



“Impact of auditor tenure on audit quality: European evidence”

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IMPACT OF AUDITOR TENURE ON AUDIT QUALITY: EUROPEAN EVIDENCE

Abstract

This study examines the relationship of auditor tenure and audit quality in four European countries, namely Germany, France, Italy and Spain, with the innovative GMM (Generalized Methods of Moments) model during the period from 2005 to 2013. Two GMM methods are used with two alternative definitions of crisis – the main and the robustness method. The results agree regardless of the fact that some of the control variables are excluded in the robustness test.

The results support the finding that in Spain, there is an impact of auditors' long-term tenure on discretionary accruals, affecting auditors' quality and independence indirectly. In addition, the crisis affected Germany and France as far as the change in negative and positive values of GDP is concerned. In this respect, the crisis affected the above two countries when the years before and after the crisis are considered as a robustness check. The results contain important implications for accountant regulators and policy makers.

Keywords

GMM, auditor tenure, audit quality, Eurozone, financial crisis

JEL Classification

M41, M42

INTRODUCTION

This paper examines the way in which the factors that are concerned with external audits behave in the light of the financial crisis, which had an impact on the global financial environment. Initially, the notions associated with external auditing are analyzed: notions such as the importance of the audit quality and the independence of the auditor. More specifically, the relationship between auditor tenure and audit quality is captured for four countries, as mentioned below. The whole investigation gives importance to auditor independence when the audit tenure covers a period of more than three years and reflects the long-term audit tenure. The empirical analysis probes the influence of the financial crisis on external audits in the four largest countries of the Eurozone – Germany, France, Italy and Spain – for the period between 2005 and 2013.

Many researchers investigate the influence of financial crisis from various aspects. Negative change in GDP is a welfare indicator of the recession. Rose and Spiegel (2011) explore the causes of the crisis using GDP change as an indicator for the crisis taking other variables into account as well. Frankel and Saravelos (2012) use GDP change to explain the 2008–2009 financial crises among various countries. The abovementioned authors support the evidence that financial crisis is associated with a GDP decline. In the present study, two different pieces of evidence of the presence of a financial crisis are used. One is the positive and negative change in the gross domestic product (GDP) characterizing the pre-crisis and in-crisis periods, respectively, and

the alternative evidence, as has already been used in the literature, is obtained by taking the years separately for the period between 2005 and 2013, which is examined in the present study in two sub-periods: pre-crisis and crisis.

We use two different definitions of a crisis, as we want to measure the impact of auditor tenure on audit quality with two methods of crisis investigation. The first piece of information about crises is new in this area of study, and for this reason, we emphasize it in our findings. The second definition of a crisis is known in the literature, and we apply this dummy variable in our methodology to validate our results. Our results obtained with the two definitions of crisis are similar and support our overall evidence about the four countries from the first GMM model.

A number of studies (DeAngelo, 1981; Ghosh & Moon, 2005; Pott et al., 2009; Rahmina & Agoes, 2014) support the notion that the independence of auditors is important because auditors are concerned about their earnings from the audit company and are sometimes influenced negatively by the owners of the audit firm. They are bribed and criticized for the comments that they provide in the financial statement of the audited company. It is important for auditors to be independent from the directors of audited companies, as this is a good indicator that they can provide an objective opinion. Furthermore, they will not only be concerned with their own interests and will provide a good report for the audited company for which they are responsible.

As a result, the auditor tenure is the key for an auditor to provide a report without prejudices and manipulation of earnings. If an auditor conducts a good analysis of the company's financial position, then the company will disclose information that will be useful to the investors and shareholders of the company, and they will follow a different strategy from one relying on a faulty report. In addition, it is costly for a company to change its auditor in the short term; consequently, we examine the case in which an auditor serves in a company for more than three years overall, as only then can he or she provide a good analysis full of his or her own opinion. Below, we review our results to understand whether auditors are independent in the four biggest European countries.

Reviewing our findings, we do not observe a statistically important relationship between long-term tenure and discretionary accruals in three out of the four countries, the exception being Spain. This means that the long-term persistence of the auditor in a company does not influence the audit quality and hence the independence of the auditor. This finding is in agreement with the study by Johnson et al. (2002) for US companies. In addition, this study uses an advanced methodology, namely the GMM model, to test the importance of the two external auditing factors that are analyzed. Following our methodology, undertaking a more specific analysis, we proceed with the GMM model, taking into account the crisis with an alternative definition to provide robustness results for the former model. The results of the robustness test agree with the findings of the main methodology. This means that our estimate using the former method is valid and confirmed by the alternative methodology.

The above study is executed for the first time in relation to the global financial crisis, as auditors are concerned about their independence, which is threatened by the effects of a crisis, during extreme turbulent periods. Our aim is to determine whether they remain independent and to identify their behavior in the first three years of tenure and afterwards. Thus, we examine the effects of auditor tenure in the long term, as these are important for audit companies that want to approach different clients to provide their services and keep their auditors happy. However, it is difficult for audit companies to keep all their clients happy, resulting in them losing some clients and maintaining a portfolio of clients who somehow remain satisfied with the basic services provided. For this reason, we analyze only the first four biggest countries (Germany, France, Italy and Spain) and compare their results regarding the relationship between auditor tenure and audit quality. As mentioned above, this relationship is confirmed for Spain and not for the other three countries. The implications are that the larger the country, the larger the

audit company and the maximum degree of independence of the auditor. The crisis is found to influence the independence of auditors in Germany and France, confirming the above finding for Spain. This holds for both models with the main and robustness results.

This paper is structured as follows. Section 1 discusses the literature review of the whole study, section 2 provides the data set and section 3 presents the methodological aspect of the GMM method. In section 4, the results are analysed in detail, and the robustness of the results is discussed in section 5. Finally, last section concludes and provides the most important policy implications for accountants and auditing regulators.

1. LITERATURE REVIEW

There are studies that have used the GDP as an estimated variable of the financial crisis. Kamin (1999) and Hong and Tornell (2005) concluded that a reduction of the GDP in a country means that the country is under the influence of a financial crisis; a reduction of the GDP is a substantial indicator for measuring a financial crisis. Hong et al. (2010), in a study of 21 developed economies in Asia for the period from 1961 to 2007, reported that a financial crisis is connected to a reduction of the GDP. Rose and Spiegel (2011), in a study that measured the consequences of the crisis, used the change in the GDP as an indicator of a crisis, among other variables. Furthermore, Frankel and Sarvelos (2012) examined the degree to which indicators such as the change in the GDP can help to explain the appearance of the 2008-2009 financial crisis in different countries and concluded that, regardless of the particularities that may exist among the countries, the presence of a financial crisis in each country is related to the reduction of the GDP.

Apart from the crisis, important roles in this study are played by the audit quality and the tenure of the auditor in a company. This can be short-term or long-term according to Deis and Giroux (1992) and Knechel and Vanstraelen (2007). Some studies have assumed that there is a lack of auditor independence, as auditors want to keep their current clients in their portfolio (Geiger & Raghunandan, 2002; Carcello & Nagy, 2004). Geiger and Raghunandan (2002) believed that faults in the auditor's quality of reporting regarding assets and liabilities can happen only in the first years of tenure. Knechel and Vanstraelen (2007) asserted that, in the long term, the auditor can issue an accounting report without prejudices. In particular,

the auditor is more likely to issue a negative report in the first two years of work than in the last year of audit tenure. Thus, the independence of auditors during their tenure is important. In addition, the auditor tenure was found to be independent in the long run, as the discretionary accruals are not related to the auditor tenure (Carey & Simnett, 2006). The fact is that the auditor needs time to acquire experience in the company being audited (Gul et al., 2009).

In addition, auditors do not have the same experience as their tenure increases, and the cost of the company increases when companies change their auditors. Therefore, it is not efficient for companies to change their auditors in the short term. As the years pass, auditors' independence, and thus their audits' quality, decreases in comparison with the situation of short-term tenure (Ghosh & Moon, 2005; Ye et al., 2006). In contrast, Myers et al. (2003) and Gul et al. (2009) believed that long-term auditor tenure increases the independence of the auditor.

In Belgium, the assertions regarding auditor tenure and audit quality are contradictory (Knechel & Vanstraelen, 2007; Ball et al., 2015). In the USA, for the period from 1986 to 1995, Johnson et al. (2002) asserted that auditor tenure is related to the manipulation of the company's profits and the deterioration of the audit quality when the tenure is shorter than three years. The manipulation of financial statements and its relationship with the auditor tenure have also been examined in the literature. The audit quality is not affected by the auditor tenure (Carcello & Nagy, 2004). In Taiwan, the interchange of auditors has a positive effect on the quality of the reports; however, the results for German companies are the opposite (Chi & Huang, 2005; Watrin et al., 2008).

Similar findings regarding German companies were found by Jackson et al. (2008); however, the results are similar to the findings for Taiwan reported in Jenkins and Velury's (2008) study. In particular, the latter believed that the obligatory interchange of auditors may be destructive for the shareholders, those who keep bonds and others who have an interest in the company, due to the fact that it may influence negatively the presentation of negative facts in the financial statements. In Italy, Cameran et al. (2008) found similar results to those for Taiwan. They supported the assertion that the obligatory interchange of auditors does not influence the audit quality positively. More specifically, they concluded that there is a positive influence of auditor tenure on audit quality, while they did not determine whether the independence of auditors is reduced with an increase in auditor tenure.

Gonzalez-Diaz et al. (2015) examined the relationship between auditor tenure and audit quality for the period from 2003 to 2010 in Spain and found that the audit quality was reduced with an increase in auditor tenure, supporting the notion that the auditor tenure should be reduced in audit firms. In addition, Ghosh and Moon (2005) concluded that there is a positive relationship between earnings quality and auditor tenure, which means that the longer the auditor tenure, the better the independence of the auditor and hence the audit quality. In parallel, their research study put forward the opinion that the establishment of the obligatory interchange of auditors will produce new costs for investors due to the fact that a new auditor in the first years of auditor tenure will not have the specialized knowledge of the audited company and consequently will need more time to ensure the audit quality, meaning that a greater cost is produced for the company.

Furthermore, Carey and Simnett (2006) studied the influence of long-term auditor tenure on audit quality. More specifically, they studied a sample of 1021 companies in 1995 in Australia and concluded that long-term auditor tenure reduces the audit quality when this is counted through the lens of audit reports with doubt when issued by the auditor. In contrast, when discretionary accruals were used as an indication of audit quality, an important relationship was not identified between

the auditor tenure and the audit quality. Similarly, Ye et al. (2006) concluded that long-term auditor tenure influences the independence of the auditor negatively; as a result, the audit quality is influenced negatively in relation to shorter auditor tenure. Carcello and Nagy (2004) supported the assertion that the manipulation of financial statements happens during the first years of auditor tenure and consequently long-term auditor tenure does not reduce the audit quality and the auditor's independence.

Finally, Jackson et al. (2008) concluded that an increase in the auditor tenure increases the likelihood of manipulation of an unconditional financial statement. In parallel, they stated that there is no change in the audit quality over the upcoming years and there is no need for auditor interchange. In contrast, they believed that the interchange of auditors is not productive for the markets and that the costs for the controlled companies are more than the benefits from these interchanges. They assumed that the audit quality and the independence of the auditor are not influenced by the interchange of auditors and that other factors influence the audit quality and the independence of the auditor.

2. DATA SAMPLE AND DESCRIPTIVE STATISTICS

The data set was taken from the Datastream database. The sample consists of 628 German, 628 French, 208 Italian and 112 Spanish companies that do not belong to the financial industry. In particular, financial companies that are banks, insurance, pension and brokerage firms have been excluded from the analysis, as their accounting measures are not always comparable with those of non-financial firms. The period spans from 2005 to 2013. For the financial crisis, the GDP change for each country is used (Dimitras et al., 2015). In the years when the GDP change is negative, it is assumed that the country is under the influence of the financial crisis. Alternatively, the years when the countries under investigation are experiencing the impact of the financial crisis are common to all of them and equal to the financial crisis's definition period that was provided by Iatridis and Dimitras (2013), accounting for the years 2009–2013 in the current study.

Tables 1 and 2 (see Appendix) present the descriptive statistics of the mean and standard deviation for all the variables that are used in the current study, divided into those with a GDP greater than zero and those with a GDP smaller than zero. The important analysis of these two tables is defined by the construction of the CRISIS variable, as shown in the methodological part of this paper. The highlighted result is that the discretionary accruals are negative in both tables, while all the other variables are positive. For most of the variables, the mean is below zero, and the standard deviation is the highest for the leverage effect in France and the lowest for the DISTRESS3 variable in the same country when the GDP is positive for both previous cases.

3. METHODOLOGY AND DEVELOPMENT OF THE RESEARCH QUESTION FOR THE CURRENT STUDY

Many studies have examined the relationship between the auditor tenure and the audit quality in a period of financial crisis. For instance, see Frankel et al. (2002), Ashbaugh et al. (2003), Chung and Kallapur (2003), Reynolds et al. (2004), Hoitash et al. (2007) and Al-Thuneibat et al. (2011), among others. Based on the above research, we examine, with the GMM (Generalized Method of Moments) method of Arellano and Bond (1991), the above research question for German, French, Italian and Spanish non-financial firms for the period from 2005 to 2013. The advantage of the GMM model over the OLS methodology is that in the GMM model, first the coefficients of the variables are estimated and then are compared with those of a new estimation for verification. In particular, the GMM methodology considers two alternative estimations, the second one contains an improvement of the first one, free of heteroscedasticity, autocorrelation and multicollinearity. Below, we present our variables that are considered for the GMM methodology.

More specifically, we take into account the following 10 variables in accordance with the literature: TENURE, OCF, SIZE, BIG4, LEV, ROA,

DISTRESS1, DISTRESS2, DISTRESS3 and CRISIS. In the model below, we follow the literature and we do not only include the two main variables that we examine, but we also include a set of control variables as they have been developed in the literature. This is done in order to increase the accuracy of our coefficient estimates.

We include the TENURE (Krishnan & Krishnan, 1997) variable because many researchers use it to examine the relationship between audit quality and persistence of the auditor, and the variable OCF (Becker et al., 1998; Myers et al., 2003; Gul et al., 2009) is used to capture the relationship between cash flows and discretionary accruals. In addition, the variable SIZE (Kim et al., 2003; Chen et al., 2005; Carey & Simnett, 2006) is included to isolate the size of companies, and the variable BIG4 (Becker et al., 1998; Chen et al., 2005; Corbella et al., 2015) is used to examine the relationship between the size of the auditor and the audit quality. The variable LEV (Hay et al., 2006; Hoitash et al., 2007) captures the relationship between the leverage effect and the discretionary accruals, while the variable ROA (Corbella et al., 2015) relates the discretionary accruals to the return on assets. The variables DISTRESS1, DISTRESS2 and DISTRESS3 indicate: a) the existence of negative net profits, b) the appearance of negative working capital and c) the simultaneous presence of negative net profits and negative working capital (Habib et al., 2013). Finally, for the variable CRISIS, the GDP change is used, for which the years are separated into two categories based on the study by Dimitras et al. (2015). In the first category, we include the years when the change in the GDP is negative, constituting the period of crisis, while in the second category, we include the years when the change in the GDP is positive and set the period outside the crisis.

We use the following model:

$$\begin{aligned}
 DAC_{i,t} = & \alpha_0 + \alpha_1 TENURE_{i,t} + \alpha_2 OCF_{i,t} + \\
 & + \alpha_3 SIZE_{i,t} + \alpha_4 BIG4_{i,t} + \alpha_5 LEV_{i,t} + \\
 & + \alpha_6 ROA_{i,t} + \alpha_7 DISTRESS1_{i,t} + \\
 & + \alpha_8 DISTRESS2_{i,t} + \alpha_9 DISTRESS3_{i,t} + \\
 & + \alpha_{10} CRISIS_{i,t} + \varepsilon_{i,t},
 \end{aligned} \tag{1}$$

where $TENURE_{i,t}$ is a dummy variable that takes the value of 1 if the tenure of the financial auditor is greater than 3 years and 0 otherwise; $OCF_{i,t}$ is the cash flows; $SIZE_{i,t}$ is the natural logarithm of the sum of assets; $BIG4_{i,t}$ is a dummy that takes the value of 1 if the auditor is a *BIG4* firm and 0 otherwise; $LEV_{i,t}$ is the sum of liabilities to the sum of assets; $ROA_{i,t}$ is the return on assets; $DISTRESS1_{i,t}$ is a dummy variable that takes the value of 1 if in the current year the net profits are negative and 0 otherwise; $DISTRESS2_{i,t}$ is a dummy variable that takes the value of 1 if in the current year the working capital is negative and 0 otherwise; $DISTRESS3_{i,t}$ is a dummy variable that takes the value of 1 if simultaneously in the current year the net profits and working capital are negative and 0 otherwise; $CRISIS_{i,t}$ is the change of the GDP accounting for inflation; and $\varepsilon_{i,t}$ is the error term.

$DAC_{i,t}$ is the dependent variable that measures the discretionary accruals, which are estimated according to the model of Jones (1991) and are equal to the error of the following model, which was presented by Kothari et al. (2004) and Garza-Gomez et al. (2006):

$$AC_{i,t} = \alpha_0 \frac{1}{A_{i,t-1}} + \alpha_1 \Delta REV_{i,t} + \alpha_2 PPE_{i,t} + \varepsilon_{i,t}, \quad (2)$$

where $AC_{i,t}$ is the accruals to the sum of assets in the previous year; $A_{i,t-1}$ is the sum of assets in the previous year; $\Delta REV_{i,t}$ is the annual change in revenues to the sum of assets in the previous year; $PPE_{i,t}$ is the sum of property, plant and equipment to the sum of assets in the previous year; and $\varepsilon_{i,t}$ is the error term.

4. EMPIRICAL ANALYSIS OF THE MAIN RESULTS

The results of the above hypothesis are presented in Table 3 (see Appendix) for the four countries (Germany, France, Italy and Spain), and the period spans from 2005 to 2013. The tenure for the auditor is found to be significant only in Spain, showing that, if the tenure is longer than three years for the auditors in this country,

it means that there is a decrease of 0.443 units in the discretionary accruals. This result shows that correctly we included the *CRISIS* variable in the GMM model, as the only significant relation between audit tenure and audit quality is for Spain. The other countries do not indicate such a significant result which means that *CRISIS* does not affect a lot the main relation in the other countries which we investigate here. This indicates that the audit quality is increasing in Spanish companies in comparison with the other three cases, in which the auditor tenure and audit quality are not significantly related to each other. Our result here is in contrast to the findings of Jackson et al. (2008). The cash flows (*OCF* variable) are found to be significant in Germany and France, albeit with an opposite sign; they are positive and equal to 4.330 in Germany, but negative and equal to 7.350 in France. The coefficient in France is almost twice as important as the coefficient in Germany. This means that the discretionary accruals are influenced more in France than in Germany, and a larger decrease is observed in the discretionary accruals in France than in Germany. This means that companies in France have low liquidity in comparison with those in Germany; see for instance Dechow et al. (1995), Becker et al. (1998) and Chen et al. (2005).

The size is used as a control variable and, when it is used, the results are statistically significant, indicating that the larger the size of the company, the smaller the audit quality, and the independence of the auditor is reduced. This is obvious from the coefficients of the French and Spanish companies, as they are equal to 0.109 and 0.206, respectively. The leverage effect is found to be negative and statistically significant for German, French and Italian companies, being equal to 0.619, 1.171 and 1.223, respectively, showing that this variable affects the discretionary accruals negatively. Thus, the larger the leverage for German, French and Italian companies, the better the audit quality. We observe a similar effect for the return on assets variable, as the coefficient is negative and statistically significant for the German, French and Italian companies. The larger the return on assets, the better the audit quality, the coefficients being equal to 0.703, 3.360 and 1.223, respectively, with a negative sign.

The variables DISTRESS2 and DISTRESS3 are negative for German and French companies, indicating that the negative working capital and the negative net profits and working capital decrease the discretionary accruals and, as a result, increase the audit quality and auditor independence. However, this does not happen in Spanish companies, as the coefficient for the DISTRESS2 variable is found to be positive and equal to 0.733. This means that the smaller the company or the country, the lower the independence of the auditor as far as the audit quality is concerned. Last but not least, the financial crisis had a positive effect on German companies and a negative effect on French companies, as indicated by the CRISIS variable. This means that the independence of the auditor was greater in France than in Germany, as the impact on the discretionary accruals was reduced by the crisis in the former.

The intuitive explanation behind this whole approach with the control variables is that we wanted to isolate some of the most important effects which could affect the relation between auditor tenure and audit quality. The results indicate that most of them are statistically significant and we did well to include all of them. All of these control variables have been investigated in the literature and we took them into account to have a more rigorous analysis of our main results. This rigorous analysis has been captured from the fact that we found the relation between auditor tenure and audit quality to be important only in Spain, indicating the significance of this relation in code law countries in general.

5. ROBUSTNESS OF THE MAIN RESULTS

In this section, we report the results based on an alternative definition of a crisis, which is shown with the variable CRISIS (a dummy with the years pre- and post-crisis). In Table 4 (see Appendix), we test whether the years of the financial crisis affected the relationship between auditor TENURE and audit quality. The results here are similar to the results of the CRISIS (change value of positive and negative GDP) variable as defined in Table 3. This indicates that the financial crisis variable is equally important for the relationship between au-

ditor TENURE and audit quality regardless of the adoption of alternative definitions of this variable for the investigation.

In Table 4 (see Appendix), we find exactly the same significant results for German companies, as we add the same variables as previously shown in Table 3 (see Appendix). Most results for French companies are significant for the same variables that are examined in comparison with Table 3 (see Appendix), with the exception of the LEVERAGE effect, indicating the weakness of the impact of this variable on the discretionary accruals. The rest of the significant results are similar to those in Table 3, showing the overall importance of the initial model.

For Italian companies, we add three variables, namely OCF, SIZE and DISTRESS1, and exclude the variables LEVERAGE effect and ROA, based on the robustness test results of the GMM for this country. The SIZE and OCF variables are found to be important for Italy, indicating that these variables affect the discretionary accruals negatively. DISTRESS1 is found to have an insignificant effect on auditor TENURE. This means that the profits are positive for Italian companies, as the coefficient of this variable indicates, although they are not statistically significant.

For Spanish companies, we add the BIG4 and the DISTRESS1 and DISTRESS3 variables, as shown in Table 4 (see Appendix). The coefficients of these additional variables are found not to be important statistically. This means that the auditor may not be a Big 4 firm, the profits may be positive but this variable is not statistically important and the net profits and capital movement may be positive albeit statistically insignificant. The other variables that we include for Spanish companies, as Table 4 (see Appendix) shows, indicate similarity in their significance in comparison with the same variables of Table 3 (see Appendix).

Finally, the CRISIS variable is found to be significant only for German and French companies. These findings confirm the results in Table 3 (see Appendix), in which we define the CRISIS variable differently from Table 4 (see Appendix). This shows the accuracy of our methodology regarding the impact of the financial crisis on audit quality.

CONCLUSION

In this paper, we examined the impact of auditor tenure on auditor quality through discretionary accruals, also accounting for the impact of the financial crisis on auditor tenure. Our explanatory methodology showed the impact of Spanish auditors' long-term tenure on discretionary accruals, affecting auditors' quality and independence indirectly. The crisis, when the change in the GDP was taken into account, was found to influence German and French companies, with the relationship between auditor tenure and audit quality appearing to be significant statistically only in Spain due to the fact that the latter country belongs to the code law countries. The results for the rest of the countries (i.e. Germany, France and Italy) were found to be insignificant statistically. The results here for the rest of countries apart Spain are insignificant, due to the fact that Germany and France belong to the common-law countries and have a different accounting regulation than Spain and Italy. The result for Italy regardless of belonging to the same code law countries as Spain is different due to the low financial transparency.

The results of the main methodology are robust with the consideration of an alternative definition of a crisis. In particular, the alternative definition of a CRISIS considers the years before and after the crisis with a dummy variable. This variable was found to produce the same results as the first CRISIS variable, which was used in the main methodology, and expressed the change of negative and positive values of the GDP with another dummy variable as well.

Therefore, our results obtained with the GMM methodology are valid, as presented in Tables 3 and 4 (see Appendix), taking into account some control variables. Under these circumstances, one would expect to face problems in relation to the examination of the relationship between auditor tenure and audit quality; however, this is not the case here, as the results agree when the two alternative definitions of a crisis are considered. We would expect to notice some dissimilarity to the literature (e.g. studies on common and code law countries), but our results are in absolute agreement with the findings of Gonzalez-Diaz et al. (2015), thus supporting the school of researchers who believe that there is a negative impact of auditor tenure on audit quality, especially in Spain. These results have some policy implications, which are presented below.

The implications of our results concern the fact that the audit quality depends on the years of tenure, at least in the long term. This means that the audit quality is dependent on his or her tenure, at least in one of the four countries under investigation. In Spain, we found that long-term auditor tenure plays an important role in the dependence of an auditor. Auditors are more dependent when they serve a company for more than three years; this was found at least in Spain, and somewhat similar results were found for the other three countries: Germany, France and Italy. Thus, auditors provide more financial statements with prejudices in smaller countries than in bigger countries. The results of the other three countries – Germany, France and Italy – need further investigation with more accurate assumptions, as the relationship between auditor tenure and audit quality was found to be statistically insignificant.

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APPENDIX

Table 1. Descriptive statistics for Germany, France, Italy and Spain outside the financial crisis for change of GDP > 0

Variables	Mean	St. Deviation
Panel A. Germany		
DAC	-1.67	1.56
TENURE	0.38	0.48
OCF	3.89	3.06
SIZE	4.74	2.43
BIG4	0.55	0.49
LEV	1.19	27.32
ROA	-0.01	0.68
DISTRESS1	0.26	0.43
DISTRESS2	0.17	0.37
DISTRESS3	0.22	0.41
Panel B. France		
DAC	-1.67	2.72
TENURE	0.29	0.45
OCF	1.29	1.08
SIZE	5.10	2.48
BIG4	0.60	0.48
LEV	5.18	208.20
ROA	0.03	2.50
DISTRESS1	0.18	0.38
DISTRESS2	0.21	0.41
DISTRESS3	0.05	0.23
Panel C. Italy		
DAC	-1.98	5.73
TENURE	0.28	0.45
OCF	1.47	0.92
SIZE	5.97	1.83
BIG4	0.87	0.33
LEV	0.62	0.20
ROA	0.02	0.10
DISTRESS1	0.25	0.43
DISTRESS2	0.28	0.45
DISTRESS3	0.11	0.31
Panel D. Spain		
DAC	-1.70	2.05
TENURE	0.31	0.46
OCF	1.84	0.93
SIZE	6.74	1.96
BIG4	0.89	0.30
LEV	0.60	0.21
ROA	0.05	0.10
DISTRESS1	0.14	0.35
DISTRESS2	0.31	0.46
DISTRESS3	0.07	0.26

Table 2. Descriptive Statistics for Germany, France, Italy and Spain during the financial crisis for change of GDP < 0

Variables	Mean	St. Deviation
Panel A. Germany		
DAC	-1.58	1.03
TENURE	0.61	0.48
OCF	1.26	1.00
SIZE	4.71	2.43
BIG4	0.55	0.49
LEV	1.15	12.37
ROA	-0.04	0.65
DISTRESS1	0.38	0.48
DISTRESS2	0.19	0.39
DISTRESS3	0.12	0.33
Panel B. France		
DAC	-1.40	0.88
TENURE	0.59	0.49
OCF	1.29	1.07
SIZE	5.53	2.35
BIG4	0.67	0.46
LEV	0.60	0.27
ROA	0.01	0.12
DISTRESS1	0.27	0.44
DISTRESS2	0.23	0.42
DISTRESS3	0.07	0.27
Panel C. Italy		
DAC	-6.53	48.00
TENURE	0.59	0.49
OCF	1.53	0.91
SIZE	6.11	1.84
BIG4	0.84	0.35
LEV	0.64	0.27
ROA	0.00	0.13
DISTRESS1	0.37	0.48
DISTRESS2	0.35	0.47
DISTRESS3	0.19	0.39
Panel D. Spain		
DAC	-1.48	2.72
TENURE	0.78	0.43
OCF	1.85	0.97
SIZE	6.90	2.03
BIG4	0.91	0.27
LEV	0.66	0.37
ROA	0.03	0.28
DISTRESS1	0.34	0.47
DISTRESS2	0.36	0.48
DISTRESS3	0.20	0.40

Table 3. GMM results for Germany, France, Italy and Spain

Variables	Germany	France	Italy	Spain
TENURE	0.031 (0.059)	0.022 (0.098)	-0.064 (0.104)	-0.443* (0.235)
OCF	4.330** (2.100)	-7.350* (4.100)	—	-9.090 (5.530)
SIZE	—	0.109*** (0.024)	—	0.206*** (0.062)
LEV	-0.619*** (0.066)	-1.171*** (0.222)	-1.223*** (0.251)	0.029 (0.408)
ROA	-0.703*** (0.123)	-3.360*** (0.456)	-1.251*** (0.440)	-0.329 (0.511)
DISTRESS2	-0.513*** (0.081)	-0.271*** (0.137)	-0.296** (0.116)	0.733*** (0.221)
DISTRESS3	-0.225*** (0.063)	-0.593** (0.231)	NA	NA
CRISIS	0.044*** (0.009)	-0.060** (0.025)	-0.013 (0.020)	0.049 (0.046)
Constant	-1.120 (0.064)	-1.270 (0.180)	-0.552 (0.164)	-2.534 (0.450)
R-squared	0.089	0.042	0.052	0.043
J-statistic	2.762	1.417	6.310	13.208

Notes: ***, ** and * mean statistical significance at the 1%, 5% and 10% level, respectively. The standard errors are in parentheses. Instrument specification of GMM: Constant, TENURE, OCF, SIZE, BIG4, LEV, ROA, DISTRESS1, DISTRESS2, DISTRESS3, CRISIS.

Table 4. GMM robustness results for Germany, France, Italy and Spain

Variables	Germany	France	Italy	Spain
TENURE	0.032 (0.052)	-0.091 (0.095)	-0.072 (0.102)	-0.422* (0.233)
OCF	4.950** (1.800)	-7.450* (4.110)	-1.301*** (0.256)	-8.510 (5.510)
SIZE	—	0.112*** (0.024)	-0.932* (0.492)	0.275*** (0.065)
BIG4	—	—	—	-0.292 (0.361)
LEV	-0.702*** (0.063)	-1.187 (0.222)	—	-0.499 (0.427)
ROA	-0.804*** (0.117)	-3.479*** (0.456)	—	0.101 (0.524)
DISTRESS1	NA	NA	0.187 (0.125)	0.469 (0.352)
DISTRESS2	-0.478*** (0.072)	-0.273** (0.138)	-0.316* (0.117)	-1.112*** (0.262)
DISTRESS3	-0.376*** (0.067)	-0.589** (0.232)	—	0.815 (0.491)
CRISIS	0.529*** (0.055)	0.041* (0.094)	0.025 (0.104)	0.187 (0.205)
Constant	-1.447 (0.063)	-1.278 (0.189)	-0.559 (0.175)	-2.313 (0.528)
R-squared	0.100	0.040	0.054	0.067
J-statistic	7.426*	1.409	4.185	1.740

Notes: ***, ** and * mean statistical significance at the 1%, 5% and 10% level, respectively. The standard errors are in parentheses. Instrument specification of GMM: Constant, TENURE, OCF, SIZE, BIG4, LEV, ROA, DISTRESS1, DISTRESS2, DISTRESS3, CRISIS.