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Culture, Corporate Governance and Bank Risk-taking

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Abstract

This thesis analyses the relationship between culture, corporate governance and bank-risk taking. I use a mediation analysis with multilevel data and a dataset containing 168 banks from 28 countries. Two proxies for risk-taking are used: standard deviation of return on assets and the z-score. For the standard deviation of return on assets, individualism has a negative effect, while uncertainty avoidance and power distance are positive, but no mediation effect could be found. For the z-score, most cultural variables are insignificant, however they only turned insignificant after the inclusion of the corporate governance proxies which points toward a mitigation effect. In conclusion it seems likely that corporate governance mediates and weakens the effect of culture.

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1. Introduction

After the financial crisis in 2008, the importance of bank risk-taking has become clear and much research was done on that topic. The effect of multiple factors had been analysed, among others the effect of culture (Ashraf et al., 2016; Bussoli, 2017; Mourouzidou-Damtsa et al., 2019) and of corporate governance (Boubaker et al., 2016; John et al., 2008; Laeven & Levine, 2009; Paligorova, 2011; Srivastav & Hagendorff, 2016).

Previous research often finds that risk-taking is higher in individualistic countries (Ashraf et al., 2016; Bussoli, 2017; Mourouzidou-Damtsa et al., 2019), however some discover a negative relationship between the two (Kreiser et al., 2010). Uncertainty avoidance and power distance are supposed to decrease risk-taking (Ashraf et al., 2016; Kreiser et al., 2010). Corporate governance influences risk-taking as well. For example, shareholder protection rights usually lead to higher risk-taking (John et al., 2008) and a high ownership concentration causes higher risk taking (Boubaker et al., 2016; Laeven & Levine, 2009; Paligorova, 2011).

However, not many researchers have analysed the confounding effect of culture and corporate governance at the same time. To my knowledge, the only paper who analysed this in depth for banks is a paper by Illiashenko and Laidroo (2020). They investigate the cushioning hypothesis, which theorizes that individuals in collectivistic countries take on more risk since family and friends will support them when they fail. They predict that a similar logic could be applied to banks as well, for example banks could speculate that they will be saved by the government in case of failure. In that case, individualism itself does not lead to higher risk-taking, as was found by previous research, but it encourages a corporate governance which in turn will lead to higher risk-taking. They find that when corporate governance is included, the relationship between risk-taking and individualism turns positive. The higher risk-taking in individualistic countries would in that case not be caused by culture itself, but they would tend to have a more risk-inducing corporate governance, for example higher shareholder rights could increase risk-taking.

They are the only ones who analysed the effect of culture and corporate governance on bank-risk taking, however Li et al. (2013) looked at it from corporate risk-taking and find no cushioning effect. They find that individualism has a positive effect on risk-taking and certain corporate governance practices either strengthen or slightly weaken the effect, and that uncertainty avoidance has a negative effect.

To my knowledge only these two papers have investigated the relationship between culture, corporate governance and risk-taking. Not much research was done yet in that direction and

Illiashenko and Laidroo (2020) and Li et al. (2013) find different results from each other. There is a gap in the literature regarding why they find these different results. Is it the different methodology or is it due to different proxies for corporate governance? While Li et al. (2013) included investor protection and variables measuring a country's performance, Illiashenko and Laidroo (2020) look at compensation practices. Since corporate governance has a very broad definition and applying different proxies for it may lead to different results. This paper assesses corporate governance through shareholder power with the two proxies revised anti-director rights and the concentration of shareholders. The former is similar to the proxies used for investor protection by Li et al. (2013), the latter has not been used so far. Also, Illiashenko and Laidroo (2020) mostly focus on individualism and just look shortly at uncertainty avoidance which raises the question if the cushioning hypothesis also holds for other cultural values, such as uncertainty avoidance and power distance and if the negative sign of individualism will still hold when these factors are included as well. This leads to the following research question: "Does corporate governance mediate the effect of culture on risk-taking in Europe in 2019?" This paper only looks at Europe because the BoardEX license only applies to these countries.

In this paper, the proxies for culture will be individualism, uncertainty avoidance and power distance. Corporate governance has, as mentioned above, a very broad definition, but only a few proxies can be considered. I will focus on the power of shareholders which is measured through shareholder protection rights and shareholder percentages. Two proxies for risk-taking are used, the standard deviation of return on asset and the z-score. 168 listed banks are in the data set from 28 different countries from the year 2019. A mediation analysis is conducted with multilevel data. Multiple models are run to examine the research question with different proxies for culture, risk-taking and corporate governance and all models are also run once without controls.

When looking at the standard deviation of return on assets, the results show that individualism decreases risk-taking, while uncertainty avoidance and power distance increase risk-taking, they chime in with the results obtained by Illiashenko and Laidroo (2020). The cultural variables are insignificant without controls and uncertainty avoidance is insignificant once as well. It is possible that one of the control variables has a mitigating effect as well. When a different proxy is used, the z-score, most cultural variables turn insignificant. These variables were still significant when no control variables were included, corporate governance as well as some controls appear to have a mitigating effect. For the models without controls, a mitigating effect of corporate governance can be found and some effects are significant.

The rest of the paper is organised as follows: Section 2 is the literature review which introduces the hypotheses, Section 3 will explain the methodology. Section 4 presents the results and finally in Section 5 there will be a discussion and conclusion.

2. Literature Review

To further investigate the cushioning hypothesis, it is important to know the relationship between culture and risk-taking, and corporate governance and risk-taking and how culture may affect corporate risk-taking. In order to better understand the relationships between these three variables, this section will first explain the effect of culture on risk-taking, followed by the relationship of corporate governance and risk-taking and finally how culture affects corporate governance.

In more individualistic countries, individuals are expected to look after themselves and their immediate family (Hofstede, 2011). Therefore, decisions are made more often by individuals than a whole group. Since individuals are more risk-tolerant than a group and their decisions are theorized to be more often driven by overconfidence and over-optimism (Ashraf et al., 2016), it is hypothesised that risk-taking is higher in individualistic than in collectivistic countries. The literature often found a positive relationship between risk-taking and individualism (Ashraf et al., 2016; Breuer et al., 2014; Bussoli, 2017; Mourouzidou-Damtsa et al., 2019). However, not every researcher found this relationship, for example Kreiser et al. (2010) find an insignificant and negative relationship and that companies have a similar attitude towards risk independent if they are from a collectivistic or individualistic country. It is possible that individualistic characteristic can both encourage and discourage risk-taking (Kreiser et al., 2010).

Uncertainty avoidance is not necessarily related to risk aversion (Hofstede, 2011). In fact, it measures how a society deals with ambiguity. High uncertainty avoiding countries can still take known risks, but do not want to take unknown risks (Ashraf et al., 2016). However, these countries want to limit uncertain situation by establishing strict rules. Due to this, they tend to have a more risk-averse, bank-based system (Kwok & Tadesse, 2006), which leads to the conclusion that the risk-taking will be lower in these countries. Similarly, managers in uncertainty-accepting countries were shown to be more achievement driven and ambitious and are therefore more willing to take risks (Kreiser et al., 2010). A negative relationship was often found by the literature (Ashraf et al., 2016; Bussoli, 2017; Kreiser et al., 2010). However, there are also papers who find an insignificant relationship between the two (Breuer et al., 2014).

Power distance measures the willingness to accept the unequal distribution of power in a society (Hofstede, 2011). The lower the score is, the more equal is the power distribution. It is theorized that in countries with a low power distance, individuals have more freedom in their choices (Ashraf et al., 2016). In low power distance countries, managers will seek to better their own position and that of the bank by taking higher risks, while managers in high power distance countries want to solidify their position by taking less risks (Kreiser et al., 2010). Therefore, there is often a negative relationship found between risk-taking and power distance (Ashraf et al., 2016; Kreiser et al., 2010). But there are papers who find a positive relationship, sometimes even a significant one (Breuer et al., 2014).

As mentioned above, corporate governance is a very broad field, it is only possible to focus on some aspects of it. In this paper, corporate governance will be assessed over the amount of power shareholders hold over the company, measured through shareholder protection rights and the concentration of shareholder power. So, what could be the possible effect of these two factors on risk-taking?

When investors are protected by laws such as anti-director rights, they encourage managers to take on more risk (John et al., 2008). For example, when investors are not protected by rights, insiders will protect their investment by preventing the bank from engaging in risky investments. Similarly, large shareholders have a high exposure to the bank they invested in and will play it safe when there are no laws which protect them. Also, controlling shareholders will have more difficulties to make profits with conservative strategies when shareholders protection rights are strong, and they will take therefor more risk (Paligorova, 2011). Previous research has found that higher shareholder rights lead to higher risk-taking (John et al., 2008; Paligorova, 2011).

However, there are also other ways through which shareholders can influence risk-taking. According to Laeven and Levine (2009) large shareholders have more power and incentives to influence risk-taking due to their voting power and their large cash flows. Large shareholders also have more incentives to increase a bank's profit through risky projects (Paligorova, 2011). However, this effect could be weakened if large shareholders did not diversify and have a high exposure to a single firm. Also, large shareholders are more likely to increase risk-taking if multiple of them are in a firm (Boubaker et al., 2016). Their results show that large shareholders advocate and increase risk-taking (Boubaker et al., 2016; Laeven & Levine, 2009; Paligorova, 2011).

As stated above, a proxy for corporate governance used in this paper is investor legal rights created by La Porta et al. (1998). While Common Law and Civil Law were shown to affect

legal protection (La Porta et al., 1998), the legal families are not necessarily related to culture because these rules were sometimes brought in through colonialism and are therefore spread out around the whole world. Culture is not necessarily related to institutions and corporate governance which still makes it an important variable. Licht et al. (2005) compared investor legal rights to national culture. Anti-director rights, which measures the number of rights granted to shareholders, have a negative relation with uncertainty avoidance and power distance, while individualism has a positive effect. This implies that in countries with high individualism, shareholders are more protected which could lead them to encourage risk-taking. This would be consistent with the cushioning hypothesis (Illiashenko & Laidroo, 2020). There are also other ways how culture can affect shareholders rights. For example, Griffin et al. (2017) find that individualistic countries are more likely to have an Anglo-Saxon approach, a market-based system, which refers among others to equity-based pay, board independence, but also to better shareholder voting rights, while uncertainty avoiding countries tend to not have an Anglo-Saxon approach and lower shareholder rights. Also, high uncertainty avoiding countries tend to have a bank-based system which usually indicates lower shareholder protection rights (Kwok & Tadesse, 2006). Countries which score high on individualism and uncertainty avoidance are more likely to have and follow the rules, which leads to a better corporate governance, which refers to a company's capacity to control its rights and responsibilities (Duong et al., 2016). It is based upon multiple pillars, one of which is shareholder rights. The interpretation of the rules depends on the national culture as well.

Previous research also find that culture can influence the concentration of ownership. For example, in a more egalitarian country, shareholder concentration is usually higher (Holderness, 2017). While egalitarianism is taken from the Schwartz index it is related to power distance, since both look at the distribution of power in a society, so it is possible that a low power distance will lead to a higher shareholder percentage as well. A possible explanation for this is that having large shareholders is beneficial for a company to handle employees who have strong legal rights. Holderness (2017) finds that individualism has a positive effect on concentrated ownership as well, but it is only significant in emerging markets. Lv and Li (2015) find that when formal institutions are weak, informal institutions such as collectivism will drive large shareholders to work together with minority-shareholders and can lead to investment inefficiency. National culture was shown to influence ownership structure, and this effect is even stronger when there is an institutional void (Chakrabarty, 2009). In conclusion, most researcher find that individualism leads to better shareholder protection (Duong et al., 2016; Griffin et al., 2017; Licht et al., 2005). It is less clear for uncertainty avoidance because some

find that they have higher shareholder rights (Duong et al., 2016) or have systems where they are lower (Licht et al., 2005; Kwok & Tadesse, 2006), while power distance decreases shareholder rights (Licht et al., 2005). Holderness (2017) finds that low power distance and high individualism leads to a higher shareholder concentration.

While individualism is usually seen as having a positive relationship with risk-taking, there is reason to believe that this relationship is going to change when corporate governance is included (Illiashenko & Laidroo, 2020). In collectivistic countries, there are strong in-groups, often extended family which will protect the individual (Hofstede, 2011). This leads to the cushioning hypothesis, which states that individuals in collectivistic countries take on more risk since family and friends will support them when they fail. This would imply that the risk-taking is higher in collectivistic countries due to safety nets, but why did previous research not find this negative relationship? According to Illiashenko and Laidroo (2020) the positive relationship is only caused by the exclusion of corporate governance. They assume that the higher risk-taking in individualistic countries is not due to culture but caused by risk-inducing compensation practices for managers. On the other hand, Li et al. (2013) find a positive relationship between individualism and risk-taking and find no sign for the cushioning hypothesis. They find that culture has a significant direct effect, but also an indirect effect on institutions, such as investor protection, which in turn influences risk-taking. Sometimes these effects reinforce the cultural effect, and other times they offset it. For the anti-self-dealing index and creditor's rights, the indirect effects are insignificant and negative.

While Illiashenko and Laidroo (2020) focus on the aspect of remuneration to assess corporate governance, this paper will look at the power of shareholders, as that was shown to impact risk-taking as well. For example, shareholder protection rights and large shareholders were shown to increase risk-taking (John et al., 2008; Laeven & Levine, 2009). As these aspects of corporate governance are influenced by culture as well (Duong et al., 2016; Griffin et al., 2017; Holderness, 2017; Licht et al., 2005). It is possible that corporate governance mitigates the effect of culture on risk-taking. This would lead to the following hypothesis:

Hypothesis 1a: Shareholder rights and the presence of a large shareholder mitigate the effect of individualism on the standard deviation of ROA and will cause a negative relationship between the two.

Hypothesis 1b: Shareholder rights and the presence of a large shareholder mitigate the effect of individualism on the z-score and will cause a positive relationship between the two.

It is less clear how including corporate governance will affect the effect of uncertainty avoidance on bank risk-taking. For uncertainty avoidance there is no such theory as the cushioning hypothesis which could explain a change in the expected sign, however Illiashenko and Laidroo (2020) did find a positive, but insignificant relationship between uncertainty avoidance and risk-taking. They theorize that individualism has a stronger effect on risk-taking than uncertainty avoidance and since the two variables are negatively correlated, individualism is dominating the latter. Li et al. (2013) find a negative relationship between uncertainty avoidance and risk-taking. The indirect effects for anti-self-dealing index and creditor's rights are significant and negative. Additionally, uncertainty avoidance does have a negative effect on factors such as anti-director rights (Licht et al., 2016), and lower shareholder rights which will in turn decrease risk-taking (John et al., 2008). If corporate governance has a confounding effect, the sign could change here as well, or it could be possible that individualism is dominating the effect of uncertainty avoidance as theorized by Illiashenko and Laidroo (2020):

Hypothesis 2a: Shareholder rights and the presence of a large shareholder mitigate the effect of uncertainty avoidance on the standard deviation of ROA and will cause a positive and likely insignificant relationship between the two.

Hypothesis 2b: Shareholder rights and the presence of a large shareholder mitigate the effect of uncertainty avoidance on the z-score and will cause a negative and likely insignificant relationship between the two.

Previous research found that power distance has a negative impact on risk-taking because high power distance countries tend to be more conservative. Power distance has a negative effect on share holder protection as well which decreases risk-taking (John et al., 2008; Licht et al., 2016), however it likely will also have a negative relationship with concentrated ownership, and a large-percentage shareholder increases risk-taking (Holderness, 2017; Laeven & Levine, 2009). It is possible that corporate governance has here a mitigating effect as well. For example, in low power distance countries, subordinates are often consulted by the managers (Hofstede, 2011). Since groups are usually more risk-averse than individuals (Ashraf et al., 2016), it is possible that the negative relation between power distance and risk-taking is influenced by corporate governance as well. However, it could also be that the two proxies for corporate governance have different effects on power distance because the latter has different relationships with them as well (Holderness, 2017; Licht et al., 2016):

Hypothesis 3a: Shareholder rights and the presence of a large shareholder mitigate the effect of power distance on the standard deviation of ROA and will cause a positive relationship between the two.

Hypothesis 3b: Shareholder rights and the presence of a large shareholder mitigate the effect of power distance on the z-score and will cause a negative relationship between the two.

3. Methodology

The dataset contains information of banks from 28 countries, which are the 25 member states of the European Union, excluding Cyprus since no cultural data was available for this country, and the United Kingdom, Lithuania, and the United States. Only these countries are included because the BoardEx license only applies to the UK and European countries. In the beginning, 294 banks were in the dataset, however due to missing observations, multiple observations got dropped. In the final dataset, there are still 168 banks. Only listed banks are in the dataset because many unlisted firms will likely not offer the necessary board data. Global banks are included as well, but only the headquarters are shown. From the US and Lithuania, only a few banks are in the dataset, only global banks whose headquarters are in those countries. The data is from the year 2019, because there are many banks who have not yet published their data from the year 2020.

3.1 Method

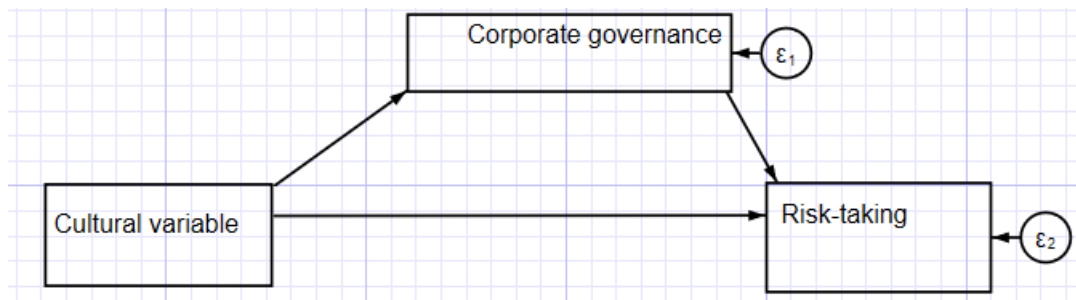


FIGURE 1: MEDIATION ANALYSIS

As shown in Figure 1, this paper analyses a mediation effect. The approach from Baron and Kenny (1986) would be adequate for the analysis, where the analysis is done in three steps, first the effect of culture on risk-taking, then the effect of culture on corporate governance and finally all three can be included in the analysis. The final model including the mediation factor corporate governance can be written as:

$$(1) \text{risktaking} = \alpha_{0j} + \beta_1 \text{culture}_{ij} + \theta \text{corporate governance}_{ij} + \alpha_1 \text{control variables}_{ij} + e_{ij}$$

Where α_{0j} is the random intercept for the multilevel analysis and i denoting the individual economic identity, j the group identity and e is the error term. Culture would be either individualism, uncertainty avoidance or power distance and corporate governance would be shareholder rights or shareholder percentages. Risk-taking is either standard deviation of return on assets or the z-score.

The model to assess the effect of the mediator is:

$$(2) \quad \text{corporate governance} = \alpha_{1j} + \gamma \text{culture}_{ij} + \alpha_1 \text{control variables}_{ij} + e_{ij}$$

Where β_1 from formula 1 shows the direct effect and $\gamma\theta$ is the indirect effect.

Build upon this method is the `ml_mediation` effect, based upon the ideas of Krull and McKinnon (2001) and developed by UCLA (<https://stats.idre.ucla.edu/stata/faq/how-can-i-perform-mediation-with-multilevel-data-method-1/>). This command was developed to allow a mediation analysis with multilevel data. First, this command runs an analysis to find the effect of culture on risk, equation 1, then of culture on corporate governance, equation 2, and finally all variables are included in equation 3. This command gives the direct, indirect and total effects too and offers a bootstrapping option to determine the significance of the effects. This method already got used before, for example by Hua et al. (2016).

For the robustness checks, the method from Li et al. (2013) is used. They analysed the mediation effect with a multilevel analysis with a random coefficient model and multiple calculations to find the direct, indirect and total effects.

3.2. Variables

3.2.1. Measuring Risk-taking

One proxy for risk-taking is the standard deviation of return on asset (Illiaschenko & Laidroo, 2020; Li et al., 2013; Mourouzidou-Damtsa et al., 2019). In order to find the standard deviation, data from the year 2009 to 2019 was used. The standard deviation of return on assets shows the earnings volatility and a higher volatility is indicative to higher risk-taking (Li et al., 2013). So, the higher the standard deviation is, the higher is the risk-taking.

A second proxy for risk-taking is the z-score. It is often used to assess bank-risk taking (Di Tommaso & Thornton, 2020; Illiaschenko & Laidroo, 2020; Laeven & Levine, 2009). A high z-score indicates that the bank has a higher risk-adjusted profit, while a low score indicates a higher risk-taking and higher risk of insolvency. I would use the following formula from Laeven and Levine (2009):

$$(3) \quad z - \text{score} = \frac{ROA + CAR}{\sigma ROA}$$

With ROA being the return on assets, CAR is the capital asset ratio which is calculated as $\frac{E}{A}$, stockholders' equity divided by total assets, and σROA being the standard deviation of return on assets. In order to get the standard deviation, data from 2009 to 2019 was used.

The necessary data for both proxies was gained from Eikon.

3.2.2. Cultural variables

The culture variables are individualism, uncertainty avoidance and power distance. Especially the first two are often used to assess the effect of culture on risk-taking (Ashraf et al., 2016; Breuer et al., 2014; Bussoli, 2017; Illiashenko & Laidroo, 2020; Li et al., 2013; Mourouzidou-Damtsa et al., 2019). Individualism, short IDV, is expected to decrease risk-taking when corporate governance is included, while uncertainty avoidance, short UAI, and power distance, PDI, are expected to have a positive effect. The cultural values developed by Hofstede will be used to assess culture. Since no information is available for Cyprus, this country will be excluded from the analysis. The data is gained from the website Hofstede Insights.

3.2.3. Corporate governance

Corporate governance is a very broad concept and these proxies presented here do not capture all aspects of corporate governance. However, including all possible proxies would exceed the scope of this paper. Future research can look further into possible other variables for corporate governance. This paper will only look at a few proxies.

Shareholder protection rights are very important, especially the anti-director rights (Illiashenko & Laidroo, 2020; John et al., 2008; Laeven & Levine, 2009; Mourouzidou-Damtsa et al., 2019), as it was shown to affect risk taking and is often used in the literature. Low shareholder rights daunt shareholder from encouraging more risk-taking (John et al., 2008) and better shareholder protection will therefor likely increase risk-taking. This paper uses the revised anti-directors right from Djankov et al. (2008), which can range from 0 to 6. The higher the score is the more rights shareholders have. For this variable, no information was available for Malta and Slovenia. Therefore, the average for their legal family, French Civil law, was taken instead. The information for the legal families was gained from a chapter written by La Porta et al. (2017).

It would also be important to know if there are large shareholders in a bank. Large shareholders were often associated with higher risk taking (Laeven & Levine, 2009) since they can use their power to convince the managers to take more risk to increase their own profit (Beck et al., 2009). Shareholders percentage can be found on BankFocus Orbis. Orbis offers an indicator which measures concentrated ownership and applies certain levels to certain amounts of percentages hold based on information from the Bureau van Dijk (BVD), this indicator is called the BVD Independence Indicator. For example, an A indicates that none of the shareholders holds more than 25%, for B at least one shareholder holds above 25% but less than 50%, while C shows that one investor holds more than 50%. For D, one has direct ownership with more than 50% (Horobet et al., 2019).

3.2.4. Control Variables

There are multiple bank-based variables which get used. Bank-based variables refer to variables at the individual level of a bank. These variables have a unique value for each bank and are not determined by the country they are based in.

One of them is the size of the bank which can be measured through logarithm of total assets (Di Tommaso & Thornton, 2020). It can increase risk-taking if a bank is too-big-to-fail and knows that the government will save it in the case of a bankruptcy (Beck et al., 2009). However, it could also be that large banks are better at diversification and can therefore reduce their risk (Iannotta et al., 2013). Other variables are the funding structure calculated through deposits to total assets, which controls for different business strategies (Illiaschenko & Laidroo, 2020). Capital structure, calculated as equity to total assets, is a leverage ratio (Illiaschenko & Laidroo, 2020). A high ratio will increase risk-taking. Then there is the loan loss provision, which has an impact on the volatility of earnings (Bushman & Williams, 2012). It can either increase risk-taking through earnings smoothing, however it can also reduce it if it is used to anticipate future non-performing loans.

Also, revenue streams could be important because it shows how diversified a bank is. A diversified bank will also diversify their risk and reduce it. A possible proxy could be the Herfindahl-Hirschmann Index, short HHI (Mercieca et al., 2007), which can be calculated the following way:

$$(4) \quad HHI = \left(\frac{\text{non - interest income}}{\text{non - interest income} + \text{interest income}} \right)^2 + \left(\frac{\text{interest income}}{\text{non - interest income} + \text{interest income}} \right)^2$$

Government ownership can also influence risk-taking because the government may use these banks to support weak industries (Iannotta et al., 2007). The variable state-owned is 1 if the government has at least 50% of the votes and 0 if otherwise. All of the variables mentioned above are from Eikon.

Different board characteristics can have an influence on risk-taking as well (Srivastav & Hagendorff, 2016). They would also fall under bank-based variables as they are different for each bank. Such board characteristics can be age, gender, or education. According to Srivastav and Hagendorff (2016) a board made up with young people and more women takes more risk. Two variables report on gender, females on board and female managers, both expressed in percentages and from Eikon. The average for each bank is taken. The variable age is from BoardEX.

Another variable could be the power a CEO holds as it influences the effectiveness of boards (Srivastav & Hagendorff, 2016). This paper includes a dummy which shows if the CEO is also on the board. Higher competence allows board members to better assess and understand risk (Srivastav & Hagendorff, 2016). The variable skill expresses the percentage of board members who have a financial background or previous experience in the sector. Both variables are from Eikon. These board variables are different for each bank and are therefor also seen as bank-based variables

Bank-based variables are not enough to run the regression, country level characteristics will be needed such as gross domestic product, GDP, or inflation as well. Kreiser et al. (2010) find that GDP has a negative relationship with risk taking. GDP per capita is corrected for the purchasing power and the logarithm is taken. However, when inflation goes up, the cost of institutions increases which as well could increase the standard deviation and decrease the z-score (Combey & Togbenou, 2017). The harmonised indices of consumer prices, short HICP, is used. Both variables are from Eurostat.

There is also the need to correct for institutions and regulations. Capital stringency is an index that measures regulatory oversight over the capital of a bank (Laeven & Levine, 2009). This paper uses the variable prompt corrective action from Barth et al. (2001) which measures how fast the law will intervene when a bank's solvency deteriorates. A higher score indicates a faster intervention.

4. Results

4.1. Trend Analysis

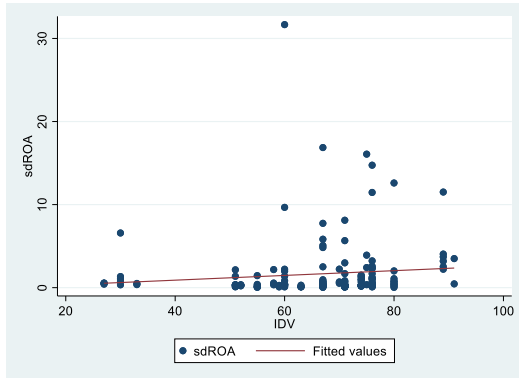


FIGURE 2: SDROA AND IDV

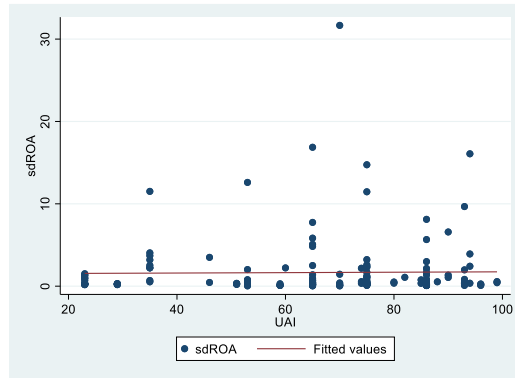


FIGURE 3: SDROA AND UAI

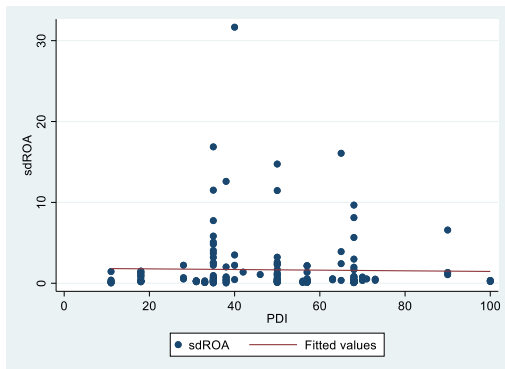


FIGURE 4:SDROA AND PDI

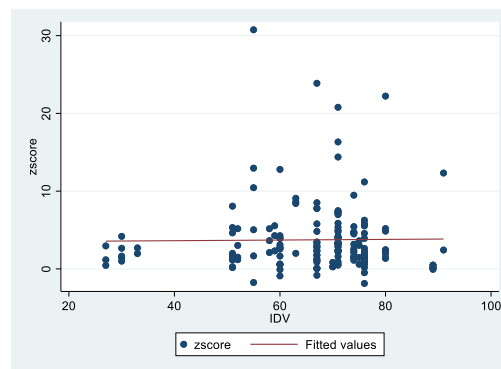


FIGURE 5: Z-SCORE AND IDV

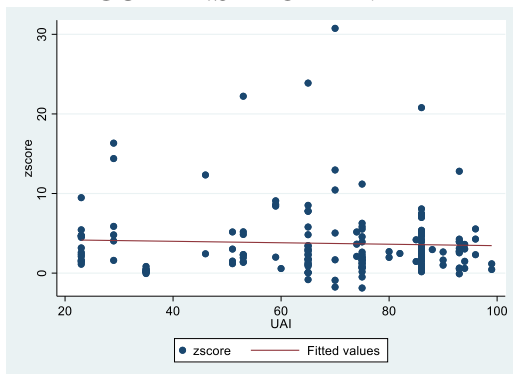


FIGURE 6: Z-SCORE AND UAI

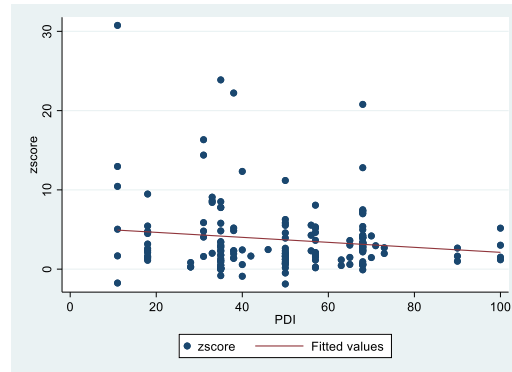


FIGURE 7: Z-SCORE AND PDI

The tables above visualize the correlation between the risk-taking proxies and the cultural variables. In figure 2 there is a slight upward trend which is consistent with the results which were found in table 1 and 2. In figure 3 and 4, the fitted line is almost flat. These results fit with the results from the correlation table, where the coefficient is rather small. Most points have a small value, only some outliers are larger.

As for figure 5 and 6, the line is rigid as well and the correlation is rather small. However, the lines are higher than for figures 2, 3 and 4. Figure 7 has a stronger downward trend, it is

negative in the correlation table as well as in the tables 3 and 4. The stronger trend is an indication that power distance is the only cultural variable which is significant in the models without controls.

The lines are probably flat since the majority of the cultural variables are insignificant when the controls are excluded for the standard deviation of return on assets. In every figure can also some outliers be seen.

4.2. Analysis with standard deviation of return on assets

Table 1 presents the results from a mediation analysis conducted with the anti-director rights. The models 1, 3 and 5 were run without controls, the models 2, 4 and 6 were run with the control variables. A full table with the coefficients for the controls can be found in the appendix.

Anti-director rights are significant when no controls are included, when they are it is only significant for individuality. While Anti-director rights is significant, it does not have a significant relationship with individuality. Anti-director rights are negative in every model. When they are high, risk-taking decreases. Due to this, there does not appear to be a mediation effect. IDV is negative as was theorized by Illiashenko and Laidroo (2020) and supports hypothesis 1a. However, in model 1 IDV is insignificant and positive, it changes its sign and becomes significant only after the controls are added. The controls seem to have a mediation effect as well. UAI is insignificant, however it was negative in model 3 and turns positive after the controls were added. In model 4 UAI was significant in equation 1 and only turned insignificant after anti-director rights was included. However, UAI has no significant effect on anti-director rights and the effects are all insignificant, so this does not seem to be caused by a mediation effect. This is not surprising, as Illiashenko and Laidroo (2020) did find an insignificant result as well and assume that UAI has a weaker effect on risk-taking and is overshadowed by IDV. Also, Breuer et al. (2014) did find an insignificant relationship as well. So, this does support hypothesis 2a. PDI has no significant relationship with anti-director rights in both models, there appears to be no mediation effect. PDI is positive and significant, a higher power distance increases risk-taking, which supports hypothesis 3a. However, as for the other cultural variables, PDI only turns significant and changes its sign after the controls are added.

The coefficients of the controls can be found in the appendix. The logarithm of total assets is always significant and negative, larger banks take less risks. It is possible that they diversify the risk as theorized by Iannotta et al. (2013). Average age is positive, when the average age of board members is higher, risk-taking will be higher as well, this contradicts the theory of Srivastav and Hagendorff (2016), which stated that this would decrease risk-taking. It could be

that older board members are driven by over-confidence and take therefor more risk (Ashraf et al., 2016). Log of GDP has a strong positive effect on risk-taking. This contradicts Kreiser et al. (2010) who found that risk-taking decreased in countries with a high GDP. Inflation, HICP has a positive relationship as well, but only in model 1 and 2, which is consistent with Combey and Togbenou (2017).

The intraclass correlation can range from 0 to 1. The higher it is, the more of the variation of the intercepts is caused by the country level. For the models 2, 4 and 6 it is around 0.6, for model 2 slightly below, for model 4 it is nearly 0.65. A majority of the variation is caused by the country level variables. This was to be expected as most of these control variables are significant while many individual based controls were insignificant. For the models 1, 3 and 5 the intraclass correlation is higher, more of the variation in the standard deviation can be explained through the cultural variables than through anti-director rights. It shows what a large influence culture, anti-director rights and the country level controls have on risk-taking. The log likelihood is a goodness of fit, for these 6 models it is around -410, while it is slightly lower when no controls are included. This could indicate that the explanatory power of the model is rather low, however since it has neither a minimum nor a maximum value it is hard to interpret. The indirect effect shows the odds of the standard deviation when anti-director rights changes from 1 to 5 while the cultural variable is at 100. For models 2 and 4, for IDV and UAI it is negative, anti-director rights will decrease the risk-taking, while when PDI is high, it is positive and anti-director rights will increase the risk-taking. The direct effect shows the odds of the standard deviation when anti-director rights is fixed at 0 and the cultural variable will continuously increase. For UAI and PDI it is positive, the higher one of these variables is, the higher will be the risk-taking, while it is negative for IDV. The total effect is the odds of the standard deviation when the cultural variable increases and is the sum of the direct effect and indirect effect. It is negative for model 1, the total effect is that IDV decreases risk-taking by 0.12. For model 4 and 6 it is positive and increases risk-taking by 0.042 and 0.1 respectively. It is lower in model 4 since it gets offset by the indirect effect. As for the coefficients of the cultural variables, excluding the controls changes the signs of the effects. Since the effects are insignificant, anti-director rights does not seem to have a strong mitigating effect.

TABLE 1: REGRESSION ANALYSIS WITH SDROA AND ANTI-DIRECTOR RIGHTS

	(1) sdROA b/se	(2) sdROA b/se	(3) sdROA b/se	(4) sdROA b/se	(5) sdROA b/se	(6) sdROA b/se
Anti-director rights	-2.09** (1.00)	-1.25* (0.69)	-2.32** (1.05)	-0.88 (0.85)	-2.12** (1.00)	-1.11 (0.73)
IDV	0.020	-0.11**				

	(0.05)	(0.05)				
UAI			-0.029	0.054		
			(0.05)	(0.04)		
PDI					-0.022	0.078*
					(0.05)	(0.04)
Constant	7.77	-91.1***	11.8**	-91.1***	10.2**	-100.7***
	(4.84)	(28.18)	(5.40)	(34.62)	(4.08)	(34.08)
var(u_0j)	1.54***	1.10***	1.54***	1.20***	1.54***	1.15***
	(0.20)	(0.23)	(0.20)	(0.23)	(0.20)	(0.24)
var(e_ij)	1.07***	0.90***	1.06***	0.90***	1.06***	0.90***
	(0.06)	(0.07)	(0.06)	(0.07)	(0.06)	(0.07)
Observations	168	168	168	168	168	168
Controls	No	Yes	No	Yes	No	Yes
Log lik	-448.0	-410.8	-448.0	-412.7	-448.1	-412.0
Intraclass cor	0.722	0.596	0.722	0.644	0.723	0.619
indeff	0.0074	-0.0089	0.033	-0.012	-0.0008	0.025
	(0.04)	(0.11)	(0.04)	(0.04)	(0.03)	(0.05)
direff	0.020	-0.11	-0.029	0.054	-0.022	0.078
	(0.05)	(0.09)	(0.04)	(0.05)	(0.04)	(0.06)
toteff	0.028	-0.12	0.0035	0.042	-0.023	0.10
	(0.02)	(0.14)	(0.02)	(0.06)	(0.04)	(0.08)

Statistical analysis for the proxy revised anti-director rights from Djankov et al. (2008). It is a multilevel analysis combined with a mediation effect, done with the ml_mediation command. The control variables were excluded from the table. Indeff is the indirect effect, direff is the direct effect and toteff the total effect. Their significance level was calculated with a bootstrap of 476 repetitions, respectively 500 for the models 1, 3 and 5. One star indicates a significance at the 10 percent level, two stars a significance at the 5 percent level and three indicates a significance at the 1 percent level. The numbers are shortened to the fourth decimal.

Table 2 shows the mediation analysis done with the BVD independence indicator. The models 1, 3 and 5 are run without controls, the models 2, 4 and 6 include the control variables. A table with the coefficients for the controls is in the appendix.

BVD is insignificant in every model. As before, the cultural variables in the models 1, 3 and 5 are insignificant. For model 1, none of the three equations is significant, while in model 3 and 5 UAI and PDI have a positive and significant effect on BVD. IDV is negative and significant in model 2, but as in table 1, it had a different sign without the controls. PDI has a significant and positive relationship with BVD, however, in model 5 PDI was insignificant and negative. UAI is significant in the model 4 and has the same sign as in model 3. As before UAI is significant in equation 1, including BVD does not cause it to become insignificant in contrast to adding anti-director rights in table 1. The three hypotheses are supported here as well. The control variables have the same signs as before and it is only after the addition of the control variables where the cultural variables turn significant.

The intraclass correlation is again around 0.6, slightly higher for the models 1, 3 and 5, most of the variation can be explained on the country level. Log likelihood is around -410. The indirect effect is negative for model 2, culture decreases standard deviation through the other variables, while it is positive for model 4 and 6. The direct effect is negative for model 2 and

positive for model 4 and 6. The total effect is negative for model 2 and positive for 4 and 6. Just as in table 1, the direct and total effect partly mitigate each other in model 4. Some effects changed their sign when controls were excluded.

Interestingly, when the controls are excluded in both tables, the cultural variables have the sign that was often found before in the literature. For example, IDV is positive and increases risk (Ashraf et al., 2016; Bussoli, 2017; Mourouzidou-Damtsa et al., 2019) and PDI is negative (Ashraf et al., 2016; Kreiser et al., 2010). The only exception is UAI in table 2 which has the positive sign found by Illiashenko and Laidroo (2020). Since the corporate variables do not appear to have a mediation effect as they are often insignificant in equation 2 and the effects are insignificant as well, they seem to not be the cause of a mediation. However, the signs are still consistent with Illiashenko and Laidroo (2020). It is possible that one of the controls has a mediation effect and causes the change in signs. It is also possible that there is not enough variation in the cultural variables in contrast to other studies, for example the difference between the 75th percentile and the 25th percentile is only 15 in this study while it was 47 in the paper from Li et al. (2013). This could cause the results from being different than those found in other papers.

TABLE 2: MEDIATION ANALYSIS WITH SDROA AND BVD

	(1) sdROA b/se	(2) sdROA b/se	(3) sdROA b/se	(4) sdROA b/se	(5) sdROA b/se	(6) sdROA b/se
BVD	0.17 (0.23)	0.12 (0.21)	0.16 (0.23)	0.12 (0.21)	0.17 (0.23)	0.097 (0.22)
IDV	0.029 (0.06)	-0.11** (0.05)				
UAI			0.0023 (0.05)	0.072** (0.04)		
PDI					-0.025 (0.05)	0.089** (0.04)
Constant	0.19 (3.73)	-103.2*** (28.35)	1.83 (3.44)	-106.8*** (30.83)	3.24 (2.73)	-114.9*** (32.83)
var(u _{0j})	1.60*** (0.20)	1.12*** (0.24)	1.61*** (0.20)	1.17*** (0.24)	1.61*** (0.20)	1.14*** (0.25)
var(e _{ij})	1.07*** (0.06)	0.91*** (0.07)	1.07*** (0.06)	0.91*** (0.07)	1.07*** (0.06)	0.91*** (0.07)
Observations	168	168	168	168	168	168
Controls	No	Yes	No	Yes	No	Yes
Log lik	-451.3	-413.5	-451.6	-414.5	-451.5	-414.2
Intraclass cor	0.744	0.605	0.748	0.627	0.746	0.613
indeff	-0.0020 (0.00)	-0.0000 (0.00)	0.0016 (0.00)	0.0005 (0.00)	0.0031 (0.01)	0.0015 (0.00)
direff	0.029 (0.02)	-0.11 (0.09)	0.0023 (0.02)	0.072 (0.06)	-0.025 (0.04)	0.089 (0.07)
toteff	0.027 (0.02)	-0.11 (0.09)	0.0039 (0.02)	0.073 (0.06)	-0.022 (0.04)	0.090 (0.07)

Statistical analysis for the proxy revised BVD Independence Indicator from BankFocus Orbis. It is a multilevel analysis combined with a mediation effect, done with the ml_mediation command. The control variables were excluded from the table. Indeff is the indirect effect, direff is the direct effect and toteff the total effect. Their significance level was calculated with a bootstrap of 476 repetitions, respectively 500 for the models 1, 3 and 5. One star indicates a significance at the 10 percent level, two stars a significance at the 5 percent level and three indicates a significance at the 1 percent level. The numbers are shortened to the fourth decimal.

4.3. Analysis with the z-score

Table 3 presents the results when the z-score is used as a proxy for risk-taking. Anti-director rights are insignificant in every model. IDV is insignificant, not only in equation 3, but also in equation 1 and 2 in both model 1 and 2. The same applies for UAI. Both are negative, they seem to increase risk-taking. PDI is the only cultural variable that is significant, however it was not significant in equation 1 and 2 in model 6, it only becomes significant after anti-director rights is added to the analysis. In model 5, PDI was significant in equation 1 as well. It is negative, PDI increases risk-taking, and it supports hypothesis 3b. Since Illiashenko and Laidroo (2020) found that UAI can be dominated by other effects, it still supports hypothesis 2b. However, no support for hypothesis 1b can be found. It is consistent with the results from Kreiser et al. (2010), who also find that IDV is insignificant. IDV is the only cultural variable that changes its sign when the controls are excluded.

As before a complete table can be found in the appendix. Not many control variables are significant. Having skilled and older board members increases risk. This contradicts Srivastav and Hagendorff (2016), however as stated above that could be caused by over-confidence (Ashraf et al., 2016). Logarithm of GDP is positive, richer countries take less risk which is consistent with Kreiser et al. (2010).

The intraclass correlation is very low in the models 2 and 4. It is higher in the other models, but it is still low. Not much of the variation can be explained on the country-level. The log likelihood is around -470. The indirect effect is positive in every model, except for model 5, it decreases risk-taking through the other variables. The direct effect is stronger and negative, it offsets the indirect effect, so that the total effect is negative as well. Only in model 1 are all effects positive. In model 5, direct and total effects are significant. An increase in PDI decreases the z-score by -0.043, while the total effect decreases the z-score by -0.043.

TABLE 3: MEDIATION ANALYSIS WITH Z-SCORE AND ANTI-DIRECTOR-RIGHTS

(1)	(2)	(3)	(4)	(5)	(6)
zscore	zscore	zscore	zscore	zscore	zscore
b/se	b/se	b/se	b/se	b/se	b/se

Anti-director rights	-0.41 (0.52)	0.069 (0.42)	-0.63 (0.54)	0.068 (0.47)	-0.51 (0.48)	-0.070 (0.44)
IDV	0.013 (0.03)	-0.012 (0.03)				
UAI			-0.023 (0.02)	-0.0016 (0.02)		
PDI					-0.043** (0.02)	-0.047* (0.03)
Constant	4.20 (2.76)	-47.2** (21.26)	7.30*** (2.73)	-43.7* (24.60)	7.41*** (1.99)	-12.3 (27.87)
var(u_0j)	0.37 (0.44)	-17.6*** (4.17)	0.32 (0.45)	-13.6 (2445.59)	0.18 (0.47)	-0.86 (2.86)
var(e_ij)	1.46*** (0.06)	1.45*** (0.06)	1.46*** (0.06)	1.45*** (0.06)	1.46*** (0.06)	1.44*** (0.06)
Observations	168	168	168	168	168	168
Controls	No	Yes	No	Yes	No	Yes
Log lik	-490.7	-471.9	-490.6	-472.3	-489.2	-470.8
Intraclass cor	0.101	0.0000	0.0926	0.0000	0.0725	0.010
indeff	0.0015 (0.01)	0.0005 (0.03)	0.0090 (0.01)	0.0009 (0.02)	-0.0002 (0.01)	0.0016 (0.02)
direff	0.013 (0.02)	-0.012 (0.05)	-0.023 (0.02)	-0.0016 (0.03)	-0.043* (0.02)	-0.047 (0.04)
toteff	0.014 (0.02)	-0.012 (0.06)	-0.014 (0.02)	-0.0007 (0.03)	-0.043** (0.02)	-0.045 (0.05)

Statistical analysis for the proxy revised anti-director rights from Djankov et al. (2008). It is a multilevel analysis combined with a mediation effect, done with the ml_mediation command. The control variables were excluded from the table. Indeff is the indirect effect, direff is the direct effect and toteff the total effect. Their significance level was calculated with a bootstrap of 476 repetitions, respectively 500 for the models 1, 3 and 5. One star indicates a significance at the 10 percent level, two stars a significance at the 5 percent level and three indicates a significance at the 1 percent level. The numbers are shortened to the fourth decimal.

The BVD is insignificant in all six models. IDV is insignificant in each of the three equations, PDI is however significant in equation 2, there is a positive relationship between the two. Also, PDI is significant in equation 1 and 2 when no control variables are included and but turns insignificant in equation 3. At least without control variables does BVD have a mitigating effect on PDI. In model 4, UAI is insignificant in each equation, but in model 3 it is significant and positive in equation 2. All three cultural variables are negative, they increase risk-taking. Only hypothesis 2b can be supported, while no evidence can be found for the other two hypotheses. As in table 3, IDV is the only cultural variable that changes its sign when the controls are included. Kreiser et al. (2010) find too that IDV is insignificant, and other papers find UAI and PDI to be insignificant before as well (Breuer et al., 2014).

As in table 3, not many control variables are significant. Having a higher percentage of women on board is significant in model 4 and 6. It has a positive effect on the z-score. Skills is also only significant in model 4 and 6 and it is negative. Average age is negative as well and significant at the 10% level in all three models. That the latter two variables lead to higher risk-

taking could be caused by overconfidence (Ashraf et al., 2016). The logarithm of GDP is only significant in model 2 and 4 and it is positive and is consistent with Kreiser et al. (2010).

The intraclass correlation is very low in each of the models, while log likelihood is again around -470. The indirect effect is positive for IDV, while it is negative for model 4 and 6. The direct effect is negative, all three cultural variables decrease the z-score. Since the direct effect is larger than the indirect effect, the total effect is negative as well, even though it is offset a bit by the indirect effect in model 2.

For the models without controls, some effects are significant. The indirect effect in model 1 is significant and positive, while in model 3 only the indirect effect is negative and significant. In model 5, the indirect and total effect are significant and negative as well. Without controls, there appears to be a mediation effect, especially in the model 5. In this model, PDI turns insignificant after BVD is included. The significant indirect and total effect could indicate that BVD has a mitigating effect on PDI. In model 3, only equation 2 is significant, but still the significant indirect effect could indicate a mitigation effect there as well. In model 1, none of the equations were significant which makes it harder to determine if there is a mitigation effect.

Overall, no support for hypothesis 1b can be found, it is insignificant and is consistent with the results from Kreiser et al. (2010). Hypothesis 2b holds as UAI is insignificant as theorized by Illiashenko and Laidroo (2020). Hypothesis 3b holds when anti-director rights are used, however a mitigation effect can be found in table 4.

TABLE 4: MEDIATION ANALYSIS WITH Z-SCORE AND BVD

	(1)	(2)	(3)	(4)	(5)	(6)
	zscore	zscore	zscore	zscore	zscore	zscore
	b/se	b/se	b/se	b/se	b/se	b/se
BVD	-0.45 (0.31)	-0.43 (0.34)	-0.44 (0.32)	-0.43 (0.34)	-0.34 (0.32)	-0.33 (0.35)
IDV	0.0077 (0.03)	-0.013 (0.03)				
UAI			-0.0097 (0.02)	-0.0013 (0.02)		
PDI					-0.035 (0.02)	-0.039 (0.03)
Constant	4.34* (2.28)	-39.6* (21.99)	5.44*** (1.57)	-36.3 (24.04)	6.24*** (1.25)	-12.5 (27.08)
var(u _{0j})	0.24 (0.53)	-22.2*** (4.33)	0.27 (0.49)	-21.3*** (4.61)	0.19 (0.48)	-10.8** (5.18)
var(e _{ij})	1.46*** (0.06)	1.44*** (0.06)	1.46*** (0.06)	1.45*** (0.06)	1.46*** (0.06)	1.44*** (0.06)
Observations	168	168	168	168	168	168
Controls	No	Yes	No	Yes	No	Yes
Log lik	-490.5	-471.3	-490.9	-471.9	-489.7	-470.6
Intraclass cor	0.0794	0.0000	0.0844	0.0000	0.0726	0.0000
indeff	0.0054*	0.0000	-0.0042*	-0.0018	-0.0060*	-0.0052

	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
direff	0.0077	-0.013	-0.0097	-0.0013	-0.035	-0.039
	(0.02)	(0.05)	(0.02)	(0.02)	(0.02)	(0.04)
toteff	0.013	-0.013	-0.014	-0.0031	-0.041*	-0.044
	(0.02)	(0.05)	(0.02)	(0.02)	(0.02)	(0.04)

Statistical analysis for the proxy BVD Independence Indicator from BankFocus Orbis. It is a multilevel analysis combined with a mediation effect, done with the ml_mediation command. The control variables were excluded from the table. Indeff is the indirect effect, direff is the direct effect and toteff the total effect. Their significance level was calculated with a bootstrap of 476 repetitions, respectively 500 for the models 1, 3 and 5. One star indicates a significance at the 10 percent level, two stars a significance at the 5 percent level and three indicates a significance at the 1 percent level. The numbers are shortened to the fourth decimal.

4.4. Robustness Check

Li et al. (2013) used a different approach to analyse the mediation effect. They conducted a multilevel analysis with all the control variables and used calculations to find the direct, indirect, and total effects. I replicated their method for the six models including the standard deviation of returns on assets.

All the cultural variables are significant. IDV is negative in the models 1 and 4, it decreases risk-taking and is consistent with hypothesis 1a. UAI and PDI are both positive and therefore increase risk-taking and supports hypothesis 2a and 3a as well. While BVD is insignificant, anti-director rights are significant in model 4 and 6. Higher anti-director rights lead to less risk-taking. This contradicts John et al. (2008) and Paligorova (2011) who found that it increases risk-taking.

TABLE 5: ROBUSTNESS CHECK MULTILEVEL ANALYSIS

	(1) sdROA b/se	(2) sdROA b/se	(3) sdROA b/se	(4) sdROA b/se	(5) sdROA b/se	(6) sdROA b/se
IDV	-0.11*** (0.04)			-0.12*** (0.04)		
UAI		0.061** (0.03)			0.054* (0.03)	
PDI			0.093** (0.04)			0.091** (0.04)
BVD	0.11 (0.19)	0.098 (0.20)	0.083 (0.20)			
Anti-director rights				-1.45** (0.61)	-0.98 (0.67)	-1.13* (0.64)
Constant	-87.5*** (25.43)	-79.4*** (27.45)	-97.1*** (30.20)	-81.1*** (23.75)	-68.3** (27.50)	-88.4*** (29.25)
var(u_0j)	-25.6 (.)	-24.7 (.)	-19.2 (.)	-23.1 (.)	-24.1 (.)	-28.2 (.)
var(e_ij)	-0.46 (.)	-0.40 (.)	-0.42 (.)	-0.55 (.)	-0.43 (.)	-0.49 (.)
var(u_1j)	-29.6	-31.5	-21.3	-23.5	-24.2	-29.2

	(.)	(.)	(.)	(.)	(.)	(.)
Observations	168	168	168	168	168	168
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Log lik	-400.2	-402.1	-401.3	-397.7	-401.2	-399.9
Intraclass cor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Statistical multilevel analysis for the proxy BVD Independence Indicator from BankFocus Orbis and anti-director rights from Djankov et al. (2008). It is a multilevel analysis done with the mixed command. The dummy adjustments variables were excluded from the table. One star indicates a significance at the 10 percent level, two stars a significance at the 5 percent level and three indicates a significance at the 1 percent level. The numbers are shortened to the fourth decimal.

This step only shows the direct effect of culture on risk-taking. To find the other effects as well, the next step is to conduct mixed analyses with random coefficients with the cultural variables as controls and the corporate governance and control variables as dependent variables. The goal is to find the variables through which culture indirectly influences bank risk-taking which are important to find the effects. The table only includes the coefficients for BVD and the anti-director rights, the rest of the table can be found in the appendix.

IDV is significantly positively related to anti-director rights and capital structure and has a negative relationship with funding structure. The relation between IDV and anti-director rights is as predicted by Griffin et al. (2017) and Licht et al. (2005). UAI is significantly positively related to inflation and the prompt corrective action. It has a negative relation with anti-director rights which supports Kwok and Tadesse (2006), who stated that high uncertainty avoiding countries tend to have bank-based system with less investor protection. PDI has a positive relation with BVD, Anti-director rights and inflation. The sign is as expected for anti-director rights (Licht et al., 2005), but a negative sign had been expected for BVD (Holderness, 2017).

TABLE 6: MIXED MODELS WITH CULTURAL VARIABLES AS CONTROL

	(1) BVD b/se	(2) Anti-director rights b/se
IDV	0.001 (0.01)	0.0095** (0.00)
UAI	0.0004 (0.01)	-0.027*** (0.01)
PDI	0.018*** (0.01)	0.025*** (0.01)
Constant	1.53** (0.69)	0.65** (0.32)
Observations	168	168
Log lik	-247.6	9145.1

Multilevel analysis where the three cultural variables individuality, uncertainty avoidance and power distance are used as controls. N stands for the number of observations. One star indicates a significance at the 10 percent level, two stars a significance at the 5 percent level and three indicates a significance at the 1 percent level. The numbers are shortened to the fourth decimal.

The last step consists of the calculations. Table 7 presents the indirect, direct, and total effects. First, the 75th and 25th percentile for each of the cultural variable needs to be found, then I calculate the change in the cultural variables from the 25th to the 75th percentile. For example, for IDV that is $0.75-0.6=0.15$, for UAI it is $0.86-0.53=0.33$, for PDI it is $0.68-0.35=0.033$. Row 1 shows the results from table 6. Row 2 multiplies the number from row 1 with the respective change in the cultural variables. Row 3 shows the coefficient of table 5 and finally row 4 is the multiplication of row 2 and 3. To keep the table more concisely only the values for BVD and Anti-director rights are included, the complete tables can be found in the appendix. The calculations were done separately for BVD and Anti-director rights.

The sum of all the results in row 4 is the indirect effect. For IDV it is around -0.004 in the column BVD, standard deviation gets slightly decreased through the country and firm variables. This is slightly higher than it was in table 2. The direct effect is negative as well and is calculated with the coefficient from IDV in table 5 times the change in IDV calculated above. When IDV increases from the 25th to the 75th percentile, the standard deviation will decrease by -0.0165. This is slightly lower than it was in table 6. The total effect is the sum of direct and indirect effect. It decreases standard deviation, which supports hypothesis 1a. It is slightly lower than the one found in table 2, however they do have the same sign. All three effects are positive for UAI while indirect effect was negative in table 2, the other two effects have the same sign as before. Both indirect effects are rather small, the different signs can be just randomly. As the total effect is positive, it increases risk and supports hypothesis 2a. For PDI, all three effects are positive as well. They have the same sign as in table 2, however they are again slightly lower as in the latter but still, they are in support of hypothesis 3a.

The column 2 shows the results when the Anti-director rights are used instead of the independence indicator. IDV has the same signs as in table 1 and again the results are slightly lower, however total effects still supports hypothesis 1a. For UAI, all effects are positive, again supporting hypothesis 2a. However, indirect effect has a different sign as in table 1 where it was negative. Both are however rather small just as in column 1. For PDI, indirect effect is negative, while it is positive in table 1 and table 7. With -0.004 the effect is small, its impact on total effects is minimal. The other two effects are positive and have the same sign as before. Since the total effect is positive, hypothesis 3a is supported.

Unfortunately, Li et al. (2013) did not offer any tests to control for the significance of the effects, there is no possibility to check if they are significant. However, anti-director rights for all cultural variables and BVD for PDI are significant, since they are related to the indirect effects, this could indicate that they are significant as well. While some significance levels in

table 5 and some signs in the tables 7 and 8 are different than the ones found before, overall, the robustness check supports the results found by the mediation analysis done in table 1 and 2.

TABLE 7: INDIRECT, DIRECT, AND TOTAL EFFECTS FOR BVD

	(1) BVD	(2) Anti-director rights
IDV		
(1)	0.001	0.0095
(2)	0.0001	0.0001
(3)	0.113	-1.451
(4)	0.0000	-0.0021
Indirect Effect	-0.0042	-0.0054
Direct Effect	-0.0165	-0.0186
Total Effect	-0.0207	-0.024
UAI		
(1)	0.0004	-0.0272
(2)	0.0001	-0.009
(3)	0.0983	-0.977
(4)	0.0000	0.0088
Indirect Effect	0.0094	0.0159
Direct Effect	0.0201	0.0177
Total Effect	0.0295	0.0335
PDI		
(1)	0.0178	0.0246
(2)	0.0059	0.0081
(3)	0.0829	-1.128
(4)	0.0005	-0.0092
Indirect Effect	0.0023	-0.0044
Direct Effect	0.0307	0.0301
Total Effect	0.033	0.0257

Row 1 shows the results from table 6. Row 2 multiplies the number from row 1 with the respective change in the cultural variables. Row 3 shows the coefficient of table 5 and finally row 4 is the multiplication of row 2 and 3. The sum of all the results in row 4 is the indirect effect. The direct effect is calculated with the coefficient from the respective cultural variable in table 5 times the change in the cultural variable. The total effect is the sum of the direct and indirect effect. All the numbers are shortened to fourth deciles after the comma. The tables 21 and 22 in the appendix include the control variables as well.

5. Conclusion

The aim of this paper is to investigate the relationships between culture, corporate governance and bank-risk taking and to find out if corporate governance mitigates the relationship between culture and risk-taking. While all these factors had been analysed quite often, it is rare to combine these three in one paper. To my knowledge that had only been done twice before, by Illiashenko and Laidroo (2020) and Li et al. (2013). Both find different results from each other, with the former discovering a cushioning effect where the inclusion of corporate governance turns the effect of individualism negative and turning uncertainty avoidance insignificant, while

the latter find that individualism has a positive, and uncertainty avoidance has a negative effect which get mitigated or enforced by corporate governance.

This paper uses data from 28 countries and includes 168 banks. The mediation analysis conducted with multilevel data shows that, using the standard deviation of return on assets, the cultural variables have the sign predicted by the hypotheses and the results are similar to those found by Illiashenko and Laidroo (2020). The corporate governance variables and the effects are insignificant, however, in one case the inclusion of corporate governance turns uncertainty avoidance insignificant, while in other cases its inclusion does not change much, while for PDI the coefficient and significance decreased slightly after adding corporate governance. There appears to be a slight, but rather weak mitigation effect which weakens the significance level. As for the z-score, the majority of the cultural variables are insignificant. However, they had been significant before the corporate governance variables had been included and they have often a significant impact on culture. It appears that corporate governance has a mitigating effect on culture and decreases the significance level of the culture variables. Depending on which proxy is chosen for risk-taking, the effect of corporate governance on culture differs, often weakening its impact on risk-taking.

The results show that when looking at standard deviation of return on assets, culture usually has a large impact on risk-taking. Individualism decreases risk-taking, that could be due to cushioning, where individualism encourages risk enforcing practices (Illiashenko & Laidroo, 2020). Uncertainty avoidance is positive and sometimes insignificant, it is likely dominated by individualism (Illiashenko & Laidroo, 2020). Power distance is positive. In lower power distance countries, managers often consult their employees and groups are known to be more risk-averse than individuals (Ashraf et al., 2016; Kreiser et al., 2010) which could cause the positive relationship. For the z-score, many cultural variables are insignificant. Still, there appears to be mitigation effect which changes the signs or weakens the significance of the cultural variables.

While the effect of culture gets mitigated and slightly weakened by corporate governance, policymakers need to be careful of the effect culture could have. A policy that works in a certain country may not have the desired effect in a country with a different culture. For example, better shareholder rights may lead to a lower standard deviation of return on assets in an individualistic country but may increase it in a country with a high power distance, depending on the sign of the indirect effect.

A weakness of this paper is the small dataset with only 168 banks. While the data is from 28 different countries, all of them are from Europe, except the US, and it is possible that there is

not enough cultural variation. For example, the difference in the 75th percentile and the 25th percentile from the robustness checks is much smaller in this paper than it was in Li et al. (2013). Future research could include more countries to control if the results are biased due to the small database and if there is enough cultural variation. As mentioned in the introduction, different proxies for corporate governance could lead to different results. Future research could check if the cushioning hypothesis also holds when other aspects of corporate governance are used, such as diversified owners or bank regulations (Laeven & Levine, 2009). Since the effects were often insignificant, it is possible that a control variable has a mitigating effect. Future research could further investigate this and check if a control variable is mitigating the effects. Some variables such as official supervision were dropped from the analysis due to multicollinearity and future research could control what their effect would be and if their inclusion would change the results. It would also be important to clarify if the cushioning hypothesis is unique to the banking sector or if it affects the risk-taking in other sectors as well, for example the risk-taking of insurance companies. It could also be useful to include multiple years in future research to make sure that it is not caused by an event in a certain year. Using panel data would also allow to use different methodological approaches, such as the `paramed` or `medeff` commands.

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7. Appendix

TABLE 8: DESCRIPTION OF THE VARIABLES

Variables	Description	Source
sdROA	Standard deviation of return on assets.	Eikon
z-score	Return on asset plus stockholder's equity divided by total assets. Total divided by standard deviation of return on asset.	Eikon
IDV	The higher this score is, the more individualistic a country is.	Hofstede Insights
UAI	The higher the score is, the higher is the uncertainty avoidance in a country.	Hofstede Insights
PDI	The higher the score is, the higher is the power distance in a country.	Hofstede Insights
Anti-director rights	A higher anti-director right index indicates better shareholder rights.	Djankov et al. (2008).
BVD	Bureau van Dijk Independence Indicator measures shareholder concentration. Ranges from 0 to 4. With 0 being unknown and 4 corresponding to a direct owner with over 50%	Bank Focus Orbis
lassets	Logarithm of total assets, which is expressed in thousands	Eikon
Funding structure	Ratio of deposits to total assets	Eikon
Capital structure	Ratio of equity to total assets	Eikon
Loan loss	Measures the loan loss provision a bank holds expressed in percentages	Eikon
HHI	The Herfindahl-Hirschmann Index measures how diversified the income of a bank is	Eikon
Women on board	The percentage of female board members	Eikon
Female managers	The percentage of female managers	Eikon
% with skills	The percentage of board members with previous education or experience in finance	Eikon
Average age of board	Average age of board members	BoardEX
State	Dummy variable which is one if the state holds at least 50% of the votes and zero if otherwise	Eikon
CEOONBOARD	Dummy variable which is one if the CEO is a board member and zero otherwise	Eikon
IGDP	Logarithm of GDP per capita, which is expressed in thousands	Eurostat
HICP	Inflation rate expressed in percentages	Eurostat
PCA	Prompt corrective action, the higher the score is, the faster does the state intervene	Barth et al. (2001)

TABLE 8: ADJUSTED SUMMARY STATISTICS

	count	mean	sd	min	max
zscore	168	3.7398	4.4738	-1.8701	30.7522
lzscore	161	.849	1.1507	-3.5418	3.426
sdROA	168	1.6658	3.7081	.0354	31.6673
UAI	168	67.9405	22.0404	23	99
IDV	168	66.6905	12.9564	27	91

PDI	168	48.6191	20.0439	11	100
Antidirector	168	3.1036	.8812	1	5
IGDP	168	10.3914	.2284	9.7111	11.3022
HICP	168	1.4238	.7264	.3	3.9
PCA	168	4.3987	1.269	1	6
lassets	168	16.4291	2.1523	11.8926	21.4933
Fundingstructure	168	60.2131	21.7936	0	97.04
capitalstructure	168	.2049	.2195	0	.89
loanloss	168	1.0617	4.6353	-4.26	55.91
hhi	168	.5875	.0914	.5	.9944
fboard	168	30.0245	9.3907	0	50
fmanager	168	37.4725	7.8135	6.44	68
skill	168	32.9469	13.0498	0	85.71
Age	168	49.0506	12.1795	0	75
State	168	.0357	.1861	0	1
CEOONBOARD	168	.25	.4343	0	1
ISOCODE	168	13.4583	7.2738	1	29
<i>N</i>	168				

The Numbers for zscore and assets is similar to those by Di Tommaso and Thornton (2020). Shortened to the fourth digit.

TABLE 9: CORRELATION

	(1)	(2)
	zscore	sdROA
UAI	-0.05	0.01
IDV	0.01	0.10
PDI	-0.14	-0.02
Antidirector	-0.07	-0.15
BVD	-0.13	0.04
IGDP	0.11	0.22**
HICP	0.04	0.05
IEF	0.07	0.09
PCA	-0.11	0.08
lassets	0.12	-0.35***
fundingstructuredum	-0.16*	0.52***
Fundingstructure	-0.20**	0.03
capitaldum	-0.13	0.07
capitalstructure	-0.01	0.12

loandum	-0.09	0.40***
loanloss	-0.06	0.08
HHIdum	-0.05	0.42***
hhi	0.03	0.08
fboarddum	-0.02	-0.05
fboard	0.17*	-0.28***
fmanagerdum	-0.15	0.15
fmanager	0.02	0.00
skilldum	-0.03	-0.06
skill	-0.14	-0.09
agedum	-0.01	0.17*
Age	-0.09	0.08
State	-0.11	-0.03
CEOONBOARD	-0.12	0.05
<i>N</i>	168	168

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

TABLE 10: ANALYSIS SDROA AND ANTI-DIRECTOR RIGHTS

	(1) sdROA b/se	(2) sdROA b/se	(3) sdROA b/se	(4) sdROA b/se	(5) sdROA b/se	(6) sdROA b/se
Anti-director rights	-2.09** (1.00)	-1.25* (0.69)	-2.32** (1.05)	-0.88 (0.85)	-2.12** (1.00)	-1.11 (0.73)
IDV	0.020 (0.05)	-0.11** (0.05)				
UAI			-0.029 (0.05)	0.054 (0.04)		
PDI					-0.022 (0.05)	0.078* (0.04)
log of total assets		-0.60*** (0.17)		-0.61*** (0.17)		-0.61*** (0.17)
fundingstructuredum=0		0 (.)		0 (.)		0 (.)
fundingstructuredum=1		3.49*** (0.94)		3.44*** (0.94)		3.40*** (0.94)
Funding Structure		-0.012 (0.01)		-0.011 (0.01)		-0.011 (0.01)
capitaldum=0		0 (.)		0 (.)		0 (.)
capitaldum=1		-0.18 (0.78)		-0.14 (0.79)		-0.11 (0.79)
Capital Structure		-0.41 (1.09)		-0.52 (1.09)		-0.51 (1.09)
loandum=0		0 (.)		0 (.)		0 (.)
loandum=1		-0.62 (0.86)		-0.64 (0.87)		-0.60 (0.87)
Loan loss provision		0.014 (0.04)		0.013 (0.04)		0.013 (0.04)
HHIdum=0		0 (.)		0 (.)		0 (.)
HHIdum=1		0.42 (0.89)		0.34 (0.89)		0.31 (0.89)
HHI		0.13 (2.56)		-0.18 (2.56)		-0.24 (2.57)
fboarddum=0		0 (.)		0 (.)		0 (.)
fboarddum=1		-0.78 (1.26)		-0.60 (1.27)		-0.65 (1.27)
women on board %		-0.020 (0.03)		-0.015 (0.03)		-0.018 (0.03)
fmanagerdum=0		0 (.)		0 (.)		0 (.)
fmanagerdum=1		-0.18 (0.71)		-0.16 (0.71)		-0.20 (0.71)
female managers %		-0.0051 (0.03)		-0.0044 (0.03)		-0.0031 (0.03)
skilldum=0		0 (.)		0 (.)		0 (.)
skilldum=1		0.25 (1.06)		0.12 (1.06)		0.16 (1.06)

% with skills (industry/finance)		-0.0050		-0.0089		-0.0096
		(0.02)		(0.02)		(0.02)
agedum=0		0		0		0
		(.)		(.)		(.)
agedum=1		-0.79		-0.71		-0.73
		(0.52)		(0.52)		(0.52)
average age of board		0.036*		0.035*		0.036*
		(0.02)		(0.02)		(0.02)
State owned=0		0		0		0
		(.)		(.)		(.)
State owned=1		-0.42		-0.34		-0.40
		(1.27)		(1.28)		(1.28)
CEO on board=0		0		0		0
		(.)		(.)		(.)
CEO on board=1		0.43		0.39		0.36
		(0.81)		(0.82)		(0.82)
log of GDP		10.4***		9.50***		10.5***
		(2.73)		(3.03)		(3.07)
HICP in %		1.83**		1.62*		1.22
		(0.90)		(0.97)		(0.94)
PCA		0.69		0.42		0.45
		(0.52)		(0.55)		(0.53)
Constant	7.77	-91.1***	11.8**	-91.1***	10.2**	-100.7***
	(4.84)	(28.18)	(5.40)	(34.62)	(4.08)	(34.08)
var(u_0j)	1.54***	1.10***	1.54***	1.20***	1.54***	1.15***
	(0.20)	(0.23)	(0.20)	(0.23)	(0.20)	(0.24)
var(e_ij)	1.07***	0.90***	1.06***	0.90***	1.06***	0.90***
	(0.06)	(0.07)	(0.06)	(0.07)	(0.06)	(0.07)
Observations	168	168	168	168	168	168
Log lik	-448.0	-410.8	-448.0	-412.7	-448.1	-412.0
Intraclass cor	0.722	0.596	0.722	0.644	0.723	0.619
indeff	0.0074	-0.0089	0.033	-0.012	-0.0008	0.025
	(0.04)	(0.11)	(0.04)	(0.04)	(0.03)	(0.05)
direff	0.020	-0.11	-0.029	0.054	-0.022	0.078
	(0.05)	(0.09)	(0.04)	(0.05)	(0.04)	(0.06)
toteff	0.028	-0.12	0.0035	0.042	-0.023	0.10
	(0.02)	(0.14)	(0.02)	(0.06)	(0.04)	(0.08)

TABLE 12: BOOTSTRAPPING SDROA AND ANTI-DIRECTOR RIGHTS

	(1) IDV b/se	(2) IDV b/se	(3) UAI b/se	(4) UAI b/se	(5) PDI b/se	(6) PDI b/se
indeff	0.0074 (0.04)	-0.0089 (0.11)	0.033 (0.04)	-0.012 (0.04)	-0.0008 (0.03)	0.025 (0.05)
direff	0.020 (0.05)	-0.11 (0.09)	-0.029 (0.04)	0.054 (0.05)	-0.022 (0.04)	0.078 (0.06)
toteff	0.028 (0.02)	-0.12 (0.14)	0.0035 (0.02)	0.042 (0.06)	-0.023 (0.04)	0.10 (0.08)
Controls	No	Yes	No	Yes	No	Yes
Observations	168	168	168	168	168	168
Replications	500	476	500	476	500	476

TABLE 13: ANALYSIS SDROA AND BVD

	(1) sdROA b/se	(2) sdROA b/se	(3) sdROA b/se	(4) sdROA b/se	(5) sdROA b/se	(6) sdROA b/se
BVD	0.17 (0.23)	0.12 (0.21)	0.16 (0.23)	0.12 (0.21)	0.17 (0.23)	0.097 (0.22)
IDV	0.029 (0.06)	-0.11** (0.05)				
UAI			0.0023 (0.05)	0.072** (0.04)		
PDI					-0.025 (0.05)	0.089** (0.04)
log of total assets		-0.58*** (0.17)		-0.59*** (0.17)		-0.60*** (0.17)
fundingstructuredum=0		0 (.)		0 (.)		0 (.)
fundingstructuredum=1		3.60*** (0.95)		3.51*** (0.95)		3.48*** (0.95)
Funding Structure		-0.012 (0.01)		-0.010 (0.01)		-0.010 (0.01)
capitaldum=0		0 (.)		0 (.)		0 (.)
capitaldum=1		-0.14 (0.80)		-0.093 (0.80)		-0.072 (0.80)
Capital Structure		-0.25 (1.11)		-0.42 (1.10)		-0.38 (1.11)
loandum=0		0 (.)		0 (.)		0 (.)
loandum=1		-0.67 (0.87)		-0.68 (0.87)		-0.63 (0.88)
Loan loss provision		0.013 (0.05)		0.012 (0.05)		0.013 (0.05)
HHIdum=0		0 (.)		0 (.)		0 (.)
HHIdum=1		0.38 (0.90)		0.28 (0.90)		0.27 (0.90)
HHI		0.097 (2.58)		-0.25 (2.58)		-0.29 (2.59)
fboarddum=0		0 (.)		0 (.)		0 (.)
fboarddum=1		-0.68 (1.30)		-0.49 (1.30)		-0.58 (1.30)
women on board %		-0.025 (0.03)		-0.019 (0.03)		-0.023 (0.03)
fmanagerdum=0		0 (.)		0 (.)		0 (.)
fmanagerdum=1		-0.27 (0.72)		-0.22 (0.72)		-0.28 (0.72)
female managers %		-0.0035 (0.03)		-0.0042 (0.03)		-0.0018 (0.03)
skilldum=0		0 (.)		0 (.)		0 (.)
skilldum=1		0.21 (1.08)		0.056 (1.08)		0.13 (1.09)

% with skills (industry/finance)		-0.0065		-0.0099		-0.011
		(0.02)		(0.02)		(0.02)
agedum=0		0		0		0
		(.)		(.)		(.)
agedum=1		-0.74		-0.67		-0.69
		(0.52)		(0.52)		(0.52)
average age of board		0.036*		0.035*		0.036*
		(0.02)		(0.02)		(0.02)
State owned=0		0		0		0
		(.)		(.)		(.)
State owned=1		-0.76		-0.63		-0.69
		(1.34)		(1.34)		(1.34)
CEO on board=0		0		0		0
		(.)		(.)		(.)
CEO on board=1		0.32		0.34		0.26
		(0.82)		(0.82)		(0.83)
log of GDP		11.2***		10.6***		11.5***
		(2.78)		(2.80)		(3.01)
HICP in %		1.72*		1.56*		1.06
		(0.92)		(0.95)		(0.93)
PCA		0.77		0.46		0.51
		(0.53)		(0.54)		(0.53)
Constant	0.19	-103.2***	1.83	-106.8***	3.24	-114.9***
	(3.73)	(28.35)	(3.44)	(30.83)	(2.73)	(32.83)
var(u_0j)	1.60***	1.12***	1.61***	1.17***	1.61***	1.14***
	(0.20)	(0.24)	(0.20)	(0.24)	(0.20)	(0.25)
var(e_ij)	1.07***	0.91***	1.07***	0.91***	1.07***	0.91***
	(0.06)	(0.07)	(0.06)	(0.07)	(0.06)	(0.07)
Observations	168	168	168	168	168	168
Log lik	-451.3	-413.5	-451.6	-414.5	-451.5	-414.2
Intraclass cor	0.744	0.605	0.748	0.627	0.746	0.613
indeff	-0.0020	-0.0000	0.0016	0.0005	0.0031	0.0015
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
direff	0.029	-0.11	0.0023	0.072	-0.025	0.089
	(0.02)	(0.09)	(0.02)	(0.06)	(0.04)	(0.07)
toteff	0.027	-0.11	0.0039	0.073	-0.022	0.090
	(0.02)	(0.09)	(0.02)	(0.06)	(0.04)	(0.07)

TABLE 14: BOOTSTRAPPING SDROA AND BVD

	(1)	(2)	(3)	(4)	(5)	(6)
	IDV	IDV	UAI	UAI	PDI	PDI
	b/se	b/se	b/se	b/se	b/se	b/se
indeff	-0.0020	-0.0000	0.0016	0.0005	0.0031	0.0015
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
direff	0.029	-0.11	0.0023	0.072	-0.025	0.089
	(0.02)	(0.09)	(0.02)	(0.06)	(0.04)	(0.07)
toteff	0.027	-0.11	0.0039	0.073	-0.022	0.090
	(0.02)	(0.09)	(0.02)	(0.06)	(0.04)	(0.07)
Controls	No	Yes	No	Yes	No	Yes
Observations	168	168	168	168	168	168
Replications	500	476	500	476	500	476

TABLE 15: ANALYSIS Z-SCORE AND ANTI-DIRECTOR RIGHTS

	(1) zscore b/se	(2) zscore b/se	(3) zscore b/se	(4) zscore b/se	(5) zscore b/se	(6) zscore b/se
Anti-director rights	-0.41 (0.52)	0.069 (0.42)	-0.63 (0.54)	0.068 (0.47)	-0.51 (0.48)	-0.070 (0.44)
IDV	0.013 (0.03)	-0.012 (0.03)				
UAI			-0.023 (0.02)	-0.0016 (0.02)		
PDI					-0.043** (0.02)	-0.047* (0.03)
log of total assets		0.22 (0.26)		0.24 (0.27)		0.28 (0.26)
fundingstructuredum=0		0 (.)		0 (.)		0 (.)
fundingstructuredum=1		-1.61 (1.54)		-1.61 (1.56)		-1.12 (1.56)
Funding Structure		-0.019 (0.02)		-0.018 (0.02)		-0.025 (0.02)
capitaldum=0		0 (.)		0 (.)		0 (.)
capitaldum=1		-1.72 (1.30)		-1.73 (1.30)		-1.99 (1.30)
Capital Structure		2.67 (1.78)		2.59 (1.77)		2.27 (1.76)
loandum=0		0 (.)		0 (.)		0 (.)
loandum=1		-0.11 (1.42)		-0.12 (1.42)		-0.40 (1.42)
Loan loss provision		-0.051 (0.08)		-0.050 (0.08)		-0.056 (0.07)
HHIdum=0		0 (.)		0 (.)		0 (.)
HHIdum=1		0.43 (1.41)		0.41 (1.41)		0.55 (1.40)
HHI		4.30 (4.08)		4.18 (4.07)		4.27 (4.04)
fboarddum=0		0 (.)		0 (.)		0 (.)
fboarddum=1		1.83 (1.92)		1.93 (1.92)		2.21 (1.91)
women on board %		0.066 (0.04)		0.067 (0.04)		0.069 (0.04)
fmanagerdum=0		0 (.)		0 (.)		0 (.)
fmanagerdum=1		-2.70** (1.19)		-2.66** (1.19)		-2.44** (1.18)
female managers %		0.036 (0.05)		0.039 (0.05)		0.040 (0.05)
skilldum=0		0 (.)		0 (.)		0 (.)
skilldum=1		0.28 (1.68)		0.21 (1.67)		0.084 (1.66)

% with skills (industry/finance)		-0.051*		-0.054*		-0.051*
		(0.03)		(0.03)		(0.03)
agedum=0		0		0		0
		(.)		(.)		(.)
agedum=1		1.00		1.04		1.22
		(0.84)		(0.84)		(0.84)
average age of board		-0.053*		-0.053*		-0.058*
		(0.03)		(0.03)		(0.03)
State owned=0		0		0		0
		(.)		(.)		(.)
State owned=1		-2.63		-2.60		-2.24
		(2.02)		(2.02)		(2.01)
CEO on board=0		0		0		0
		(.)		(.)		(.)
CEO on board=1		-0.50		-0.48		-0.061
		(1.20)		(1.22)		(1.22)
log of GDP		4.74**		4.32*		1.42
		(2.06)		(2.24)		(2.57)
HICP in %		0.14		0.14		0.40
		(0.64)		(0.64)		(0.67)
PCA		-0.42		-0.44		-0.39
		(0.36)		(0.35)		(0.36)
Constant	4.20	-47.2**	7.30***	-43.7*	7.41***	-12.3
	(2.76)	(21.26)	(2.73)	(24.60)	(1.99)	(27.87)
var(u_0j)	0.37	-17.6***	0.32	-13.6	0.18	-0.86
	(0.44)	(4.17)	(0.45)	(2445.59)	(0.47)	(2.86)
var(e_ij)	1.46***	1.45***	1.46***	1.45***	1.46***	1.44***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Observations	168	168	168	168	168	168
Log lik	-490.7	-471.9	-490.6	-472.3	-489.2	-470.8
Intraclass cor	0.101	0.0000	0.0926	0.0000	0.0725	0.0100
indeff	0.0015	0.0005	0.0090	0.0009	-0.0002	0.0016
	(0.01)	(0.03)	(0.01)	(0.02)	(0.01)	(0.02)
direff	0.013	-0.012	-0.023	-0.0016	-0.043*	-0.047
	(0.02)	(0.05)	(0.02)	(0.03)	(0.02)	(0.04)
toteff	0.014	-0.012	-0.014	-0.0007	-0.043**	-0.045
	(0.02)	(0.06)	(0.02)	(0.03)	(0.02)	(0.05)

TABLE 16: BOOTSTRAPPING ANTI-DIRECTOR AND Z-SCORE

	(1)	(2)	(3)	(4)	(5)	(6)
	IDV	IDV	UAI	UAI	PDI	PDI
	b/se	b/se	b/se	b/se	b/se	b/se
indeff	0.0015	0.0005	0.0090	0.0009	-0.0002	0.0016
	(0.01)	(0.03)	(0.01)	(0.02)	(0.01)	(0.02)
direff	0.013	-0.012	-0.023	-0.0016	-0.043*	-0.047
	(0.02)	(0.05)	(0.02)	(0.03)	(0.02)	(0.04)
toteff	0.014	-0.012	-0.014	-0.0007	-0.043**	-0.045
	(0.02)	(0.06)	(0.02)	(0.03)	(0.02)	(0.05)
Controls	No	Yes	No	Yes	No	Yes
Observations	168	168	168	168	168	168
Replications	500	476	500	476	500	476

TABLE 17: ANALYSIS Z-SCORE AND BVD

	(1)	(2)	(3)	(4)	(5)	(6)
	zscore b/se	zscore b/se	zscore b/se	zscore b/se	zscore b/se	zscore b/se
BVD	-0.45 (0.31)	-0.43 (0.34)	-0.44 (0.32)	-0.43 (0.34)	-0.34 (0.32)	-0.33 (0.35)
IDV	0.0077 (0.03)	-0.013 (0.03)				
UAI			-0.0097 (0.02)	-0.0013 (0.02)		
PDI					-0.035 (0.02)	-0.039 (0.03)
log of total assets		0.20 (0.26)		0.21 (0.27)		0.27 (0.26)
fundingstructuredum=0		0 (.)		0 (.)		0 (.)
fundingstructuredum=1		-1.71 (1.54)		-1.72 (1.55)		-1.23 (1.56)
Funding Structure		-0.021 (0.02)		-0.020 (0.02)		-0.026 (0.02)
capitaldum=0		0 (.)		0 (.)		0 (.)
capitaldum=1		-1.90 (1.30)		-1.91 (1.30)		-2.10 (1.30)
Capital Structure		2.41 (1.78)		2.32 (1.76)		2.17 (1.75)
loandum=0		0 (.)		0 (.)		0 (.)
loandum=1		-0.026 (1.41)		-0.034 (1.41)		-0.32 (1.42)
Loan loss provision		-0.045 (0.08)		-0.044 (0.08)		-0.052 (0.07)
HHIdum=0		0 (.)		0 (.)		0 (.)
HHIdum=1		0.56 (1.41)		0.54 (1.41)		0.65 (1.40)
HHI		4.45 (4.02)		4.31 (4.03)		4.37 (3.97)
fboarddum=0		0 (.)		0 (.)		0 (.)
fboarddum=1		1.42 (1.94)		1.52 (1.93)		1.89 (1.93)
women on board %		0.070 (0.04)		0.071* (0.04)		0.073* (0.04)
fmanagerdum=0		0 (.)		0 (.)		0 (.)
fmanagerdum=1		-2.57** (1.18)		-2.52** (1.18)		-2.40** (1.17)
female managers %		0.033 (0.05)		0.037 (0.05)		0.040 (0.05)
skilldum=0		0 (.)		0 (.)		0 (.)
skilldum=1		0.59 (1.69)		0.51 (1.68)		0.36 (1.67)

% with skills (industry/finance)		-0.048		-0.051*		-0.050*
		(0.03)		(0.03)		(0.03)
agedum=0		0		0		0
		(.)		(.)		(.)
agedum=1		0.93		0.97		1.16
		(0.84)		(0.84)		(0.84)
average age of board		-0.054*		-0.054*		-0.059*
		(0.03)		(0.03)		(0.03)
State owned=0		0		0		0
		(.)		(.)		(.)
State owned=1		-1.78		-1.75		-1.70
		(2.12)		(2.12)		(2.10)
CEO on board=0		0		0		0
		(.)		(.)		(.)
CEO on board=1		-0.61		-0.60		-0.29
		(1.17)		(1.18)		(1.18)
log of GDP		4.15**		3.73*		1.46
		(2.10)		(2.21)		(2.51)
HICP in %		0.24		0.24		0.43
		(0.63)		(0.64)		(0.64)
PCA		-0.38		-0.40		-0.36
		(0.35)		(0.35)		(0.35)
Constant	4.34*	-39.6*	5.44***	-36.3	6.24***	-12.5
	(2.28)	(21.99)	(1.57)	(24.04)	(1.25)	(27.08)
var(u_0j)	0.24	-22.2***	0.27	-21.3***	0.19	-10.8**
	(0.53)	(4.33)	(0.49)	(4.61)	(0.48)	(5.18)
var(e_ij)	1.46***	1.44***	1.46***	1.45***	1.46***	1.44***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Observations	168	168	168	168	168	168
Log lik	-490.5	-471.3	-490.9	-471.9	-489.7	-470.6
Intraclass cor	0.0794	0.0000	0.0844	0.0000	0.0726	0.0000
indeff	0.0054*	0.0000	-0.0042*	-0.0018	-0.0060*	-0.0052
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
direff	0.0077	-0.013	-0.0097	-0.0013	-0.035	-0.039
	(0.02)	(0.05)	(0.02)	(0.02)	(0.02)	(0.04)
toteff	0.013	-0.013	-0.014	-0.0031	-0.041*	-0.044
	(0.02)	(0.05)	(0.02)	(0.02)	(0.02)	(0.04)

TABLE 18: BOOTSTRAPPING Z-SCORE AND BVD

	(1) IDV b/se	(2) IDV b/se	(3) UAI b/se	(4) UAI b/se	(5) PDI b/se	(6) PDI b/se
indeff	0.0054* (0.00)	0.0000 (0.00)	-0.0042* (0.00)	-0.0018 (0.00)	-0.0060* (0.00)	-0.0052 (0.01)
direff	0.0077 (0.02)	-0.013 (0.05)	-0.0097 (0.02)	-0.0013 (0.02)	-0.035 (0.02)	-0.039 (0.04)
toteff	0.013 (0.02)	-0.013 (0.05)	-0.014 (0.02)	-0.0031 (0.02)	-0.041* (0.02)	-0.044 (0.04)
Controls	No	Yes	No	Yes	No	Yes
Observations	168	168	168	168	168	168
Replications	500	476	500	476	500	476

TABLE 11: ROBUSTNESS CHECK

	(1) sdROA b/se	(2) sdROA b/se	(3) sdROA b/se	(4) sdROA b/se	(5) sdROA b/se	(6) sdROA b/se
IDV	-0.11*** (0.04)			-0.12*** (0.04)		
UAI		0.061** (0.03)			0.054* (0.03)	
PDI			0.093** (0.04)			0.091** (0.04)
BVD	0.11 (0.19)	0.098 (0.20)	0.083 (0.20)			
Anti-director rights				-1.45** (0.61)	-0.98 (0.67)	-1.13* (0.64)
log of total assets	-0.58*** (0.15)	-0.59*** (0.16)	-0.60*** (0.15)	-0.61*** (0.15)	-0.61*** (0.15)	-0.62*** (0.15)
Funding Structure	-0.011 (0.01)	-0.010 (0.01)	-0.010 (0.01)	-0.012 (0.01)	-0.011 (0.01)	-0.010 (0.01)
Capital Structure	-0.19 (1.01)	-0.49 (1.01)	-0.38 (1.01)	-0.39 (1.00)	-0.66 (1.01)	-0.56 (1.00)
Loan loss provision	0.013 (0.04)	0.012 (0.04)	0.012 (0.04)	0.014 (0.04)	0.013 (0.04)	0.013 (0.04)
HHI	0.032 (2.37)	-0.38 (2.38)	-0.39 (2.37)	0.032 (2.35)	-0.44 (2.37)	-0.47 (2.37)
women on board %	-0.022 (0.03)	-0.014 (0.03)	-0.018 (0.03)	-0.017 (0.03)	-0.011 (0.03)	-0.015 (0.03)
female managers %	-0.0017 (0.03)	0.0008 (0.03)	0.001 (0.03)	-0.0040 (0.03)	-0.0008 (0.03)	-0.0005 (0.03)
% with skills (industry/finance)	-0.0065 (0.02)	-0.010 (0.02)	-0.011 (0.02)	-0.0048 (0.02)	-0.010 (0.02)	-0.011 (0.02)
average age of board	0.035* (0.02)	0.035* (0.02)	0.036** (0.02)	0.035** (0.02)	0.035* (0.02)	0.036** (0.02)
State owned=1	-0.68 (1.23)	-0.54 (1.24)	-0.59 (1.24)	-0.34 (1.17)	-0.27 (1.19)	-0.33 (1.18)
CEO on board=1	0.31 (0.75)	0.42 (0.76)	0.31 (0.76)	0.47 (0.75)	0.51 (0.76)	0.43 (0.75)
log of GDP	9.77*** (2.52)	8.10*** (2.51)	9.80*** (2.78)	9.70*** (2.36)	7.41*** (2.47)	9.36*** (2.67)
HICP in %	1.03* (0.61)	0.83 (0.64)	0.43 (0.67)	1.56** (0.63)	1.22* (0.68)	0.86 (0.69)
PCA	0.80** (0.35)	0.41 (0.38)	0.56 (0.35)	0.62* (0.34)	0.31 (0.38)	0.40 (0.35)
Constant	-87.5*** (25.43)	-79.4*** (27.45)	-97.1*** (30.20)	-81.1*** (23.75)	-68.3** (27.50)	-88.4*** (29.25)
var(u_0j)	-25.6 (.)	-24.7 (.)	-19.2 (.)	-23.1 (.)	-24.1 (.)	-28.2 (.)
var(e_ij)	-0.46 (.)	-0.40 (.)	-0.42 (.)	-0.55 (.)	-0.43 (.)	-0.49 (.)
var(u_1j)	-29.6 (.)	-31.5 (.)	-21.3 (.)	-23.5 (.)	-24.2 (.)	-29.2 (.)
Observations	168	168	168	168	168	168
Log lik	-400.2	-402.1	-401.3	-397.7	-401.2	-399.9
Intraclass cor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

TABLE 12: MIXED MODELS WITH CULTURAL VARIABLES AS CONTROL

	(1) BVD	(2) Anti- director rights	(3) HICP in %	(4) PCA	(5) log of total assets	(6) Funding Structure	(7) Capital Structure	(8) Loan loss provision
	b/se	b/se	b/se	b/se	b/se	b/se	b/se	b/se
IDV	0.001 (0.01)	0.0095** (0.00)	-0.0012 (0.00)	-0.034 (0.04)	0.013 (0.02)	-0.41** (0.19)	0.0031** (0.00)	-0.0003 (0.03)
UAI	0.0004 (0.01)	-0.027*** (0.01)	0.0034** (0.00)	0.062*** (0.00)	0.010 (0.01)	-0.13 (0.15)	0.0007 (0.00)	0.0062 (0.02)
PDI	0.018*** (0.01)	0.025*** (0.01)	0.022*** (0.00)	-0.0027 (0.03)	-0.001 (0.01)	0.082 (0.15)	0.0014 (0.00)	-0.025 (0.03)
Constant	1.53** (0.69)	0.65** (0.32)	0.46** (0.22)	0.31 (0.66)	14.9*** (1.51)	94.9*** (19.77)	-0.12 (0.13)	1.89 (2.86)
N	168	168	168	168	168	168	168	168
Log lik	-247.6	9145.1	5109.8	9229.9	-365.4	-736.3	20.11	-494.8

TABLE 20 CONTINUATION

	(9) HHI	(10) women on board %	(11) female managers %	(12) % with skills	(13) average age of board	(14) State owned	(15) CEO on board
	b/se	b/se	b/se	b/se	b/se	b/se	b/se
IDV	0.0011 (0.00)	-0.089 (0.10)	-0.073 (0.07)	0.14 (0.12)	0.036 (0.11)	-0.0001 (0.00)	0.0062 (0.00)
UAI	0.0003 (0.00)	-0.094 (0.08)	-0.017 (0.06)	-0.087 (0.09)	-0.0001 (0.07)	-0.001 (0.00)	0.0023 (0.00)
PDI	0.0001 (0.00)	-0.058 (0.08)	0.039 (0.06)	0.11 (0.09)	-0.044 (0.08)	-0.0005 (0.00)	0.0006 (0.00)
Constant	0.49*** (0.07)	43.2*** (10.83)	42.4*** (7.20)	26.3** (12.01)	48.8*** (9.88)	0.13 (0.19)	-0.31 (0.50)
N	168	168	168	168	168	168	168
Log lik	170.2	-591.9	-564.3	-661.4	-652.5	49.28	-64.40

TABLE 13: INDIRECT, DIRECT, AND TOTAL EFFECTS FOR BVD

	BVD	HICP in %	PCA	log of total assets	Funding Structure	Capital Structure	Loan loss provision
IDV							
(1)	0.001	-0.0012	-0.0342	0.0134	-0.407	0.0031	-0.0003
(2)	0.0001	-0.0002	-0.0051	0.002	-0.0611	0.0005	-0.0000
(3)	0.113	1.03	0.8	-0.582	-0.011	-0.188	0.0127
(4)	0.0000	-0.0002	-0.0041	-0.0012	0.0007	-0.0001	-0.0000
Indirect Effect		-0.0042					
Direct Effect		-0.0165					
Total Effect		-0.0207					
UAI							
(1)	0.0004	0.0034	0.0624	0.0102	-0.129	0.0007	0.0062
(2)	0.0001	0.0011	0.0206	0.0034	-0.0426	0.0002	0.0021
(3)	0.0983	0.83	0.43	-0.587	-0.0104	-0.495	0.0118

(4)	0.0000	0.0009	0.0089	-0.002	0.0004	-0.0001	0.0000
Indirect Effect	0.0094						
Direct Effect	0.0201						
Total Effect	0.0295						
PDI							
(1)	0.0178	0.0216	-0.0027	-0.001	0.0824	0.0014	-0.0253
(2)	0.0059	0.0071	-0.0009	-0.0003	0.0272	0.0005	-0.0083
(3)	0.0829	0.43	0.56	-0.596	-0.01	-0.377	0.0124
(4)	0.0005	0.0031	-0.0005	0.0002	-0.0003	-0.0002	-0.0001
Indirect Effect	0.0023						
Direct Effect	0.0307						
Total Effect	0.033						

TABLE 21: CONTINUATION

	HHI	women on board %	female managers %	% with skills	average age of board	State owned	CEO on board
IDV							
(1)	0.0011	-0.0887	-0.0728	0.137	0.0357	-0.0001	0.0062
(2)	0.0002	-0.0133	-0.0109	0.0206	0.0054	-0.0000	0.0009
(3)	0.0321	-0.0215	-0.0017	-0.0065	0.0349	-0.677	0.314
(4)	0.0000	0.0003	0.0000	-0.0001	0.0002	0.0000	0.0003
UAI							
(1)	0.0003	-0.0942	-0.0173	-0.0868	-0.0001	-0.001	0.0023
(2)	0.0001	-0.0311	-0.0057	-0.0286	0.0000	-0.0003	0.0008
(3)	-0.379	-0.0141	0.0008	-0.0101	0.0351	-0.543	0.421
(4)	0.0000	0.0004	0.0000	0.0003	0.0000	0.0002	0.0003
PDI							
(1)	0.0001	-0.0585	0.0391	0.108	-0.0438	-0.0005	0.0006
(2)	0.0000	-0.0193	0.0129	0.0356	-0.0145	-0.0002	0.0002
(3)	-0.387	-0.0179	0.001	-0.0107	0.0357	-0.592	0.308
(4)	0.0000	0.0003	0.0000	-0.0004	-0.0005	0.0001	0.0001

Row 1 shows the results from table 6. Row 2 multiplies the number from row 1 with the respective change in the cultural variables. Row 3 shows the coefficient of table 5 and finally row 4 is the multiplication of row 2 and 3. The sum of all the results in row 4 is the indirect effect. The direct effect is calculated with the coefficient from the respective cultural variable in table 5 times the change in the cultural variable. The total effect is the sum of direct and indirect effect. All the numbers are shortened to seven deciles after the comma.

TABLE 14: INDIRECT, DIRECT, AND TOTAL EFFECTS FOR ANTI-DIRECTOR RIGHTS

	Anti- director rights	HICP in %	PCA	log of total assets	Funding Structure	Capital Structure	Loan loss provision
IDV							
(1)	0.0095	-0.0012	-0.0342	0.0134	-0.407	0.0031	-0.0003
(2)	0.0001	-0.0002	-0.0051	0.002	-0.0611	0.0005	0.0000
(3)	-1.451	1.557	0.615	-0.61	-0.0118	-0.388	0.014
(4)	-0.0021	-0.0003	-0.0032	-0.0012	0.0007	-0.0002	0.0000
Indirect Effect		-0.0054					
Direct Effect		-0.0186					
Total Effect		-0.024					
UAI							
(1)	-0.0272	0.0034	0.0624	0.0102	-0.129	0.0007	0.0062

(2)	-0.009	0.0012	0.0206	0.0034	-0.0426	0.0002	0.0021
(3)	-0.977	1.225	0.307	-0.605	-0.0108	-0.661	0.0132
(4)	0.0088	0.0014	0.0063	-0.002	0.0005	-0.0002	0.0000
Indirect Effect	0.0159						
Direct Effect	0.0177						
Total Effect	0.0335						
PDI							
(1)	0.0246	0.0216	-0.0027	-0.001	0.0824	0.0014	-0.0253
(2)	0.0081	0.0071	-0.0009	-0.0003	0.0272	0.0005	-0.0083
(3)	-1.128	0.855	0.402	-0.617	-0.0104	-0.565	0.0133
(4)	-0.0092	0.0061	-0.0004	0.0002	-0.0003	-0.0003	-0.0001
Indirect Effect	-0.0044						
Direct Effect	0.0301						
Total Effect	0.0257						

TABLE 22: CONTINUATION

	HHI	women on board %	female managers %	% with skills	average age of board	State owned	CEO on board
IDV							
(1)	0.0011	-0.0887	-0.0728	0.137	0.0357	-0.0001	0.0062
(2)	0.0002	-0.0133	-0.0109	0.0206	0.0054	0.0000	0.0009
(3)	0.0322	-0.0173	-0.004	-0.0048	0.0353	-0.336	0.474
(4)	0.0000	0.0002	0.0000	-0.0001	0.0002	0.0000	0.0004
UAI							
(1)	0.0003	-0.0942	-0.0173	-0.0868	-0.0001	-0.001	0.0023
(2)	0.0001	-0.0311	-0.0057	-0.0286	0.0000	-0.0003	0.0008
(3)	-0.438	-0.0114	-0.0008	-0.0101	0.0349	-0.266	0.514
(4)	0.0000	0.0004	0.0000	0.0003	0.0000	0.0001	0.0004
PDI							
(1)	0.0001	-0.0585	0.0391	0.108	-0.0438	-0.0005	0.0006
(2)	0.0000	-0.0193	0.0129	0.0356	-0.0145	-0.0002	0.0002
(3)	-0.467	-0.0148	-0.0005	-0.0106	0.0358	-0.33	0.432
(4)	0.0000	0.0003	0.0000	-0.0004	-0.0005	0.0001	0.0001

Row 1 shows the results from table 6. Row 2 multiplies the number from row 1 with the respective change in the cultural variables. Row 3 shows the coefficient of table 5 and finally row 4 is the multiplication of row 2 and 3. The sum of all the results in row 4 is the indirect effect. The direct effect is calculated with the coefficient from the respective cultural variable in table 5 times the change in the cultural variable. The total effect is the sum of direct and indirect effect. All the numbers are shortened to seven deciles after the comma.