedness is critical as the failure of important institutions or banks can spread contagion around the world. Therefore many central banks have undertaken studies to assess the level of interconnectedness and consequences.

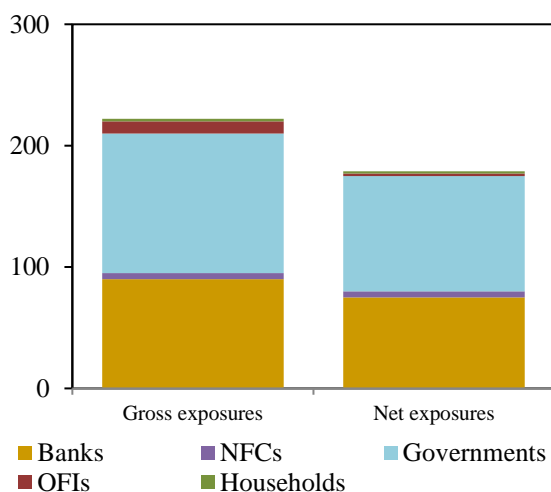
The Bank of International Settlements (BIS) published the only publically report on interconnectedness by aggregating the level of national banking and at the same time tracking the positions of foreign banks and financial links amongst nations.

In June 2015 the Irish banks reported gross bilateral exposures of €223 bn of large exposures see chart 1. Large exposures mean exposures in excess of 10% of that banks capital, this compares with €480 of total exposure to the same banks. Large exposure is preferred due to the fact that the additional exposure is small in comparison. More than 50% of this large exposure are to foreign central banks. While the remaining 40% are to credit institutions and exposure to OFI's is only 5%. In terms of instruments, 85% of interbank are debt instruments, see chart below:



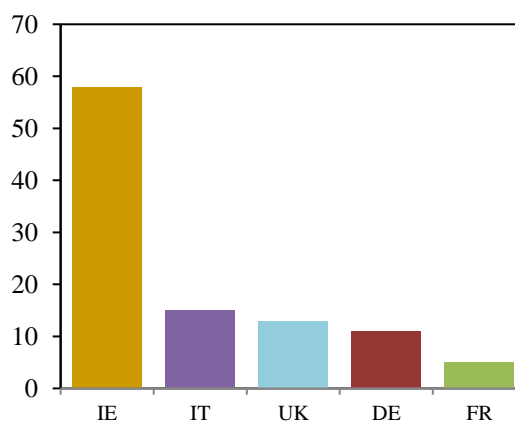
**Figure 2 - Interconnectedness of the Irish banking sector with the global financial system**

**Chart 1: Gross and net reported bilateral large exposures by sector**



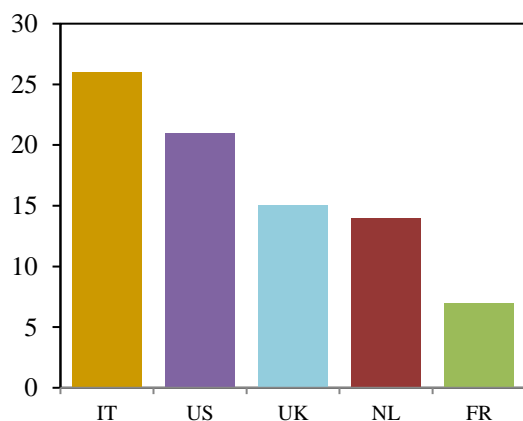
Source: Central Bank data as at June 2015.  
Note: Large exposures refer to exposures greater than 10 percent of a bank's capital

**Chart 2: Gross sovereign large exposures by country of counterparty - top 5**



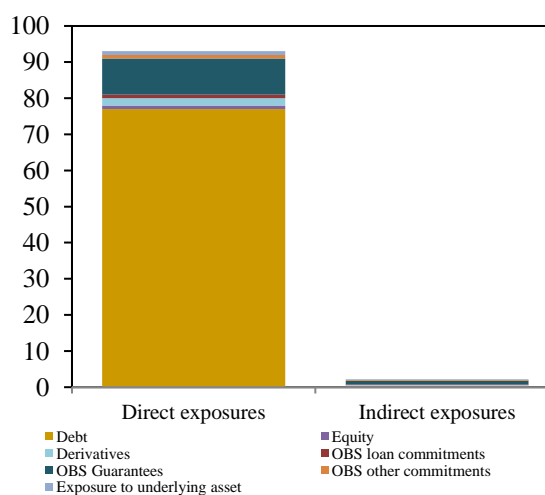
Source: Central Bank data as at June 2015.  
Note: Large exposures refer to exposures greater than 10 percent of a bank's capital

**Chart 3: Gross interbank large exposures by country of counterparty - top 5**



Source: Central Bank data as at June 2015.  
Note: Large exposures refer to exposures greater than 10 percent of a bank's capital

**Chart 4: Breakdown by instrument for gross interbank large exposures**





Therefore in the example of Ireland, the importance of bank interconnectedness is reflected and that it has become the priority of many central banks to measure and monitor this new concept Coates et al. (2016 Jan) Central bank of Ireland. Unfortunately Interconnectedness is not included in the empirical part of this thesis as the statistics available were not sufficient.

### **3.4 Technology**

As the traditional banks find themselves under greater pressure due to their margins being squeezed, non-banking activities for both credit and financing are expanding. Innovation supports the shift from banking to non-banking entities. “Technology is driving dramatic changes in consumers’ behaviors and expectations—and that affects all traditional transactions,” (Corporate Finance, April 2016). Estimates by this publication are that digital players can erode as much as a third of traditional retail banks profits by the year 2020 and that 70% if customers only consider their relationship with the retail bank as being transactional. New digital platforms are being launched by banks but importantly non-bank entities offering alternative methods of payments such as Apple and peer-to-peer lending and crowd financing.

## **4 . Cultural Dimensions**

In this section we begin by defining culture and then the dimensions of culture and examine their appropriateness for country differences in shadow banking growth.

### **4.1 Introduction to culture via organizational theory**

The question of how human societies and economies self-organize is still largely unanswered. Other questions arise such as why do economies take on a specific structure.

Despite there being no official definition of the institution it is generally accepted that North and Scott offer the most credible insight into the concept. They both transformed first impressions surrounding institutions into a definite concept and furthermore analytic tool. North defines the institution as being as “humanly devised constraints that structure political, economic and social interaction” (North, 1994, p. 361). Furthermore he differentiates between formal constraints such as rules and regulations and informal constraints such as values and norms. According to North the “rules of the game” then mold the behavior of the economic





agents, instigate structure and order and reduce anxiety concerning any unknowns (North, 1991, p. 98).

These constraints define the incentives that determine the choices that actors make that shape the performance of societies and economies over time (North, 1994). Scott (2001, p. 48) defined institutions as “social structures that have attained a high degree of resilience”. “It is the interaction between institutions and organizations that shapes the institutional evolution of an economy. If institutions are the rules of the game, organizations are the players” (North, 1994, p. 361).

As a consequence of which it would make sense that we examine the dimensions of culture as denoted by Hofstede when assessing why the differences in growth of shadow banking among nations. Although much research has been done on the credit crisis, Basle III implications and shadow banking, solutions to the causality should focus on norms and culture as this could explain the banks urge for re-definition. Basle III and other factors have caused the banks to de-institutionalize and the resulting industry of shadow banking has been conceived not as a vacuum but as a hybrid.

## **4.2 Culture defined**

Hofstede defined culture to be “the collective programming of the mind that distinguishes the members of one group or category of people from another” (Hofstede, G. 2005).

What many group members have in common and sets them apart from another group is called culture. The properties that they have in common are passed down from generation to generation via parents to children, not necessarily by what is spoken but behavior in critical situations for example. The research of Geert Hofstede has proved that among nations, cultural differences are established at the most profound level namely values. This does not mean that the national culture is static but at the value level change only occurs gradually.

Hofstede performed a study on IBM employees in 66 countries and in 7 different job descriptions. Hofstede went on to define six dimensions of culture. The national dimensions are summarized as the following:



Uncertainty avoidance, UAI This describes employees approach to ambiguity, conformity to rules, long-term employment and promotion.

Masculinity / femininity MAS, This in the dominant values within an organization exhibiting masculinity ie assertiveness and monetary focus.

Power Distance PDI This measures a society's tolerance to accept power from organizations and institutions. Countries with a low PDI tend to favour decentralized organizations or governmental authority.

Collectivism / individualism (IDV ) This is the extent individuals look after themselves. In collective societies people look after themselves and others in the group, they provide protection in return for loyalty.

Long-term orientation (LTO) This dimension was added later and refers to different time frames used by different people and organizations.

Indulgence vs. restraint (IND) This new dimension was added by Hofstede in 2010 and defined indulgence as “a society that allows relatively free gratification of basic and natural human desires related to enjoying life and having fun.” (Hofstede 2010, p281) Restraint is thus termed as a society that controls gratification of needs and regulates it by means of strict social norms.” Indulgent societies believe themselves to be in control of their own life and emotions; restrained societies believe other factors dictate their life and emotions” (Hofstede 2010, p281).

### **4.3 Hofstede's cultural dimensions applied to shadow banking**

#### **4.3.1 Uncertainty avoidance**

The cultural dimensions by Hofstede are now analyzed for their relevance to shadow banking activity differences among nations .The first dimension to be applied is Uncertainty Avoidance. Countries that exhibit high levels of Uncertainty Avoidance feel uncomfortable with uncertainty, value beliefs and institutions that provide certainty and conformity, are more emotional and usually less tolerant of different opinions. Countries with weak UAI rules are



only implemented when absolutely necessary. High UAI countries have a strong need for rules and laws to the point that some rules may be applied which are inconsistent. Therefore the expectation with high UAI is that the countries concerned will like a highly regulated environment i.e. low shadow banking participation. However tight regulation leads to circumventing regulation and encourages shadow banking. Therefore UAI becomes ambiguous and therefore no hypothesis is formed.

In this thesis, Uncertainty Avoidance might have a negative effect on the shadow banking. However this may appear contradictory. Investor rights protect lenders and creditors against uncertainty coming from systemic shocks. Therefore, it is expected that uncertainty avoiding societies to value investor protection and a highly regulated environment not favoring a shadow bank system. The expected negative relation between uncertainty avoidance and shadow banking might originate from its effect on the ‘choice’ of a financial system. Market-based systems with a higher incidence of shadow banking are seen as displaying “more fluctuations in wealth and consumption, and less intergenerational risk-sharing” (De Jong 2009, p. 73).

Market based systems have a higher incidence of shadow banking. This leads to higher levels of uncertainty, which is not wished for by societies with high levels of uncertainty avoidance. Instead, these societies are most likely to establish a bank-based system. In a bank-based system however, important shareholders and managers play a central role in decision-making. Less strict regulation is in place to protect minority shareholders than in a market-based system. Indeed, this hypothesis seems to be made by De Jong & Semenov (2006, p. 156).

It appears that a more direct relationship between Uncertainty Avoidance and market regulation is assumed by Licht et al. They point out that ‘high Uncertainty Avoidance is consistent with giving power to authorities who control uncertainty. Low Uncertainty Avoidance is compatible with readiness on the part of corporate constituencies to challenge one another – in general meetings, in public media, and in the courts – with indeterminate outcomes’ (Licht et al. 2005, p. 236).



Countries typically displaying high on uncertainty avoidance include Israel, Belgium and Argentina. Low UAI are China, Ireland, India, Hong Kong

Hypothesis H1: There is a statistical significance between countries displaying a low UAI score according to Hofstede's dimensions of culture and those countries experiencing a rapid change in size of shadow banking activity.

#### **4.4 Masculinity**

The effect of Masculinity/Femininity on the degree of financial regulation is not readily apparent. On one hand, feminine societies show empathy towards weak parties. Therefore default or larger gains of the shadow banking industry might be perceived as corrupt. Vice versa, masculine societies emphasize competition and supporting the strong. These elements of the cultural dimension at hand suggest a negative relationship between masculinity and financial regulation. On the other hand, femininity is associated with harmony and striving for consensus, whereas conflicts in masculine societies are often resolved by fighting them out. Masculine societies favor market-based financial systems. As established above, these often provide a higher degree of financial regulation and protection. The latter arguments seem to be decisive in De Jong & Semenov (2009). In their first hypothesis, they expect the strength of legislative protection and regulation of financial markets to be positively related to the level of masculinity.

However because shadow banking involves an amount of ambiguity regarding masculine and femininity at the country level with a lot of countries falling into the middle category, no significance is expected and thus no hypothesis derived.

#### **4.5 Power Distance**

In third place there is a cultural dimension called Power Distance. Acceptance of unequal distribution of powers in institutions characterizes high Power Distance.

Similarly, the effect of Power Distance is ambiguous. Licht et al. predict that the coefficient of Power Distance will be positively related to the activity of non-banking entities. According to them, high Power Distance implicates a negative view of power and wealth. In my opinion,



this statement is based on a misreading of Hofstede's Power Distance. On the contrary, in a high Power Distance society the population feels that a hierarchy, a certain order of inequality, is necessary and legitimate. In these societies the inequality of shadow banking and non/regulation will therefore be more readily accepted. The sign might be negative, but not on the basis of the reasoning by Licht et al. De Jong & Semenov (2006, p. 150, 158) hypothesize that the protection of financial markets will be stronger in low Power Distance countries. This they believe is due to people's perception of economic organization being evaluated by normative considerations De Jong & Semenov (2006, p. 155). The attitude concerning concentration of economic power is vital. The concentration of financial and economic power and thus political power could be unsatisfactory for voters, if this concentration of power raises the barriers to entry and contravenes democratic values. In societies with low power distance against the high concentration of financial power affording those agents excessive political influence, these societies will presumably call for more financial regulation.

Countries displaying high on power distance include Mexico, Venezuela and China. Low power distance are countries like the USA, Sweden and Austria.

Hypothesis H2: There is a statistical significance between countries displaying a high PDI score according to Hofstede's dimensions of culture and those countries experiencing a rapid expansion in shadow banking activity.

#### **4.6 Individualism versus Collectivism**

The level of individualism indicates the degree to which individuals are integrated into groups. An individualistic society values loosely knit social relations in which individuals are only expected to look after themselves and their immediate families. Conversely, in collectivist societies the 'in-group' is much wider and includes, for example, extended family.

The cultural dimension individualism is ambiguous for several reasons. First of all, the level of individualism in the countries in the data set is usually very high, since data on OECD countries are regularly used. Furthermore, De Jong & Semenov (2009) find that the nature and strength of the relationships between shadow banks and monetary authorities can differ substantially in interpretation among collectivist countries. Consequently we refrain from direct causation.



Concluding any direction on a theoretical basis of this cultural dimension in any hypothesis is impossible to predict. In spite of these arguments, Licht et al. speculate that “individualism (versus collectivism) legitimizes the vigorous pursuit of personal interests rather than deference to others’ decisions and interests” and will therefore positively influence the degree of investor protection. Thus we presume for the purposes of this thesis market regulation and shadow banking activity will also be more affected by individualism rather than collectivism. (Licht et al. 2005, p. 236).

Countries displaying high on individualism include the USA, New Zealand, UK and Australia. High collectivism include Pakistan, China, Venezuela, Hong Kong and Singapore.

Hypothesis H3: There is a statistical significance between countries displaying a high IDV score according to Hofstede’s dimensions of culture and those countries experiencing a rapid expansion in shadow banking activity.

#### **4.7 Long term Orientation**

Long-term orientation focuses on time orientation. Delaying short-term rewards to prepare for the future. Long-term orientation values thrift, perseverance, ability to adapt to circumstances. Short-term orientation favors immediate gratification for long-term fulfillment. Applying this to the financial world, according to Brochet (Brochet 2012, Harvard Business Journal) short-term orientated asset managers have more volatile stock returns and higher estimated cost of equity and greater risk. His short-termism captures a dimension of non-diversifiable risk in the economy. The long-term orientation approach implies formal regulated systems, no loopholes, incentive systems, lower volatility, thrift and virtuous and even exemplary behavior. Integrated reporting presents a holistic picture. Directly applying this to shadow banking growth implies a tendency towards short-term orientation. Wanting quick results without concern of the longer-term consequences.

Countries displaying high on LTO include the China, Taiwan, Japan and South Korea. High short-termism include Pakistan, Nigeria, Philippines, Canada and Singapore, UK and the USA.



Hypothesis H4: There is a statistical significance between countries displaying a low LTO score according to Hofstede's dimensions of culture and those countries experiencing rapid growth in shadow banking activity.

#### **4.8 Indulgence versus restraint**

The significance regarding shadow banking lies in the opposite pole namely restraint "a conviction that gratification needs to be curbed and regulated by strict social norms". Indulgence versus restraint as defined by Minkov & Hofstede 2010 where indulgence is defined as "a tendency to allow relatively free gratification of basic and natural human desires related to enjoying to enjoying life and having fun" (Hofstede et al 2010 p281).

This new dimension resembles a distinction in anthropology between loose and tight societies. In loose society, "norms are expressed with a variety of alternatives and deviant behavior that are readily tolerated, a tight society maintains strong values of group organization, permanence, durability and solidarity" (Hofstede et al 2010 p286).

However it should be noted that there is a statistical relationship between indulgence as a measure of well-being and national wealth. With indulgence national wealth explains about 10% of country differences according to Hofstede et al Mindov, logically restraint is more likely in poorer countries.

Countries displaying high IVR include the Venezuela, Mexico, Sweden and New Zealand. Low on IVR include Pakistan, Egypt, China and Russia.

Hypothesis H5: There is a statistical significance between countries displaying a high level of IVR score according to Hofstede's dimensions of culture and those countries experiencing a rapid expansion in shadow banking activity.

#### **4.9 Summary of culture theory**

In conclusion, several studies have found evidence supporting the claim that culture matters in determining the degree of financial market regulation. Using religion and other



proxies have proven to be ineffective.(Hofstede et al 2010). For that reason I would argue that the Hofstede cultural dimensions should be used, while recognizing their limitations as well. As we have seen, however, the effect of a number of cultural dimensions on market regulation is ambiguous. Although their effect on financial market development has been considered, a theoretical framework directly examining the relationship between the cultural dimensions and shadow banking is missing. There might also be a problem of reverse causality. As we have seen, culture is expected to influence the degree of shadow banking through its effect on the choice of a financial system. In this sense, a particular society might favour a market-based system, which in turn is characterized by regulated financial markets. But, could it not be the case that a particular society or country does not value market regulation, encouraging shadow banking unabated? A more extensive theoretical framework might take away these concerns.

Using the anti-director rights index by La Porta et al. (1998), Licht et al. find a significant negative relationship between Uncertainty Avoidance and shareholder rights in the full sample. Excluding the Asian cultural region in the regression, however, yields a different outcome. Anti-director rights are stimulated by higher levels of Individualism, and discouraged by higher levels of Uncertainty Avoidance and Power Distance. The degree of market regulation is significantly affected by Power Distance. The coefficient is of a negative sign.

Similar results have been obtained by De Jong & Semenov (2006, 2009). In accordance with their hypothesis, there is a negative relation between uncertainty Avoidance and the protection of minority shareholders through the regulation of markets. Nonetheless, their results do not indicate a significant relationship between Power Distance and the degree of investor protection. Finally, the coefficient of the cultural dimension Masculinity is insignificant.

As a result of this we expected the growth in shadow banking to be more prevalent in countries with lower Uncertainty avoidance, higher indulgence and higher individualism. On the basis of the above analysis we expect a country's power distance and time orientation have also contributing factors, it is difficult to argue conclusively about their direction of influence and therefore prediction is deemed to be ambiguous.





#### **4.9.1 Hypothesis**

In this section the dominant theoretical arguments are tested empirically. Therefore the following hypotheses are formulated below showing the influence of culture on shadow banking growth.

Hypothesis H1: There is a statistical significance between countries displaying a low UAI score according to Hofstede's dimensions of culture and those countries experiencing a rapid expansion in shadow banking activity.

Hypothesis H2: There is a statistical significance between countries displaying a low PDI score according to Hofstede's dimensions of culture and those countries experiencing a rapid expansion in shadow banking activity.

Hypothesis H3: There is a statistical significance between countries displaying a high IDV score according to Hofstede's dimensions of culture and those countries experiencing a rapid expansion in shadow banking activity.

Hypothesis H4: There is a statistical significance between countries displaying a low LTO score according to Hofstede's dimensions of culture and those countries experiencing a rapid expansion in shadow banking activity.

Hypothesis H5: There is a statistical significance between countries displaying a high level of IVR score according to Hofstede's dimensions of culture and those countries experiencing a rapid expansion in shadow banking activity.

### **5. Methodology**

#### **5.1 Research Strategy**

This thesis uses two approaches. The first one is inductive where the researcher gathers information from official sources such as the IMF, OECD, ECB and the FSB and then decides on one aggregate for the growth of shadow banking over a number of countries.



Then the thesis looks at the relationship between the leap in shadow banking activity amongst countries and Hofstede's dimensions of culture.

Both qualitative and quantitative methods are employed. First of all qualitative methods for research are ascertained via the results of Hofstede's dimensions of culture for the 26 countries named in the FSB 2015 Report for shadow banking. Here wave 6 is employed of the World Value Survey in 2010 therefore incorporating the new sixth dimension of indulgence versus restraint which is highly relevant to shadow banking.

The process of analyzing Hofstede's concepts of cultural dimensions are analyzed and the dimensions were prioritized in terms of relevance to shadow banking growth. These were then compared to the figures of the FSB for the growth of shadow banking for statistical significance. The results are then compared and conclusions drawn.

## **5.2 Data**

Several data bases were examined for shadow banking growth but data was difficult to come by due to the estimate of shadow banking aggregate, few employed data worldwide and were either subjected to country or clubs of countries such as Europe or the USA. Not all of the data on shadow banking is accessible to the general public.

Therefore the FSB data base of growth in shadow banking from 2011 to 2014 although only 4 years, qualifies as a cross-country study of 26 countries and seemed the best available aggregate despite the small time span. This gives the annual growth rate during 2011-2014 adjusted for exchange rate effects (except Singapore where growth rates during 2012-2014 were used). This was compared to GDP growth rates during 2012-2014. Their sources were national accounts data and other national sources, and FSB calculations. The FSB described the measure of shadow banking as "narrowing down towards an activity based measure". This narrowing down comprised of : Removing pension funds and insurance companies not part of the shadow banking sector, OFIs reported not as shadow banking. The FSB did see the necessity for broad measures of shadow banking not only to capture all risk but also to look at systemic risk.

For the dimensions of culture, Hofstede's model is used. He used factor analysis to analyze the results of a worldwide survey data of employee values employed at IBM between



1967 and 73. The first four dimensions were individualism-collectivism; uncertainty avoidance; power distance and masculinity-femininity. The fifth dimension long-term orientation was developed after Hofstede performed independent research in Hong Kong. These results were then integrated and causing Hofstede to use a new measurement of the LTO dimension in the world value survey , increasing the number of countries with reliable scores and the last dimension indulgence versus restraint was added in 2010 in wave 6.

### **5.3 Types of variables**

#### **5.3.1 Dependent variable**

The dependent variable is in this case shadow banking and in the FSB Monitoring report whereby shadow banking growth is based on the economic function-based version, this represents the average annual growth rate in percentage during 2011-2014 and is adjusted for exchange rate effects (Singapore unadjusted rate). The source was the national economies data collected by the FSB.

#### **5.3.2 Moderator variable**

In this case the moderator variables are the six dimensions of cultures of Hofstede, already outlined above.

#### **5.3.3 Control variables**

These are variables that control for other factors influencing shadow banking growth, such as GDP, exposure reflected in the increase or decrease in shadow banking assets, shadow bank concentration levels are encompassed in the number of shadow banks as a percentage of GDP, the level of corruption and the amount of market regulation encompassed in the minority shareholder protection index. Control variables allow for a precise examination of the relation between dependent and independent variables. Control variables refer to variables whose effects on an outcome variable are statistically adjusted in order to estimate independent effects of an explanatory variable. P.D. Mehta (2001) p2727–2730.



Exposure is captured by the percentage increase in shadow banking assets from 2010 to 2014, as portrayed in the FSB shadow Banking monitor report of 2015, by subtracting the 2014 figures from the 2010. We would predict that the percentage increase in shadow banking assets would rise with an increase in shadow banking growth as exposure increases. The absolute level of shadow banking assets estimates for the size of shadow banking assets per country irrespective of GDP levels.

The minority shareholder protection index from the World Bank 2016 Doing Business Report and is a very comprehensive index estimating the “strength of minority shareholder protections against misuse of corporate assets by directors for their personal gain as well as shareholder rights, governance safeguards and corporate transparency requirements that reduce the risk of abuse” (World Bank Group 2016 “Doing Business “). This combines the conflict of interest regulation index with the shareholder governance index. This is seen as a proxy for market regulation and investor protection with respect to the shadow banking analysis and therefore we would expect shadow banking growth to be less with increasing minority shareholder protection.

Although bank interconnectivity would be a definite component of this equation and mentioned in the theoretical part, the statistics provided in the FSB 2015 report were only available for 20 out of the 26 countries and countries such as Luxembourg with substantial cross-border transactions are not included.

**Table 3 Control variables description:**

Variables	Description	Measurement
GDPG	<i>Gross Domestic Product Growth</i>	GDPG as percentage per annum
SB	<i>Concentration of Shadow banks</i>	Number of shadow banks as percentage of GDP per jurisdiction.
SBA	<i>Shadow banking assets</i>	Absolute figure of Shadow banking assets in \$ billion for 2010
SBAC	<i>Exposure</i>	Change in % of shadow banking assets from end 2010 to end 2014
SPI	<i>Minority Shareholder Protection Index</i>	Combination of interest regulation index and shareholder governance index (0-10)

Source: Based on own findings



#### 5.4.5 OLS regression with multiple explanatory variables

For the purpose of this thesis a simple Ordinary Least Square (OLS) model is used with multiple explanatory variables. The Ordinary Least Square (OLS) regression is a generalized linear modeling technique for single or multiple explanatory variables (G.D Hutchinson 2011 p224).

$$\begin{aligned} \text{SHADOW BANKING GROWTH} = & \beta_0 + \beta_1 \text{ GDP} + \beta_2 \text{ CULTURAL DIMENSIONS} + \\ & \beta_3 \text{ GDP} * \text{CULTURAL DIMENSIONS} + \beta_4 \text{ No OF SHADOW BANKS PER GDP} + \beta_5 \text{ SHADOW} \\ & \text{BANKS ASSETS} + \beta_6 \text{ CHANGE IN SHARE OF BANKS ASSETS} + \beta_7 \text{ MINORITY} \\ & \text{SHAREHOLDER PROTECTION INDEX} + \varepsilon_i \end{aligned}$$

### 5.5 Assumptions of a normal regression

The first stage is to test for the normality, linearity, multi-collinearity and homoscedasticity of the regression analysis.

#### 5.5.1. Normality

This is where variables are analyzed to see if they are normally distributed or not. The `kdensity` command to produce a kernel density plot with the normal option requesting that a normal density be overlaid on the plot.

The **`pnorm`** graphs a standardized normal probability (P-P) plot while **`qnorm`** plots the quantiles of a variable against the quantiles of a normal distribution. **`pnorm`** is sensitive to non-normality in the middle range of data and **`qnorm`** is sensitive to non-normality near the tails. As shown in the appendix, the results from **`pnorm`** show no indications of non-normality, while the **`qnorm`** command shows a slight deviation from normal at the upper tail, as can be seen in the **`kdensity`** above. However this seems to be a minor deviation from normality and therefore the residuals of the predictors are close to a normal distribution.



### 5.5.2 Linearity

Scatterplots are used to test for a linear relationship among the dependent and independent variables. The line of best fit is used to derive the linear function, good linearity was observed with most of the plots. The matrix scatter plot in the appendix allows an overview of individual scatterplots for comparison purposes.

### 5.5.3 Homoscedasticity

Homoscedasticity concerns the fact that all residuals of the regressions variables should have the same variance. If this common assumption is not met then heteroscedasticity ensues. Therefore the Breusch-Pagan test was performed after regressing the variables.

Variables: fitted values of SBG

$$\begin{aligned}\text{chi2}(1) &= 0.18 \\ \text{Prob} > \text{chi2} &= 0.6672\end{aligned}$$

The interpretation here being that because of the low chi value, the null hypothesis of Homoscedasticity is accepted showing constant variance.

Limitations of the Breusch-Pagan test is that it assumes that a linear relationship between the independent variable and the error variance and offers no treatment if heteroscedasticity found.

### 5.5.4 Multicollinearity

An important assumption for the multiple regression model is that independent variables are not perfectly multicollinearity. This means that one regressor should not be a linear function of the other. When multicollinearity is detected standard errors can be larger than normal. Therefore the correlation matrix is used alongside VIF values.

After centering the data for interaction the mean VIF gives a value of 2.73 which is well below the critical value of 10 (see table in appendix) however as we know there is a strong



relationship between GDP and shadow banking. Therefore, this study meets the assumption of no perfect multicollinearity.

## **6. Model analysis and testing**

### **6.1 Checking sample and adjustments**

The FSB data base of growth in shadow banking from 2011 to 2014 in 26 countries was the dependent variable. This gives the annual growth rate during 2011-2014 adjusted for exchange rate effects (except Singapore where growth rates during 2012-2014 were used. The GDP growth rates during 2012-2014 were used as a control variable for the time period. Both sets of data are cross-sectional as they occur at virtually a single time point and no time series data is involved.

### **6.2 Sample size**

The sample size of countries in the FSB data base of growth in shadow banking from 2011 to 2014 is low at 26 jurisdictions and therefore makes the results vulnerable to validity checks. Although the WVS is very extensive and has a vast number of variables that could prove to be relevant apart from Hofstede's dimensions, these can only be applied for the 26 jurisdictions mentioned in the shadow banking data which again limits the data set.

### **6.3 Test of Hypothesis**

The testing strategy adopted was to take each hypothesis where each of the six cultural dimensions are regressed against shadow banking growth using a simple OLS regression. The results are then presented in order of significance.



### 6.3.1 Power distance as the cultural dimension

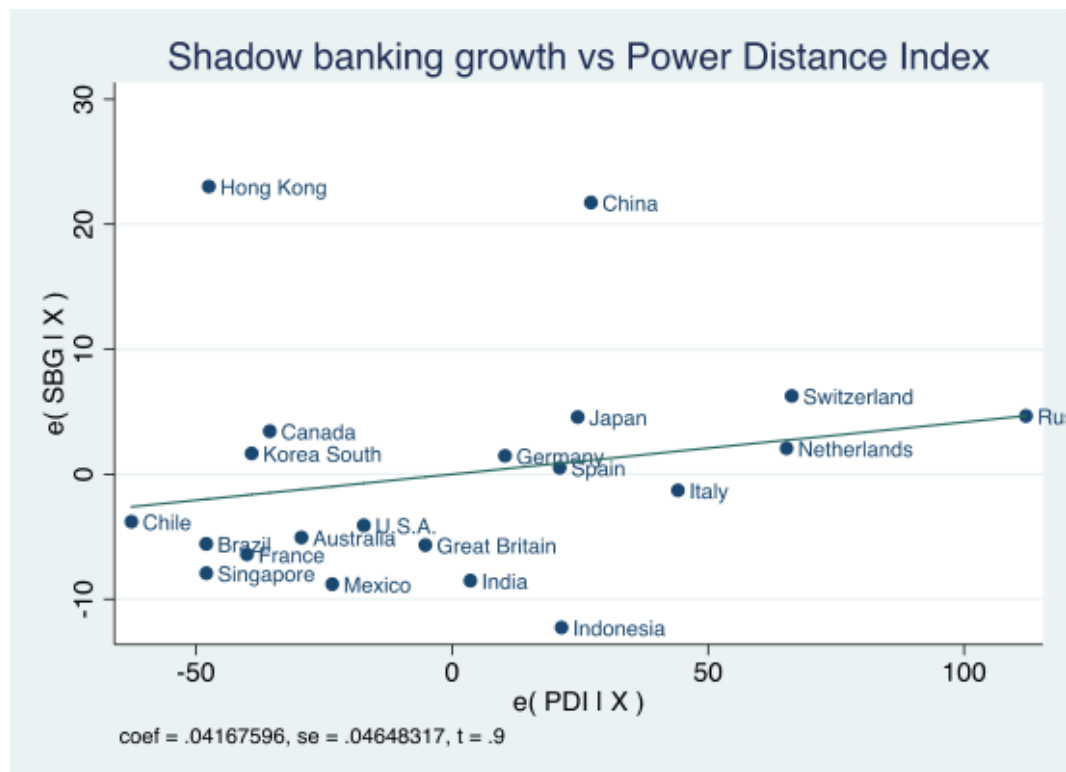
**Table 4 - A simple OLS regression of PDI, GDP and Interaction term cGDPGcpdi**

	(1)	(2)	(3)
VARIABLES	Model 1	Model 2	Model 3
pdi	0.407*** (0.138)	0.0714 (0.160)	0.133 (0.175)
GDPG		2.180*** (0.723)	1.648* (0.939)
cGDPGcpdi			0.0417 (0.0465)
Constant	-12.73 (8.460)	-4.244 (7.622)	-7.121 (8.308)
Observations	21	21	21
R-squared	0.314	0.545	0.565

Standard errors in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1



**Figure 3- Graph of shadow banking growth against the Power Distance Index**

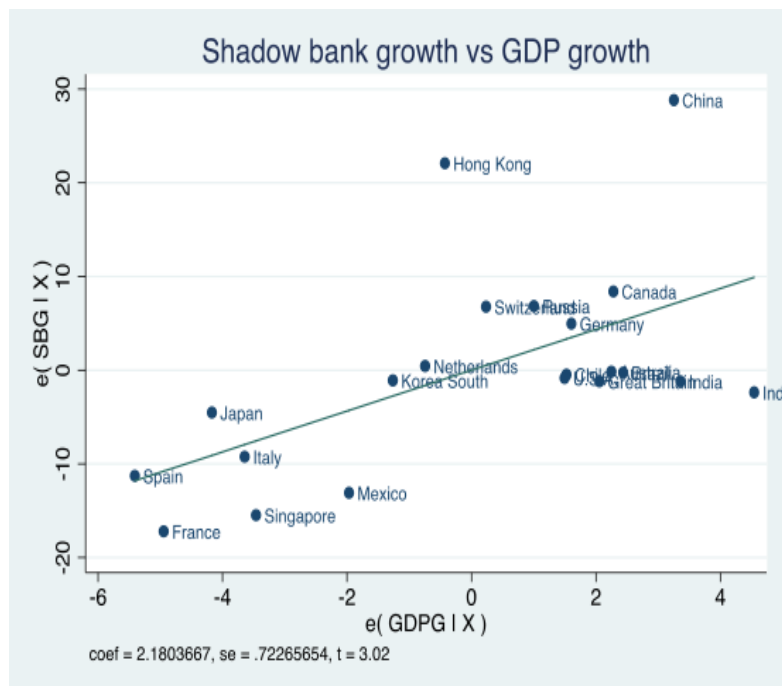


Despite showing significance, countries showing high power distance such as Hong Kong and China were all well away from the line of best fit and candidates for outliers. The analysis proved to be more reliable with countries such as Germany with low power distance.

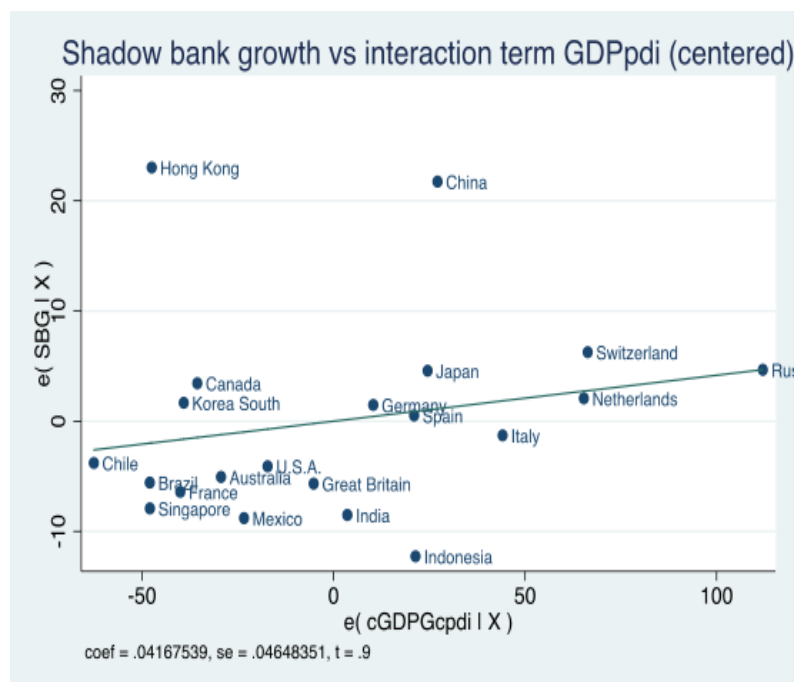
Introducing GDP as a control variable shows significance with shadow banking growth but again with potential outliers of China and Hong Kong. Therefore these countries will be analyzed for outlier.



**Figure 4 - Graph of shadow banking growth against GDP growth**



**Figure 5 - Graph of shadow banking growth against the centred interaction term**





Introducing GDP as a control variable shows significance with shadow banking growth but again with potential outliers of China and Hong Kong.

### **Detection and treatment of potential outliers**

Cook's distance  $D$  is used to estimate of the influence of a data point. These can be assessed using Cook's distance to see if there is distortion when performing a least-squares regression analysis. Cook's distance can be to indicate influential data points that are particularly worth checking for validity.

**Cook's distance  $D$**  show the difference between beta's estimated with and without individual  $i$ . Influence of each individual score on the estimations. Critical value Cook's  $D$ :  $> 4/n$ . The values were 1.32 and 2.68 for Ireland and Argentina respectively.

Lever measures the distance of the value of an individual on a predictor to the center of the values of the other individuals on that predictor. Lever is about zero for values in the center (no influence). Larger values of Lever indicate larger distance from the center and stronger influence on the own fit of the case.

$$L = 2 \cdot p/n \text{ where } p = \text{predictors, } n = \text{number of case.}$$

The values were 0.99 for Ireland and 0.95 for Argentina.

Both these measures indicate that Ireland and Argentina are both outliers and should be left out of the data set.



#### 6.4.6.Explaining indulgence versus restraint

Figure 6 - Graph of shadow banking growth against indulgence versus restraint

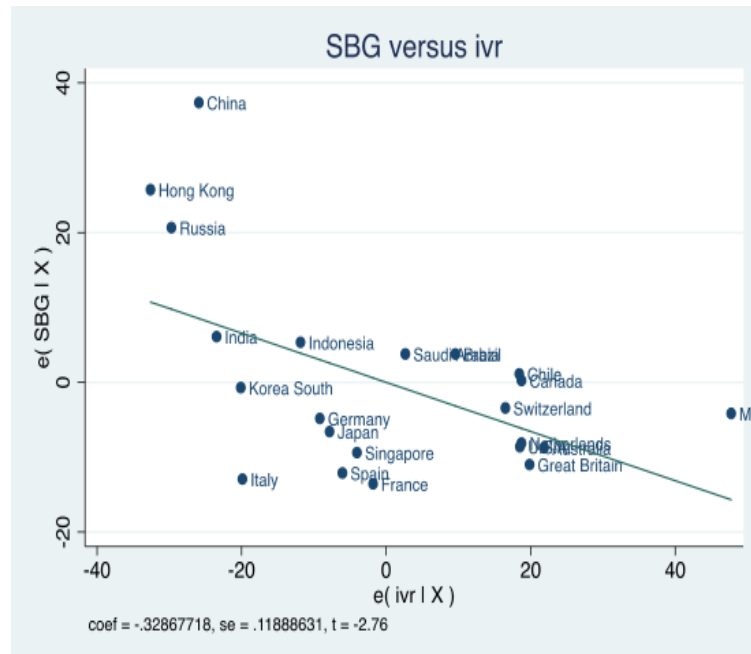


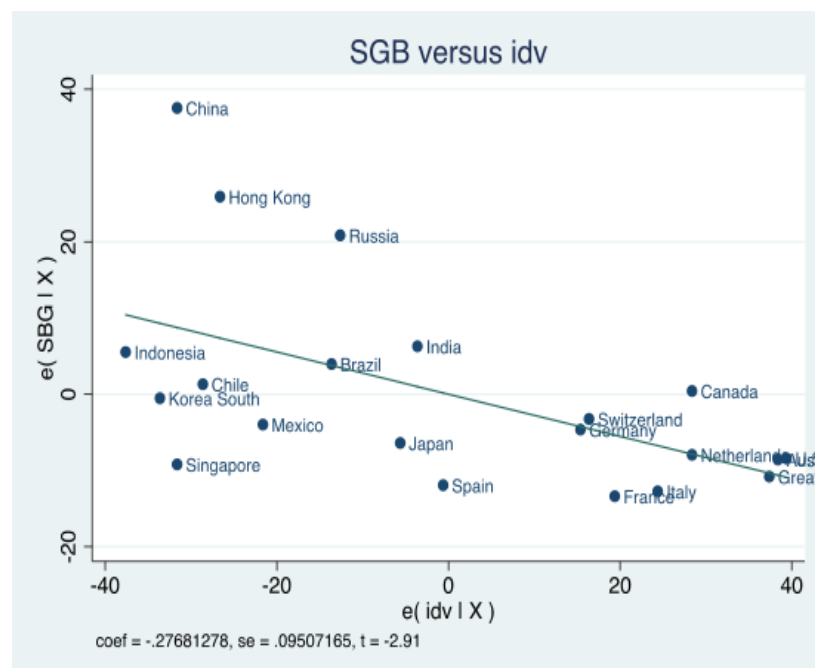
Table 5 - Simple OLS regression of shadow banking and indulgence versus restraint

(1)	
VARIABLES	SBG
ivr	-0.329** (0.119)
Constant	27.62*** (6.377)
Observations	22
R-squared	0.276

The regression and table and scatterplot confirm a moderate negative relationship between indulgence versus restraint and shadow bank growth. This was predicted by the theory.

### 6.3.2 Explaining individualism versus collectivism

**Figure 7 - Graph of shadow banking against individualism versus collectivism**



The regression and table and scatterplot confirm a moderate negative relationship between individualism vs collectivism and shadow bank growth. This has not confirmed the theory as evidence was found to be contradictory, a high score in idv. would therefore indicate low shadow banking activity. This could perhaps be explained by collectivism and that countries with high participation in shadow banking are “opting in” as a group and acting collectively after watching other countries partake.



**Table 6 - Simple OLS regression of shadow banking growth and indulgence versus restraint**

(1)	
VARIABLES	SBG
idv	-0.277** (0.0951)
Constant	25.43*** (6.287)
Observations	21
R-squared	0.309

Standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## 6.5 Results summary

**Table 7 - The Pearson's correlation table**

	SBG	pdi	idv	mas	uai	ltowvs	ivr
SBG	1.0000						
pdi	0.5607	1.0000					
idv	-0.5555	-0.7830	1.0000				
mas	-0.0324	-0.1844	0.1570	1.0000			
uai	-0.2235	0.1048	-0.0326	-0.0815	1.0000		
ltowvs	0.2684	0.1602	-0.3437	0.0533	0.0654	1.0000	
ivr	-0.5258	-0.4285	0.4108	0.0064	0.0580	-0.6621	1.0000



The Pearson correlation coefficient  $r$  shows the strength and direction of association of 2 variables with  $0.1 < r > 0.3$  is equal to a small correlation, with  $0.3 < r > 0.5$  is equal to a moderate correlation and where  $r$  is greater than 0.5 there is a strong correlation. Therefore as none of the correlations were over 0.6.

The table indicates a moderate positive correlation between the power distance index and shadow banking growth and a small positive correlation between long-term time orientation and shadow banking growth. There is a strong negative correlation between individualism versus collectivism and shadow banking growth and a strong negative correlation between indulgence versus restraint and shadow banking growth.

Therefore the results show that the empirical evidence does not confirm the theory in all hypotheses. There is a dominant hypothesis among the five derived and that is there is a strong negative correlation between individualistic countries and shadow banking and a moderate negative correlation between indulgent countries and shadow banking. Another moderate correlation is found between power distance and shadow banking. Statistically insignificant were masculinity vs femininity, long-term orientation and uncertainty avoidance.

These results above verify the complexity of growth in shadow banking amongst nations as it is very varied and dynamic, it's concept changes quickly over time embracing financial innovation. Therefore Hofstede's dimensions of culture are still relevant despite this analysis involving a longitudinal data set at a fixed point in time. However because of the fact that developed financial systems have different shadow banking growth criteria to those of emerging markets, this makes conclusions more difficult.

## **7. Policy Recommendations**

### **7.1 Future regulation and policy goals**

The FSB came up with plans to use assessment of shadow banking activity and relate that to the information of the 4 activities mentioned ie maturity and liquidity transformation, credit risk transfer and leverage to formulate systemic risk mapping although allowances were not made for cross border activity.

**Figure 8: Systemic risk mapping**

SB Risk factors	Key information items*
1. Credit Intermediation	<ul style="list-style-type: none"> <li>• Credit assets / Total assets</li> </ul>
2. Maturity Transformation	<ul style="list-style-type: none"> <li>• Long-term assets to total assets</li> <li>• Short-term liabilities to total assets</li> </ul>
3. Liquidity Transformation	<ul style="list-style-type: none"> <li>• Liquid assets to total assets</li> <li>• Short-term liabilities to total assets</li> </ul>
4. Credit Risk Transfer	<ul style="list-style-type: none"> <li>• Off-balance sheet exposures outstanding divided by NAV</li> <li>• Off-balance sheet exposures outstanding divided by gross assets</li> <li>• Funding from the parent company or its affiliates divided by liabilities</li> <li>• Credit insurance/guarantees divided by capital</li> <li>• Securitisation exposures retained or purchased by the originator (or sponsor) divided by total securitisation</li> </ul>
5. Leverage	<ul style="list-style-type: none"> <li>• Balance-sheet leverage (Assets to Capital)</li> <li>• Off-balance sheet leverage (Off-balance sheet assets / capital)</li> <li>• Fund leverage (Total borrowing + NAV)/NAV</li> </ul>

\*: Jurisdictions may use other information items if the listed items are not available.

Source: The FSB laid out its two pronged strategy in the Progress Report & Roadmap

2015





It instigated and developed a world system-wide framework to track developments in the shadow banking system with a view to seeing the build-up of systematic risks and commencing corrective areas where possible.

Secondly policy in five areas where oversight and regulation needs to be strengthened

- Mitigating risks in banks' interactions with shadow banking participants.
- Reducing the risk of money market funds to runs.
- Improving transparency and aligning incentives in securitization
- Dampening pro-cyclicality (in common with Basle III)
- Identifying financial stability risks posed by other shadow banking entities

In June 2016 the FSB singled out the asset management sector and published the Proposed Policy Recommendations to Address Structural Vulnerabilities from Asset Management Activities. This policy document was concerned with the structural weaknesses from asset management activities that would cause systematic risk.

- Liquidity mis-matches between investments and redemption terms
- Operational risk and challenges in transferring investments mandates.
- Securities lending activities of asset managers and funds.

The FSB sights the growth in the activity of asset management to be the most significant systematic risk factor and that they are often very large and complex operations affording therefore a great deal of leverage. The FSB then offers structure via a tool kit and statistics so they can identify the above mentioned risks and deal with them appropriately and swiftly.

## **7.2 Theoretical solution**

A country's values are not strongly connected to the differences in identity but in the organization itself and functioning of its institutions, the foundations of which can be found in organizational theory. Therefore consequently by importing foreign institutional policy cannot change the way people think. Likewise supranational institutions such as World Bank have met with large resistance. Therefore it is considered useful to relate the differences among countries



in the leaps in shadow banking activity to traits found in cultural dimensions in order to understand why it has arisen and how to deal with it.

Shadow banking in countries such as India and China has been around for a while and the authorities do not classify the activity as outside the regular banking activity.

## **8. Conclusions**

### **8.1 Key findings**

The main analysis of this cross-sectional data set whereby we looked at the relationship between the growth in shadow banking amongst nations with respect to Hofstede's dimensions of culture. The empirical evidence indicates a moderate positive correlation between the power distance index and shadow banking growth. There is a strong negative correlation between individualism and shadow banking growth and moderate negative correlation between indulgence versus restraint and shadow banking growth. This outcome was partly confirmed with theory but shadow banking remains a diversified and fragmented sector with ever new technology dictating new activities.

### **8.2 Limitations of research**

The main limitation is the time scale, the FSB data base of growth in shadow banking is from 2011 to 2014 and the WVS data is from 2010-2014 means data is approximately collected at the same time and in fact the time series range of four years for shadow banking growth is extremely narrow and therefore viewed as longitudinal..

Shadow banking data is very difficult to obtain from the respective monetary authorities, this is partly due to some countries not wanting to share the information and in the case of emerging and developing countries, an inadequacy of resources and systems to do so. Also classification, the FSB concedes in the Global shadow banking monitor report of 2015 that China did not agree with the classification of certain of entity types described as shadow banking.



Monitoring and detecting new adaptations of shadow banking within the sector has proved difficult as the growth has been so fast. Therefore definitions of shadow banking are thought to be dynamic as they are constantly changing.

Cross-border regulatory arbitrage is often not included in estimates and therefore the risk of double-counting once detecting is equally as likely.

Detecting shadow banking activity lying outside the shadow banking sector. This is often the case where shadow banking has grown organically within the entity. Individual country difference of aggregating data which have been outlined above.

Therefore there is still a lack of number of countries just 26 jurisdictions is not normally enough to produce reliable research and this must then be repeated.

The most obvious limitations of the WVS research concerns the time series of data of both the data sets, the WVS uses the 2010 data and is therefore static, the shadow banking growth data supplied by the FSB is for growth from 2009 till 2012 therefore there is an overlap.

Another argument against the data provided is that the WVS measures marginal preference in contrast to absolute value. Maasland and van Hoorn in their paper “ “Measuring values for cross-cultural research February 20009 ” concluded that value measures are superior to marginal preferences for survey based value indicators.

For interpreting value surveys, a value is attached to extra satiation of an objective and tells us nothing about the underlying tastes for objectives in general. Each objective, however unimportant or important a point is reached where no additional units of that objective will allow it to take precedence over other objectives. When more or little police is added, even the most law abiding citizen will not care whether extra policemen are on street duty or not. Then to make the conclusion that the person attaches little value to law and order is in this case incorrect (Maasland and van Hoorn 2008), they concluded therefore value surveys elicit marginal preferences and not values and the former are flawed instruments for measuring cultural differences. This is because marginal preference decreases after the saturation point is found implying a negative correlation. They then look at alternatives such as different value indicators to alleviate the marginal-preference dilemmas, recommending cross-cultural heterogeneity in wellbeing functions. As an alternative to the survey based method of valuing.



In the case of shadow banking, respondents are more likely to stress the importance of UCA in a world full of uncertainty, than in a society in which everything is so tightly regulated and in shadow banking's case that the a negative correlation could be found as the alternative to regulated banking comes without financial penalties. Pioneering work such as that Europeans are more hurt by inequality as the Americans and religious individuals care less about income.

Hofstede used country aggregate scores for the 5<sup>th</sup> dimension derived after China was included in the survey and deriving the function LTO. He dropped the assumption of individual scores.

### **8.3 Future of shadow banking**

The landscape of banking is changing dramatically with a move away from traditional banking to non-banking entities. Future of shadow banking is driven by many criteria.

#### **8.3.1 Technology**

Technology as discussed earlier plays a Large3 role in defining the banking landscape. The UK government has announced in February 2016 that they would encourage the use of third parties regarding private banking and the use of open Application Program Interfaces in the banking sector. This would allow the third party access to private accounts held by the holder which could be with different banks, insurance companies and or building societies. The aim is that account holders will gain a better overview of day-to-day transactions via third party management. This again implies a move away from the traditional banks to smaller more specialized entities. Therefore technology is enhancing the monitoring of interconnectivity in both private banking and institutional banking and plays an increasing role in the activity of non-banking entities.

#### **8.3.2 Alternative forms of shadow banking**

Pension funds, hedge funds and mutual funds are looking at shadow credit to finance long term projects such as motorways. FSB reports show trust companies in this sector grew by 42% in 2013 (FSB, 2014).



Therefore alternative types of shadow banking are expanding and the process is dynamic and therefore future research should look at technological developments as well as new participants.

### **8.3.3 Bank concentration**

The statistics in the FSB 2015 shadow banking monitoring report indicate that bank concentration levels play a role in the size of non-banking activity. The advanced economies with mature financial sectors have non-banking sectors that are not only large proportionally to GDP but also in some cases such as Ireland and the Netherlands roughly the same size as the traditional banking sector. However the FSB has not yet reflected the concentration of banks in terms of size and influence of individual banks as many advanced financial economies are dominated by a few traditional banks such as the UK and the Netherlands.

### **8.3.4. Final conclusion and recommendations**

Future research might benefit from adding a time series to the scope of the project and to track the development of shadow banking over the last 10 years starting just before the credit crisis. This would enable the dimensions of culture to be more relevant as their values tend to hold over time (Hofstede 2010).

In emerging markets non-banking entities are in size smaller with respect to GDP, with these countries the traditional banking sector is still more dominant. Therefore further empirical research would be to explore further links between the banking sector and non-financial sector.

Finally this simple OLS regression could be expanded to a multi-level by for example dividing the nations into groups such as emerging markets and advanced financial economies as Lee pointed out in her paper on the impact of Basle III on shadow economies defining shadow banking creation out of both organic versus absence necessity (Lee, 2015).

Therefore the area of shadow banking still has many interesting areas of research still to be utilized and has changed the industry for the traditional sector. This analysis has provided insight into the leap in shadow banking growth in a short time period and hopefully provoked interest into how this sector will progress in the future.



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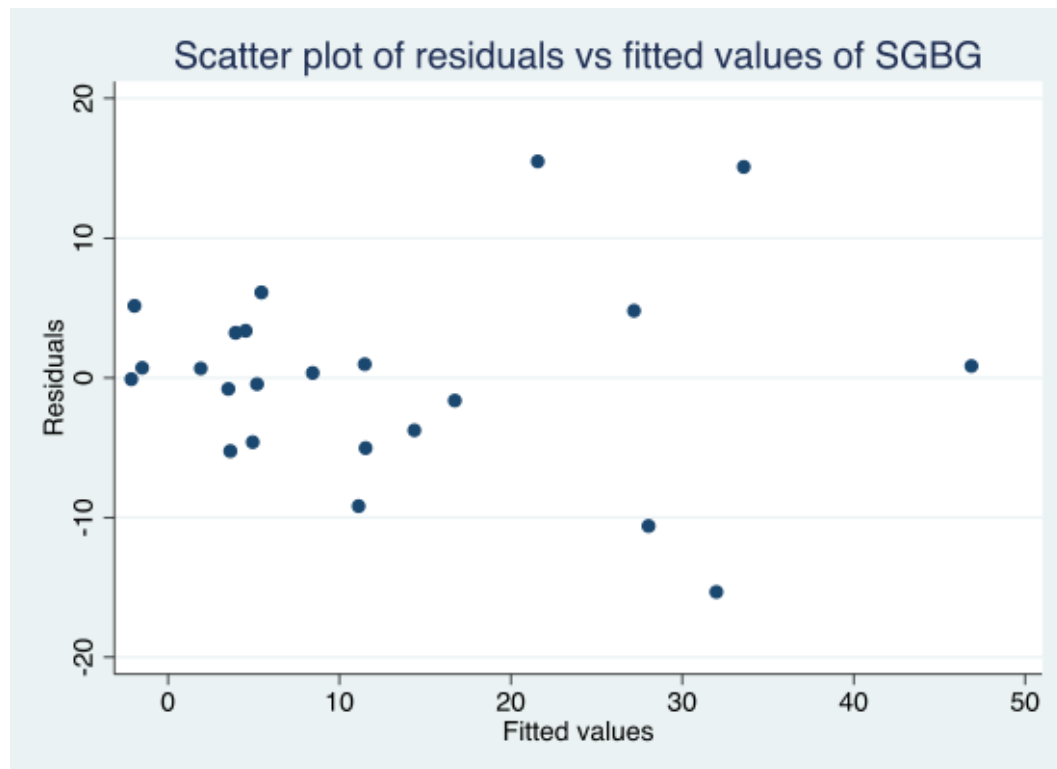
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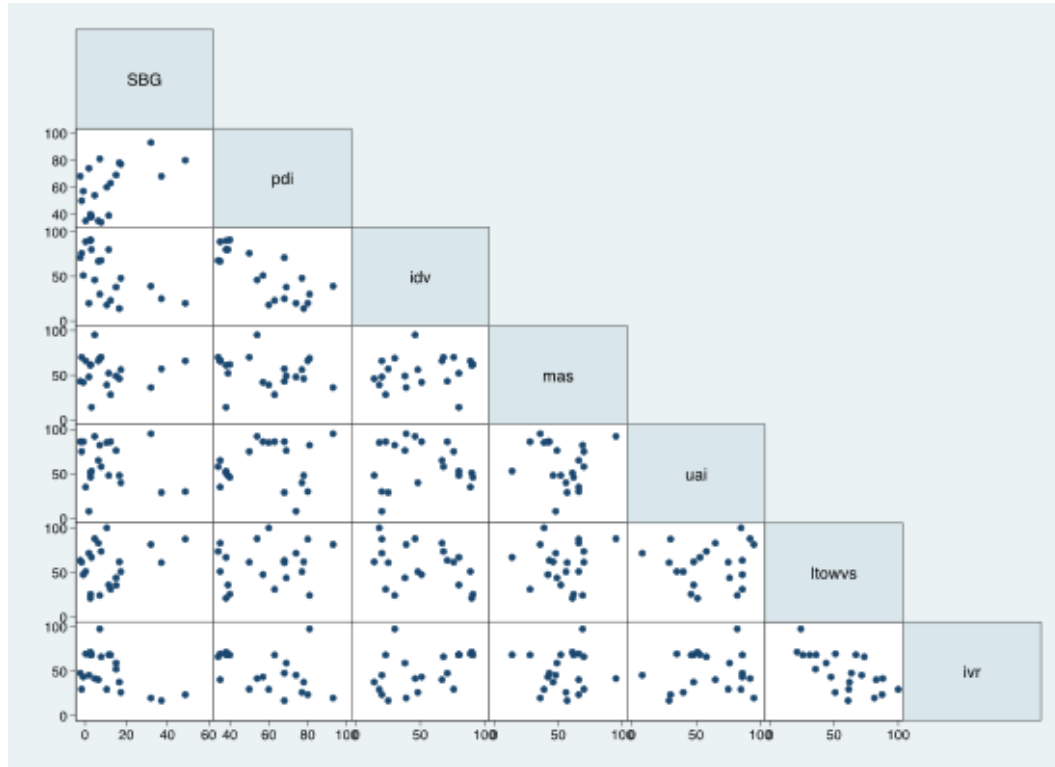
## Appendixes

### A Scatter plot of residuals vs fitted values of shadow banking growth



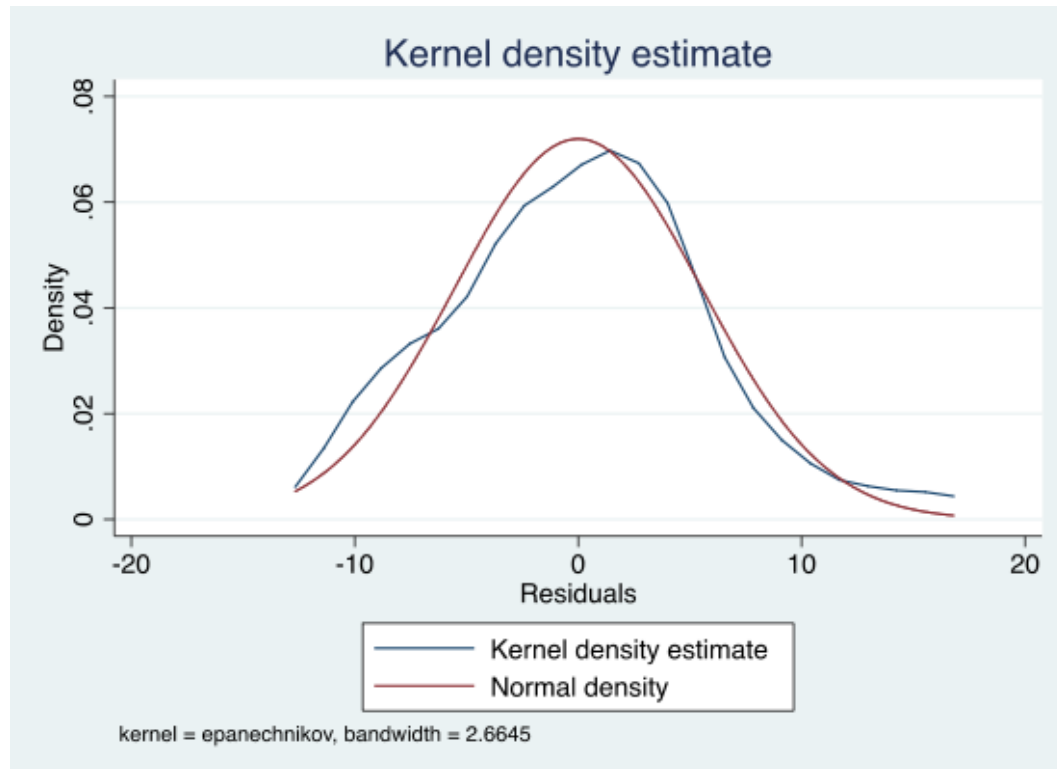


## B Matrix graph of scatter plots of variables



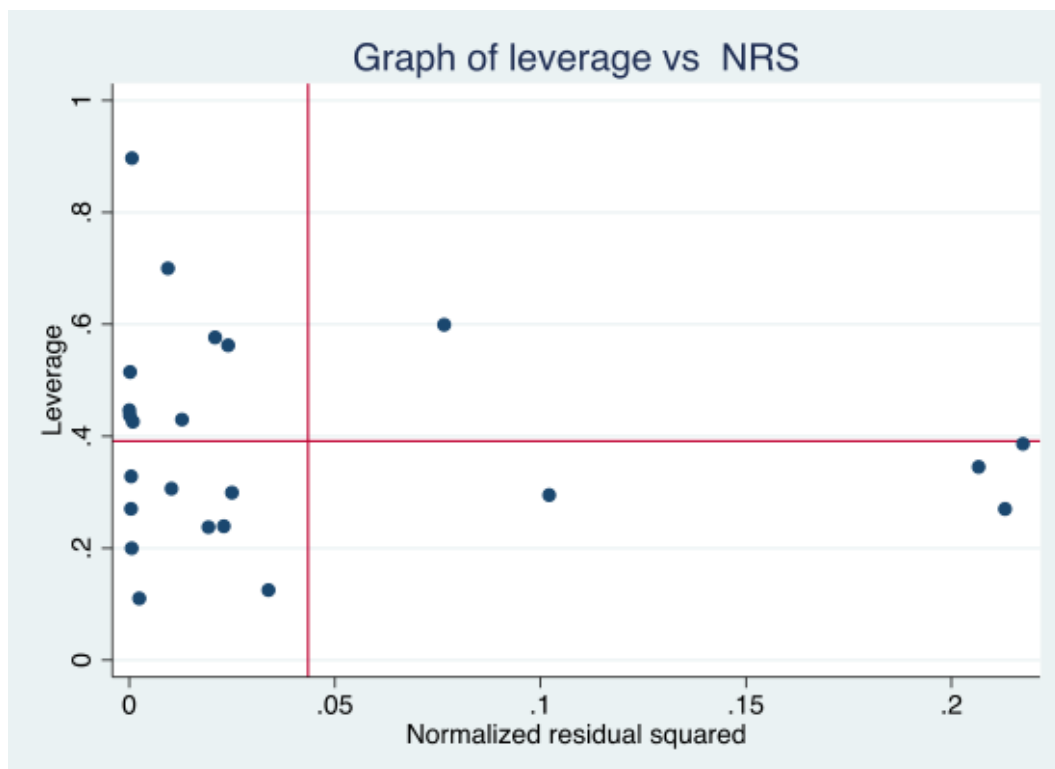
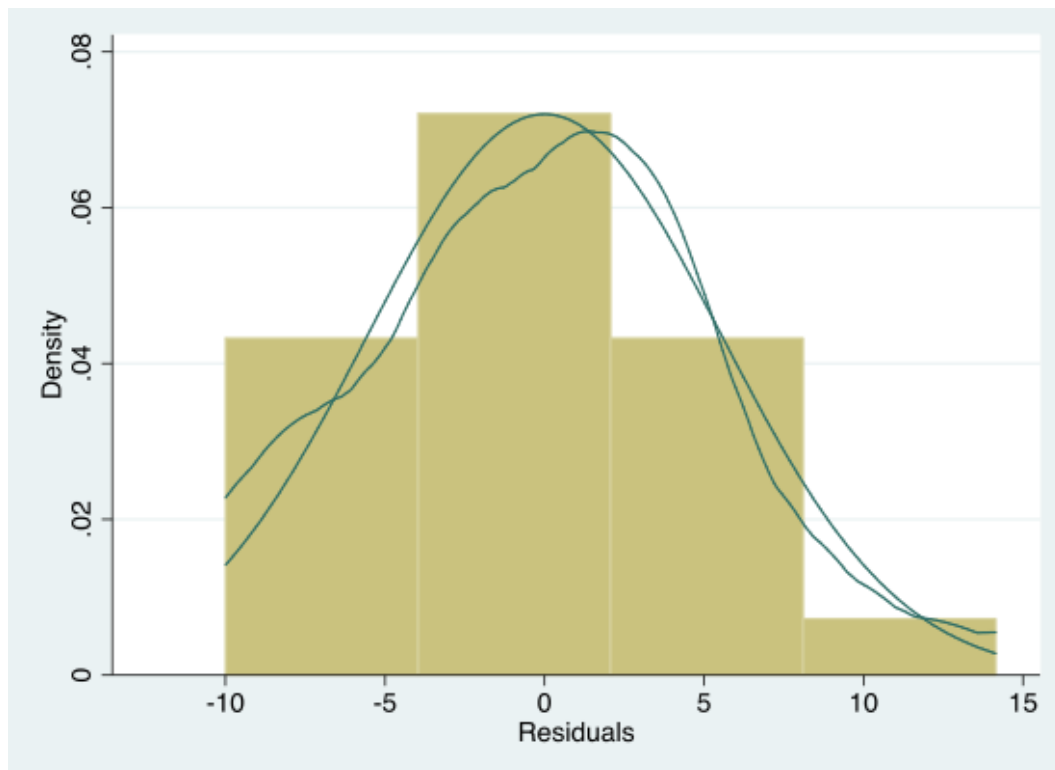


## C Kernel density estimate





## D Graph of leverage against Normal Residual Squared





## E Cultural dimensions showing no significance after regression

	(1)	(2)	(3)
VARIABLES	Model 1	Model 2	Model 3
mas	-0.0246 (0.174)	-0.0388 (0.175)	-0.0527 (0.171)
uai		-0.124 (0.125)	-0.136 (0.123)
ltowvs			0.182 (0.132)
Constant	12.47 (9.893)	20.76 (12.97)	11.57 (14.30)
Observations	21	21	21
R-squared	0.001	0.053	0.148

Standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1



## F Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
SBG	22	11.31944	13.09412	-2.241028	48.68421
GDPG	22	5.461585	4.275458	-.5231898	12.6633
pdi	21	58.61905	18.43496	34	93
cGDPGcpdi	21	48.02029	60.18291	-50.60886	189.7615
SBA	22	1315.509	2775.527	6.6	12788.7
SB	22	41.59091	35.91214	1	147
SPI	22	6.377273	1.059169	4.3	8.3
SBAC	22	.0909091	1.573564	-2.7	6.1
idv	21	51.61905	26.86722	14	91
mas	21	54.04762	17.59965	14	95
uai	21	60.66667	24.58726	8	95
ltowvs	22	57.56812	22.80976	21.15869	100
ivr	22	49.58036	20.94837	16.96429	97.32143



## G Cooks Distance and Lever value

Country	Cook's distance	Leverage
Australia	0.006218547	0.314546227
Canada	0.014107336	0.405051619
France	0.08735276	0.678725421
Germany	0.017602602	0.254884034
Hong Kong	0.405398279	0.426353663
Ireland	<b>1.324277401</b>	<b>0.995563269</b>
Italy	0.027098836	0.332321972
Japan	0.153892905	0.643324196
Korea South	0.122720212	0.547323108
Netherlands	0.343929142	0.649818122
Singapore	0.181133568	0.692885041
Spain	3.37576E-07	0.383172512
Switzerland	0.005434127	0.346488029
Great Britain	0.008780845	0.420632482
U.S.A.	0.00223968	0.256092727
Argentina	<b>2.679198027</b>	<b>0.954516828</b>
Brazil	0.00061135	0.13537024
Chile	0.001709803	0.473526984
China	0.695573926	0.84922725
India	0.077537879	0.350329429
Indonesia	0.211928979	0.485166222
Mexico	0.044113316	0.711588264
Russia	0.489389241	0.693092346



## H The VIF values

Variable	VIF	1/VIF
GDPG	3.95	0.253227
pdi	3.63	0.275190
cGDPGcpdi	3.03	0.330384
SB	2.82	0.354708
SPI	2.31	0.433093
SBAC	1.83	0.546528
SBA	1.51	0.661453
Mean VIF	2.73	



## I Protecting Minority Investors Methodology

Table 1 - What do the protecting minority investors indicators measure?

<b>Extent of disclosure index (0–10)</b>	<b>Extent of shareholder rights index (0–10)</b>
Review and approval requirements for related-party transactions	Shareholders' rights and role in major corporate decisions
Internal, immediate and periodic disclosure requirements for related-party transactions	
<b>Extent of director liability index (0–10)</b>	<b>Extent of ownership and control index (0–10)</b>
Minority shareholders' ability to sue and hold interested directors liable for prejudicial related-party transactions	Governance safeguards protecting shareholders from undue board control and entrenchment
Available legal remedies (damages, disgorgement of profits, fines, imprisonment, rescission of transactions)	
<b>Ease of shareholder suits index (0–10)</b>	<b>Extent of corporate transparency index (0–10)</b>
Access to internal corporate documents	Corporate transparency on ownership stakes, compensation, audits and financial prospects
Evidence obtainable during trial	
Allocation of legal expenses	
<b>Extent of conflict of interest regulation index (0–10)</b>	<b>Extent of shareholder governance index (0–10)</b>
Simple average of the extent of disclosure, extent of director liability and ease of shareholder suits indices	Simple average of the extent of shareholder rights, extent of ownership and control and extent of corporate transparency indices
<b>Strength of minority investor protection index (0–10)</b>	
Simple average of the extent of conflict of interest regulation and extent of shareholder governance indices	

Source: The World Bank Group 2016