EFFECTS OF INTERNAL AUDIT ON FIRM PROFITABILITY. EVIDENCE FROM CEE COUNTRIES

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Abstract: *The aim of the paper is to analyze if independent internal audit committee has effects on firm profitability. By analyzing the annual reports of companies in 11 countries from Central and Eastern Europe (CEE), we aim to highlight the implications and relationships of internal audit independence and the effects on company profitability expressed through return on assets (using pROA acronym in the paper) and return on equity ratios (pROE). The data used in our paper is from 2004 to 2013. We analyzed the listed companies from Central and Eastern Europe using company financial characteristics data collected from Orbis database and dummy variable manually collected by investigating the annual reports of the companies from our sample. Our results, using OLS regressions on panel data (fixed and random effects), suggest that our independent internal audit variable has a positive sign on firm`s profitability. Our findings suggest that independent internal auditors have an important role for the company`s profitability in Central and Eastern Europe (CEE). The analysis could be important for corporate practices, as an evidence for strengthening the role of the independent internal audit committee in companies. In this respect, it could be argued that independent internal audit committee enhance its importance in creating added value, respectively increase company profitability by providing independent and objective opinions, assurance and consulting services regarding the company's activity.*

Keywords: *Internal Audit; Firm Profitability; Central and Eastern Europe.*

JEL Classification: *G3; M42.*

1. Introduction

The establishment of Audit Committees in Europe has become legally required in 2006 through Directive 2006/43/CE on statutory audits of annual accounts and consolidated accounts. Directive 2014/56/EU, states that audit committees must be composed of non-executive members in order to fulfil their mission properly and avoid conflict of interest stipulated also by Regulation 537/2014.
The competitive and constantly changing business environment employs companies under pressure to identify and manage all the risks to which they are exposed. The use of risk management techniques and tools in companies has expanded and internal audit by providing assurance and consulting services contributes in a variety of ways to the company and thus, increasing company profitability and being increasingly important in the current context of the economy.
In practice, in companies from Central and Eastern European countries, the level of information provided by companies on the corporate governance system varies

significantly from company to company and is strongly influenced by laws and regulations of the country in which the company has the residence (Berglof and Pajuste, 2005). While there are differences between countries regarding internal auditing standards, it is necessary (that these principles) to be in conformance with IIA Standards (IIA, 2017). By analyzing the annual reports of companies from Central and Eastern European countries, we aim to highlight the implications and relationships of internal audit independence and the effects on company profitability expressed through return on assets ratio (coded pROA) and return on equity (coded pROE).
Our analysis contributes to the specialized literature by investigating the internal audit independence and its implications on company profitability using a sample of listed companies from 11 countries in Central and Eastern Europe. Furthermore, we consider that this analysis is important in corporate practices in strengthening the role of the independent internal audit committee in the organization, enhancing its importance in creating added value, respectively increasing company profitability.
This paper is organized as follows: Section 2 reviews the literature, Section 3 presents the data and methodology used in our analysis, section 4 provides the results of our analysis and sections 5 delivers conclusions.

2. Literature Review

Internal audit committees perform work that is important for the reporting process of the company, especially for the external financial reporting (Prawitt et al., 2009) and is very important in improving quality regarding financial information (Botez, 2012).
The importance of internal audit in the prevention and detection of fraud has led to a more in-depth analysis of the independence of internal auditors in the literature, as well as the establishment of audit standards to substantiate this concept (IIA, 2017). Internal audit evaluates and contributes in improving corporate risk management and controlling activity within an entity (Zaharia et al., 2014). In order to fulfil their mission and their objectives, internal auditors must be independent and objective (IIA, 2017; Berman, 2006; Balkaran, 2007 and Salierno, 2007; Christopher et al., 2009; Cohen and Sayag, 2010).
Using a sample of 260 US companies (Wallace and Kreutzfeldt, 1991) illustrates the benefits of having an internal audit department in a way in which firms with internal audit departments have higher profit, are liquid and more competent regarding management and accounting, and are more competitive and more efficient. Furthermore, internal audit department contributes in reducing the errors detected by external auditors.
Companies that have independent audit committees and meet at least twice a year are less likely to have fraudulent reporting (Abbott et al., 2000). Using a sample of 156 firms (Abbott et al., 2000) showed that firms with both criteria, independence and activity of the internal audit committee are more likely to detect and remove fraud. Thus, the work and independence of the internal audit committee reduces the likelihood of fraudulent reporting conducting an increase firm profitability.
Using a sample of UK-listed companies (Alzeban and Sawanb, 2015) found that an independent audit committee contributes to higher quality and transparency of financial reporting in an entity. Anderson et al., (2004) analyses the implications of internal audit on the performance of 252 firms in the Lehman Brothers Fixed Income

database and the S&P 500. They suggested that the independence of internal audit contributes in lowering the debt cost and has a positive impact on the company's performance. Zhou et al., (2018) analyzed the implication of internal audit among other corporate governance characteristics using a sample of 774 observations over a 5-year period (2008-2012) for Greek listed companies at the Athens Stock Exchange (ASE), defining the company's performance through return on assets (ROA) and return on equity (ROE). Their results suggest that the independence of internal audit committee has a positive but insignificant association with the company's performance.
In order to analyze the effect of independent internal auditors on company profitability we conducted the following hypothesis *H1. Independent internal audit committee has a positive effect on firm profitability.*

3. Data and Methodology

The data used in the analysis regarding the balance sheet and the financial characteristics of the companies was collected from Orbis database. Specific internal audit data was manually collected from companies` Annual Reports, as well as Internet searches for companies and members of the management body and audit committees. Variable description is presented in table no. 1.

Table 1: Variable description

Variable	Description	Data Source	Expected sign
	Dependent variables		
pROA	The return on assets calculated as EBIDA divided by total assets.	Orbis	
pROE	The return on equity calculated as EBIDA divided by total equity.	Orbis	
	Internal audit variable		
iAI	Dummy variable representing the independence of the audit committee, noted 1 if the audit committee is independent and 0 otherwise.	Hand- collected data	+
	Independent Control Variables (Company Financial Characteristics)		
lnLIQI	Liquidity ratio, calculated as natural logarithm of liquidity ratio	Orbis	+
lnST	Stocks, calculated as natural logarithm of stocks	From Orbis and calculated	+
lnDEB	Debtors, calculated as the natural logarithm of debtors	From Orbis and calculated	-
lnSAL	Sales, calculated as the natural logarithm of Sales	From Orbis and calculated	+/-
rCS	Fixed assets turnover rate	Orbis	+/-
CASH	Cash flow / operating income	Orbis	+/-
Zscore	Z-Score regarding the probability of bankruptcy of the firm.	Calculated after Altman (2000)	-

Source: Authors computation

In calculating the dependent variables, pROA and pROE, we considered EBIDA as the return before interest, rates, depreciation and amortization in that we want to remove the characteristics of the fiscal system. By determining the profitability of companies with the EBIDA indicator, we will test the operational performance of a company that does not consider the characteristics of the fiscal system in different countries in Central and Eastern Europe that could distort the results.
Our control variables are used in accordance with (Abbott et al., 2000; Zhou et al., 2018), which are presented in table 1. In our analysis, we use seven control variables such as liquidity ratio, sales, debtors, stocks, turnover rate of fixed assets, cash flow/operating income and Z-Score regarding the probability of bankruptcy of the firm.
Our interest variable, iAI, indicates the independence of the audit committee, being represented by a dummy variable coded with 1 if the internal audit committee is independent, in that, there is no member in the committee that has also an executive position in the company and 0 if otherwise, in accordance with (IIA, 2017; Directive 2014/56/EU). Brief description of data is presented in table no. 2.

Table 2: Descriptive statistics

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
pROA	878	0.0795	0.0740	-0.0656	0.0332	0.0704	0.1223	0.2430
pROE	748	0.2918	0.2017	0.0035	0.1638	0.2462	0.3789	0.8705
lnLIQI	880	0.3104	0.4957	-0.6730	0.0004	0.2733	0.6210	1.2943
lnST	854	10.4693	1.2983	8.1621	9.5594	10.3968	11.4079	12.7726
lnDEB	865	10.8304	1.3317	7.9625	10.0465	10.8393	11.8838	12.9492
lnSAL	878	13.0846	1.0214	11.5075	12.3977	12.8156	13.6995	15.3472
rCS	878	0.5816	0.5070	0.0198	0.1764	0.4270	0.8266	1.9315
CASH	767	0.1109	0.1042	-0.0337	0.0356	0.0847	0.1542	0.3544
Zscore	820	6.3428	7.5133	0.6672	2.4882	3.8145	6.3364	31.8922

Source: Authors calculation

As we can see from table no. 2, our data is represented by an unbalanced panel dataset that varies from 748 to 880 observations. This is explained by the lack of data regarding some of our independent variables and interest variable.
We used in our sample initially 118 listed companies (1180 observations) from Central and Eastern Europe selected for a ten-year period from 2004 to 2013. The criteria in the data selection was that the company had to be listed, to have data for at least 10 years on Orbis and the turnover to be more than EUR 100,000. Due to the lack of data and the lack of access to some companies` annual reports, especially regarding internal audit committee, the sample limited to about 697 observations for listed companies in Slovenia, Hungary, Slovakia, the Czech Republic, Latvia, Croatia, Romania, Estonia, Bulgaria, Lithuania and Poland.
We used the panel data model, that is defined through some restrictions such as parameter homogeneity (Croissant and Millo, 2008), for all *i,t*, applied to the general

model (equation 1), resulting a linear model pooling all the data across *i* and *t* (equation2). To model individual heterogeneity, the error term has two separate components (one of which is specific to the individual) and does not change over time (equation 3). In the case of *fixed* or *random* effects models: the estimation depends on the properties of the error component, which may be either uncorrelated with the regressors (*random effects* model) or correlated (*fixed effects, within* or *least squares dummy variables* model).

$$y_{it} = \alpha_{it} + \beta_{it}^{T} x_{it} + u_{it} \quad (1)$$

$$y_{it} = \alpha + \beta^{T} x_{it} + u_{it} \quad (2)$$

$$y_{it} = \alpha + \beta^{T} x_{it} + u_{i} + \varepsilon_{it} \quad (3)$$

When time specific components are taken into consideration (e.g. Year) the error has three components:

$$u_{it} = u_i + \lambda_t + \epsilon_{it}$$

The individual component may be either independent of the regressors or correlated. If it is correlated, the ordinary least squares (OLS) estimator of would be inconsistent, so it is customary to treat u_i as a further set of n parameters to be estimated, as if in the general model $\alpha_{it} = \alpha_i$ for all t. This is called the fixed effects (a.k.a. within or least squares dummy variables) model, usually estimated by OLS on transformed data, and gives consistent estimates.

Our fixed effects equation becomes:

$$\boldsymbol{pROA_{it}} = \beta_1 lnLIQI + \beta_2 lnST + \beta_3 lnSAL + \beta_4 LnDEB + \beta_5 rCS + \beta_6 CASH + \beta_7 Zscore + \beta_8 iAI + u_i + e_{it}$$

$$\boldsymbol{pROE_{it}} = \beta_1 lnLIQI + \beta_2 lnST + \beta_3 lnSAL + \beta_4 LnDEB + \beta_5 rCS + \beta_6 CASH + \beta_7 Zscore + \beta_8 iAI + u_i + e_{it}$$

Our random effects equation becomes:

$$\boldsymbol{pROA_{it}} = \alpha + \beta_1 lnLIQI + \beta_2 lnST + \beta_3 lnSAL + \beta_4 LnDEB + \beta_5 rCS + \beta_6 CASH + \beta_7 Zscore + \beta_8 iAI + u_i + e_{it}$$

$$\boldsymbol{pROE_{it}} = \alpha + \beta_1 lnLIQI + \beta_2 lnST + \beta_3 lnSAL + \beta_4 LnDEB + \beta_5 rCS + \beta_6 CASH + \beta_7 Zscore + \beta_8 iAI + u_i + e_{it}$$

Where:

u_i is the unknown intercept for each entity
e_{it} is the error term (idiosyncratic errors)
α – constant
1. *Firm specific variables (used as control variables):*
lnLIQI (Liquidity ratio),
lnST (Stocks)
lnDEB (Debtors),
lnSAL (Sales)
rCS (Turnover rate of fixed assets)
CASH (Cash flow / operating income)
Zscore (Z-Score regarding the probability of bankruptcy of the firm)
2. Internal audit characteristics (our interest variable):
iAI (independent internal audit committee)

4. Results

Some tests were conducted in order to verify the model conditions. For controlling possible correlations regarding the independent variables, we computed the Pearson's correlation matrix available in Appendix 1. Pearson's correlation matrix does not suggest any possible correlations between the independent variables as the largest correlation is between sales (lnSAL) and stocks (lnST).
We conducted both fixed and random effects, as presented in table no. 3, but only the fixed effects results are described, as Hausman (Hausman, 1978) tests (available on demand) for all implied equations suggests.
In table no. 3 we present our results regarding the effects of independent internal audit committee (iAI) on firm profitability, using as dependent variables return on assets ratio (pROA) and return on equity ratio (pROE). In Appendix 2, 3, 4 and 5 we present the complete results of both fixed and random effects models.

Table 3: Panel data regression results for dependent variables pROA and pROE

	(1) Random.individual. Dependent variable: **pROE**	(2) Random.individual. Dependent variable: **pROA**	(3) Within.individual. Dependent variable: **pROE**	(4) Within.individual Dependent variable: **pROA**
VARIABLES				
iAI	***0.0358****	***0.0052***	***0.0116***	***0.0007***
	(0.0158)	***(0.0042)***	***(0.0196)***	***(0.0048)***
lnLIQI	-0.1110***	0.0097**	-0.0939***	0.0064
	(0.0183)	(0.0048)	(0.0223)	(0.0053)
lnST	0.0151	-0.0046	0.0162	-0.0096***
	(0.0101)	(0.0028)	(0.0146)	(0.0035)
lnDEB	-0.0328***	-0.0101***	-0.0581***	-0.0124***
	(0.0114)	(0.0032)	(0.0180)	(0.0042)
lnSAL	0.0117	0.0165***	0.0430	0.0276***
	(0.0166)	(0.0047)	(0.0267)	(0.0065)
rCS	-0.2218***	-0.0701***	-0.2685***	-0.0691***
	(0.0205)	(0.0053)	(0.0280)	(0.0066)
CASH	1.1160***	0.5859***	0.9563***	0.5873***
	(0.1053)	(0.0279)	(0.1348)	(0.0329)
Zscore	-0.0011	0.0006**	-0.0006	0.0008***
	(0.0010)	(0.0002)	(0.0010)	(0.0003)
Constant	0.3672***	-0.0120	-	-
	(0.1324)	(0.0391)		
Observations	682	697	682	697
R^2	0.2169	0.4874	0.2024	0.4746
Adjusted R^2	0.2076	0.4814	0.0810	0.3965
F Statistic	186.3707***	654.0588***	18.7493*** (df = 8; 591)	68.4208*** (df = 8; 606)

Note: Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Independent internal audit committee variable (iAI) has a positive effect on both our measures of firm profitability, return on assets (pROA) and return on equity (pROE) ratios, but regarding the fixed effects model it lacks the statistical significance. Our control variables such as liquidity ratio (lnLIQI) has a negative and statistical sign

on pROE and a positive sign on pROA, stocks variable (lnST) has a positive sign on pROE and a negative and statistical sign on pROA, debtors (lnDEB) and cash flow/operating income (CASH) variables have a negative and statistical significance sign on both pROA and pROE. Sales (lnSAL) variable has a positive and statistical sign on pROA, turnover rate of fixed assets (rCS) has a negative and statistical significance sign on both dependent variables (pROA and pROE) and Z-Score regarding the probability of bankruptcy of the firm has a negative sign on pROE and a positive and statistical significance sign on pROA.
Regarding our interest variable, our results in line with (Zhou et al., 2018) in which the independence of internal audit committee has a positive but insignificant association with the company's profitability, measured by ROA and ROE. Consequently, our results cannot confirm our hypothesis *H1: Independent internal audit committee has a positive effect on firm profitability.* Testing the robustness of our results, the random effects model confirms our hypothesis. Even though we cannot reject the null hypothesis, our variable has the expected sign and our results are in line with other studies (Anderson et al., 2004), that shows the importance of independence of internal audit contributes in lowering the debt cost and positive impact on the company's profitability. Moreover, we consider that in order to fulfil their mission and their objectives, internal auditors must be independent, being in line with (Berman, 2006; Balkaran 2007 and Salierno, 2007; IIA, 2017). Thus, an independent audit committee contributes to higher quality and transparency of financial reporting in an entity, in agreement with (Alzeban and Sawanb, 2015).

5. Conclusions

The research of the paper is focused on analyzing of the effect of independent internal audit committee on firm profitability. Using a sample of listed companies from Central and Eastern Europe countries from 2004-2013 period, our finding showed that the independence of the internal audit committee has a positive effect on company's profitability. Our results, being not statistically significant, we cannot reject the null hypothesis (that coefficient value could take zero value), so we cannot state that the independence of internal audit is directly reflected in company`s profitability, as expressed through return on assets (ROA) and return on equity (ROE) in listed companies from Central and Eastern Europe countries. The results can be explained by the lack of data published by the companies that affects the dimension of our sample. It is expected that in larger samples, the results to be statistically significant, as other studies demonstrate. We consider, though, that the internal auditors should be independent in order to be able to carry out the audit mission in an objective, effective and efficient manner. We also think that independent internal audit committee contributes to better transparency and information communication to shareholders and stakeholders and contributes to the company's long-term objectives. As our judge and specialized literature suggests, when this independence is not present, the audit work may have adverse effects on the performance of the company, creating conflict of interests.
Our main limitation of the study consists in the lack of data regarding the internal audit committee and its activity, due to deficiency in information availability regarding firms. Thus, further research should be considered, when more data will be available.

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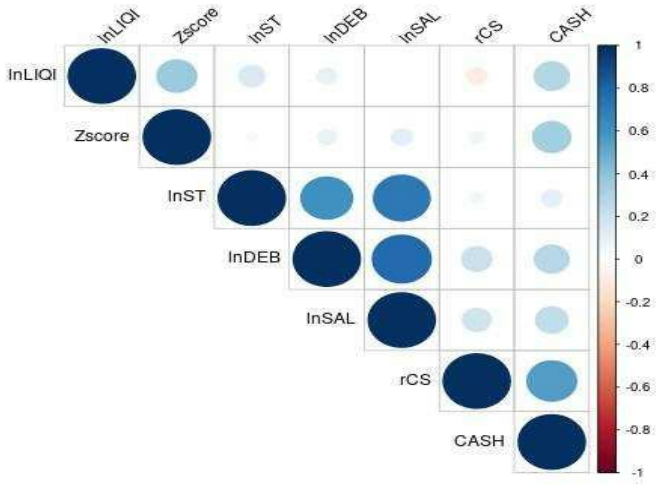
Appendix 1. Pearson's correlation matrix



Source: Authors calculation

Appendix 2. Results of Random Effects models for dependent variable ROE and IAI

Data Panel regression Results								
	Dependent variable:							
	pROE							
	random.individual.pROE.iAI.1	random.individual.pROE.iAI.2	random.individual.pROE.iAI.3	random.individual.pROE.iAI.4	random.individual.pROE.iAI.5	random.individual.pROE.iAI.6	random.individual.pROE.iAI.7	random.individual.pROE.iAI.8
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
iAI	0.0142 (0.0183)	0.0136 (0.0181)	0.0135 (0.0180)	0.0176 (0.0180)	0.0167 (0.0181)	0.0230 (0.0178)	0.0409** (0.0160)	0.0358** (0.0158)
lnLIQI		-0.0663*** (0.0183)	-0.0591*** (0.0190)	-0.0553*** (0.0191)	-0.0540*** (0.0193)	-0.0669*** (0.0189)	-0.1281*** (0.0179)	-0.1110*** (0.0183)
lnST			-0.0022 (0.0086)	0.0102 (0.0101)	0.0070 (0.0116)	0.0022 (0.0114)	0.0128 (0.0101)	0.0151 (0.0101)
lnDEB				-0.0244** (0.0107)	-0.0287** (0.0132)	-0.0226* (0.0130)	-0.0247** (0.0114)	-0.0328*** (0.0114)
lnSAL					0.0105 (0.0192)	0.0127 (0.0188)	0.0015 (0.0165)	0.0117 (0.0166)
rCS						-0.1334*** (0.0211)	-0.2038*** (0.0200)	-0.2218*** (0.0205)
CASH							1.0619*** (0.1015)	1.1160*** (0.1053)
Zscore								-0.0011 (0.0010)
Constant	0.2802*** (0.0187)	0.2993*** (0.0193)	0.3136*** (0.0910)	0.4471*** (0.1082)	0.3891** (0.1521)	0.4281*** (0.1499)	0.4260*** (0.1298)	0.3672*** (0.1324)
Observations	744	744	723	719	719	719	717	682
R^2	0.0001	0.0149	0.0115	0.0181	0.0185	0.0703	0.1967	0.2169
Adjusted R^2	-0.0013	0.0123	0.0073	0.0126	0.0116	0.0625	0.1888	0.2076
F Statistic	-2.2850	10.7361***	7.5653*	12.5328**	12.8310**	53.6161***	173.6020***	186.3707***

Note: Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix 3. Results of Random Effects models for dependent variable ROA and IAI

Data Panel regression Results								
	Dependent variable:							
	pROA							
	random.individual.pROA.iAI.1	random.individual.pROA.iAI.2	random.individual.pROA.iAI.3	random.individual.pROA.iAI.4	random.individual.pROA.iAI.5	random.individual.pROA.iAI.6	random.individual.pROA.iAI.7	random.individual.pROA.iAI.8
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
iAI	-0.0048 (0.0061)	-0.0029 (0.0060)	-0.0020 (0.0058)	-0.0026 (0.0058)	-0.0034 (0.0058)	-0.0035 (0.0057)	0.0058 (0.0042)	0.0052 (0.0042)
lnLIQI		0.0284*** (0.0058)	0.0382*** (0.0059)	0.0382*** (0.0060)	0.0404*** (0.0060)	0.0352*** (0.0059)	0.0088* (0.0046)	0.0097** (0.0048)
lnST			-0.0016 (0.0027)	-0.0029 (0.0033)	-0.0086** (0.0037)	-0.0102*** (0.0037)	-0.0043 (0.0028)	-0.0046 (0.0028)
lnDEB				0.0022 (0.0033)	-0.0053 (0.0040)	-0.0049 (0.0040)	-0.0112*** (0.0032)	-0.0101*** (0.0032)
lnSAL					0.0183*** (0.0062)	0.0197*** (0.0061)	0.0175*** (0.0047)	0.0165*** (0.0047)
rCS						-0.0484*** (0.0067)	-0.0709*** (0.0051)	-0.0701*** (0.0053)
CASH							0.6197*** (0.0264)	0.5859*** (0.0279)
Zscore								0.0006** (0.0002)
Constant	0.0800*** (0.0068)	0.0705*** (0.0065)	0.0810*** (0.0291)	0.0710** (0.0342)	-0.0273 (0.0507)	-0.0036 (0.0505)	-0.0152 (0.0380)	-0.0120 (0.0391)
Observations	871	871	845	836	835	835	734	697
R^2	0.0002	0.0235	0.0436	0.0440	0.0545	0.1085	0.4956	0.4874
Adjusted R^2	-0.0009	0.0213	0.0402	0.0394	0.0488	0.1021	0.4907	0.4814
F Statistic	-2.6467	20.6827***	38.1113***	38.0591***	47.6396***	100.7077***	713.1928***	654.0588***

Note: Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix 4. Results of Fixed Effects models for dependent variable ROE and IAI

Data Panel regression Results								
Dependent variable:								
	pROA							
	within.individual.pROA.iAI.1	within.individual.pROA.iAI.2	within.individual.pROA.iAI.3	within.individual.pROA.iAI.4	within.individual.pROA.iAI.5	within.individual.pROA.iAI.6	within.individual.pROA.iAI.7	within.individual.pROA.iAI.8
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
iAI	-0.0119* (0.0068)	-0.0113* (0.0068)	-0.0105 (0.0066)	-0.0110* (0.0066)	-0.0126* (0.0066)	-0.0142** (0.0063)	0.0024 (0.0048)	0.0007 (0.0048)
lnLIQI		0.0195*** (0.0064)	0.0304*** (0.0066)	0.0300*** (0.0068)	0.0318*** (0.0067)	0.0252*** (0.0064)	0.0062 (0.0051)	0.0064 (0.0053)
lnST			-0.0038 (0.0035)	-0.0055 (0.0041)	-0.0124*** (0.0047)	-0.0128*** (0.0044)	-0.0089*** (0.0034)	-0.0096*** (0.0035)
lnDEB				0.0029 (0.0043)	-0.0060 (0.0051)	-0.0083* (0.0048)	-0.0147*** (0.0041)	-0.0124*** (0.0042)
lnSAL					0.0229*** (0.0082)	0.0198** (0.0078)	0.0295*** (0.0063)	0.0276*** (0.0065)
rCS						-0.0767*** (0.0081)	-0.0695*** (0.0062)	-0.0691*** (0.0066)
CASH							0.6320*** (0.0312)	0.5873*** (0.0329)
Zscore								0.0008*** (0.0003)
Observations	871	871	845	836	835	835	734	697
R^2	0.0039	0.0158	0.0328	0.0330	0.0445	0.1473	0.4822	0.4746
Adjusted R^2	-0.1196	-0.1077	-0.0913	-0.0941	-0.0828	0.0325	0.4107	0.3965
F Statistic	3.0487* (df = 1; 774)	6.2013*** (df = 2; 773)	8.4582*** (df = 3; 748)	6.3028*** (df = 4; 738)	6.8508*** (df = 5; 736)	21.1622*** (df = 6; 735)	85.6885*** (df = 7; 644)	68.4208*** (df = 8; 606)

Note: Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix 5. Results of Fixed Effects models for dependent variable ROE and IAI

Data Panel regression Results								
	Dependent variable:							
	pROE							
	within.individual.pROE.iAI.1	within.individual.pROE.iAI.2	within.individual.pROE.iAI.3	within.individual.pROE.iAI.4	within.individual.pROE.iAI.5	within.individual.pROE.iAI.6	within.individual.pROE.iAI.7	within.individual.pROE.iAI.8
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
iAI	-0.0137 (0.0210)	-0.0154 (0.0208)	-0.0145 (0.0211)	-0.0076 (0.0213)	-0.0097 (0.0215)	-0.0100 (0.0206)	0.0110 (0.0199)	0.0116 (0.0196)
lnLIQI		-0.0760*** (0.0210)	-0.0752*** (0.0226)	-0.0699*** (0.0229)	-0.0684*** (0.0230)	-0.0861*** (0.0222)	-0.1292*** (0.0217)	-0.0939*** (0.0223)
lnST			-0.0057 (0.0123)	0.0072 (0.0138)	0.0012 (0.0158)	0.0018 (0.0152)	0.0046 (0.0144)	0.0162 (0.0146)
lnDEB				-0.0326** (0.0159)	-0.0410** (0.0192)	-0.0405** (0.0185)	-0.0420** (0.0178)	-0.0581*** (0.0180)
lnSAL					0.0218 (0.0282)	0.0074 (0.0271)	0.0275 (0.0264)	0.0430 (0.0267)
rCS						-0.2074*** (0.0281)	-0.2201*** (0.0267)	-0.2685*** (0.0280)
CASH							0.8780*** (0.1315)	0.9563*** (0.1348)
Zscore								-0.0006 (0.0010)
Observations	744	744	723	719	719	719	717	682
R^2	0.0006	0.0201	0.0180	0.0236	0.0245	0.1024	0.1731	0.2024
Adjusted R^2	-0.1284	-0.1081	-0.1130	-0.1093	-0.1100	-0.0230	0.0558	0.0810
F Statistic	0.4268 (df = 1; 658)	6.7536*** (df = 2; 657)	3.8960*** (df = 3; 637)	3.8173*** (df = 4; 632)	3.1718*** (df = 5; 631)	11.9806*** (df = 6; 630)	18.7551*** (df = 7; 627)	18.7493*** (df = 8; 591)

Note: Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1