MIKOŁAJ NOWICKI[a]

REAL EARNINGS MANAGEMENT, CEO EXPERIENCE, FAMILY OWNERSHIP, AND EXTERNAL AUDITS: A META-ANALYSIS

REALNE ZARZĄDZANIE ZYSKAMI, DOŚWIADCZENIE CEO, WŁASNOŚĆ RODZINNA ORAZ AUDYT ZEWNĘTRZNY: METAANALIZA

This article analyses the relationship between real earnings management (REM) and corporate governance variables, including family ownership, external audit quality, and CEO experience. The studies analysed were published between 2006 and 2021. The Sarbanes-Oxley Act of 2002 and the implementation of international financial reporting standards have led companies to reduce the use of accrual earnings management (AEM), and instead adopt real earnings management. However, many authors claim that using REM might harm a company's long-term well-being, which accentuates the need to study the determinants of REM. The variables analysed in this paper are extensively covered in the literature, however, there is still ambiguity regarding their relationship with REM due to conflicting findings; some studies indicate a positive relationship, while others show a negative one. To resolve this ambiguity, meta-regression analysis is employed. The results indicate a positive relationship between family ownership and REM. This highlights the need to explore other forms of ownership to determine the most effective ownership structure that does not increase REM. This is of interest to legislators. The results provide no evidence to support the statistical or economic significance of CEO experience and external audit in relation to REM.

Keywords: corporate governance; CEO experience; family ownership; external audit; real earnings management
JEL: G, G3, G34

W niniejszym artykule zbadano związek realnego zarządzania zyskami (REM) z wybranymi zmiennymi, które są aspektami nadzoru korporacyjnego: własnością rodzinną, doświadczeniem CEO oraz jakością audytu zewnętrznego. Analizowana próba pochodzi z badań empirycznych opublikowanych w latach 2006–2021. Po ustawie Sarbanesa-Oxleya w Stanach Zjednoczonych (2002) oraz stopniowym wprowadzaniu międzynarodowych standardów rachunkowości na świecie przedsiębiorstwa ograniczyły memoriałowe (księgowe) zarządzanie zyskiem (AEM) na rzecz REM. Wielu autorów podkreśla potencjalną szkodliwość realnego zarządzania zyskiem dla kondycji finansowej przedsiębiorstwa, co wskazuje na potrzebę dokładnego przebadania determinant REM. Badane zmienne są szeroko reprezentowane w badaniach empirycznych, niemniej jednak

[a] Poznań University of Economics and Business, Poland /
Uniwersytet Ekonomiczny w Poznaniu, Polska
mikolaj.nowicki@phd.ue.poznan.pl, https://orcid.org/0000-0003-2271-3397

ich związki z REM pozostają niejednoznaczne ze względu na występowanie licznych pozytyw-
nych i negatywnych wyników badań empirycznych oraz teorii uzasadniających oba kierunki re-
lacji. Wskazana niejednoznaczność wyników uzasadnia użycie metaanalizy w formie regresji do
jednoznacznego ustalenia kierunku oraz siły relacji tych trzech zmiennych wobec REM. Wyniki
wskazują na pozytywną relację między własnością rodzinną oraz REM, jednocześnie akcentując
potrzebę zbadania pozostałych typów własności w celu poznania środków optymalizacji struktury
własności dla ograniczania REM przez organy regulujące. W przypadku audytu zewnętrznego
oraz doświadczenia CEO brak podstaw do uznania relacji tych zmiennych z REM za istotne, za-
równo ze statystycznego, jak i z ekonomicznego punktu widzenia.

Słowa kluczowe: nadzór korporacyjny; doświadczenie CEO; własność rodzinna; audyt zewnętrz-
ny; realne zarządzanie zyskami
JEL: G, G3, G34

I. INTRODUCTION

There are two types of earnings management (EM): accrual-based and
real. The former influences the adopted legal accounting methods and shapes
inter-period adjustments. In contrast, the latter concerns activities affecting
the resources owned by the company and operational activities. Real earnings
management is defined as 'departures from normal operational practices, mo-
tivated by managers' desire to mislead at least some stakeholders into believ-
ing certain financial reporting goals have been met in the normal course of
operations' (Roychowdhury, 2006, p. 337).

Healy and Wahlen define EM as: 'Earnings management occurs when man-
agers use judgment in financial reporting and in structuring transactions to
alter financial reports to either mislead some stakeholders about the underlying
economic performance of the company or to influence contractual outcomes that
depend on reported accounting numbers' (Healy & Wahlen, 1999, p. 6).

The practice of REM usage involves a variety of strategies that companies
may employ to improve their financial results in a short period of time. These
methods include reducing research and development spending, offering price
discounts, and providing more lenient credit terms to boost sales in the short
term, but ultimately have a negative impact on cash flow. Companies may
also engage in overproduction to reduce the cost of goods sold or may cut sales,
or general and administrative expenses, which affect both earnings and cash
flows. While these methods may seem beneficial in the short term, they can
lead to poor resource allocation and be detrimental to the company's long-term
well-being.

Over the past 20 years, the topic of REM has become increasingly popular
in the scientific literature, and the reason is related to the implementation
of the International Financial Reporting Standards (IFRS) and the passage
of the Sarbanes-Oxley Act (SOX) in 2002. According to Cohen et al. (2010),
SOX prompted companies to reduce accrual earnings management (AEM)

practices, and at the same time it increased the relative risks of using AEM compared to REM. As a consequence, managers started to use REM practices on a larger scale. With an abundance of data and the development of the REM estimation methods proposed by Roychowdhury in 2006, scholars were able to study REM in a reliable and quantitative way. The overall number of articles regarding financial factors and their relation to REM started to grow at an exponential rate. Research also became more detailed over time, including financial characteristics and issues related to corporate governance. However, the state of knowledge did not advance proportionally to the volume of research, as the results tend to vary substantially from negative and significant to positive and significant. In other words, despite numerous studies, little can be concluded decisively on the matter of corporate governance and REM. Still, the importance of uncovering the exact determinants of REM stems from the possibly harmful long-term consequences of REM that arise from companies misallocating their resources in the process of REM usage.

Building on Yaari and Ronen's (2008) taxonomy that splits corporate governance into three categories, namely gatekeepers, ownership structure, and management characteristics, the variables with the most potential impact on REM were chosen, one from each category. These variables – family ownership, external audit, and CEO experience – potentially impact REM more than other variables from the three categories. Numerous studies indicate a high level of interest among researchers, but at the same time, the relationship of studied variables with REM remains ambiguous due to the abundance of both positive and negative associations found in primary studies.

Companies owned by families include the majority of listed corporations as well as privately held companies around the world (Villanoga & Amit, 2020). The prevalence of this type of ownership implies that in a practical sense, the potential for shaping REM practices is highest for family ownership out of all types of ownership. An external audit is fundamentally important in the sense that it serves as an independent party and provides assurance about the quality of financial reporting in a company. Due to the AEM-REM substitution, a high-quality external audit may paradoxically prompt companies to use REM because according to García-Meca and Sánchez-Ballesta's meta-analysis (2009), the quality of the external audit constrains AEM. In many countries, participants in the stock exchange are obligated to use external audits to validate their financial reporting. Thus, the biggest companies in most countries in the world are under the influence of external audits by the Big Four companies, meaning that the potential impact of REM is substantial. One of the most important functions of an external audit is to strengthen the credibility of a financial statement. REM, however, might blur the informativeness of a financial statement in the sense that stated profit does not reflect the company's potential but rather is an effect of short-term artificial increase. Thus, REM may undermine the external auditor's contribution to increasing the credibility of a financial statement, and the relationship between these two variables

should be examined. Regarding CEOs and their relationship with REM, in the Graham et al. (2005) study the majority of executives claimed that they would rather compromise the long-term value of a firm if it meant achieving short-term profit goals by using earnings management. The crucial question in this matter is whether the CEOs' experience can promote a change in attitude to prioritize long-term value. Therefore, this study aims to answer the question of how family ownership, external audits, and CEO experience affect REM.

Due to the highly ambiguous nature of relationships between family ownership, CEO experience, external audit, and REM, the method used in this study is meta-analysis, as it allows a researcher to uncover additional information about a given sample of studies compared to the primary empirical studies and, if applied correctly, to draw stronger conclusions about the relationship between variables of interest when compared to empirical studies or literature reviews. The research in this article was specifically conducted using the meta-regression approach (MRA) described by Stanley and Jarrell (1989), used in the extended form by Geyer-Klingeberg, Hang, and Rathgeber (2021).

The results indicate that out of the selected factors, CEO experience and external audit do not constrain REM, while family ownership is significantly and positively associated with REM, meaning that, on average, according to multiple studies included in this meta-analysis, the greater the family involvement is in a particular company, the more likely the company is to use REM. None of the variables are affected by selective reporting, presumably due to the theoretical cues that can support both positive and negative results. The article contributes to the literature by synthesizing scientific knowledge related to the studied variables and their connections to REM, and by determining the sources of differences in the results of empirical studies. The analysis of empirical literature published over the timespan of 15 years provides little evidence that CEO experience and external audit are related to REM in a significant way, and at the same time reveals that family ownership is positively related to REM, but the association is not economically significant.

Another contribution of interest to legislators and investors regards the lack of effect of corporate governance aspects on reducing REM. As for the ambiguity in the literature, this might be an effect of certain studies reporting significant relationships that only apply in a specific setting, resulting from interactions between countries and a subset of companies.

The remainder of the paper is organized as follows: Section II contains the hypothesis development, with an emphasis on the ambiguity of the results in the empirical literature. Section III is devoted to the study design, sample collection algorithm, and a description of the importance of the method of meta-analysis in the context of this study. In Section IV, the detailed results of the research are presented. Section V concludes the paper and suggests the future direction of research.

II. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

1. CEO experience and real earnings management

A summary of the literature on CEO experience is presented in Table 1. In the empirical literature, substantial differences are seen in the results regarding the relationship between REM and CEO experience, as shown in this section.

Malik (2015) studied how various management characteristics and types of ownership are related to REM in US companies. He found, contrary to expectations, that board size is not significantly associated with REM. However, CEO duality and institutional ownership of shares are negatively related to REM. Alhmood et al. (2020) examined Jordanian-listed companies from 2013 to 2018. The results indicate that CEO experience is measured by the number of executive positions held previously, and CEO political connections are positively related to the REM level. CEO tenure is insignificantly related, and CEO duality negatively and significantly affects REM.

Hsieh et al. (2014) studied CEO overconfidence and its association with REM and AEM based on US companies from 1991 to 2009. They find that overconfidence is associated with CEOs' upward earnings management activities. Companies with overconfident CEOs have significantly lower abnormal discretionary expenses and higher abnormal operating cash flow relative to companies with non-overconfident CEOs. Khlifi and Zouari (2021) examined the relationship between CEO overconfidence and REM with a sample composed of US-listed companies in the 2012–2018 period. The results show that overconfident managers of both acquiring and target companies manage their results more by using REM than other managers.

Table 1

CEO experience – literature summary

Authors	Year	Sample year	Variable	Sign	Sample size	Country
Malik	2015	2008–2010	CEO duality	−	7,852	United States
Hsieh et al.	2014	1991–2009	CEO overconfidence	+	5,319	United Kingdom
Alhmood et al.	2020	1992–2011	CEO duality, CEO tenure	−/no effect	348	Jordan
Khlifi and Zouari	2021	2012–2018	CEO overconfidence	+	280	United States

Source: the author's elaboration.

Based on the premise that the professional traits and experience of a CEO should contribute to a greater awareness of the possible harmful consequences of REM, the following hypothesis is proposed:

> *H1: There is a significant and negative association between CEO experience and REM.*

2. Family ownership and real earnings management

Regarding the relationship between family ownership and REM, a summary of the literature on the subject is presented in Table 2. The literature is not unambiguous on the matter of the relationship between REM and family ownership.

Razzaque et al. (2020) studied corporate governance reform in Bangladesh and its relation to real earnings management. They concluded that corporate governance moderates the relationship between family ownership and real earnings management usage. In other words, before the corporate governance reform, family ownership was significantly and positively associated with real earnings management, and afterward, that relationship became negative.

Achleitner et al. (2014) examined 838 German companies between 1998 and 2008 for the use of accrual and real profit management, dividing the sample into family and non-family businesses. The results of the study indicate that family businesses are less involved in REM than other enterprises. Family businesses might be apprehensive about REM and its perceived long-term harmful consequences that are contradictory to the criterion of maximizing the company's value.

Ghaleb et al. (2020) studied how family ownership affects REM in Malaysian-listed companies in the manufacturing sector from 2013 to 2016. The results indicate that family ownership concentration is significantly and negatively related to real earnings management use. Alternative regression shows that the association is subject to diminishing returns; the higher the level of family ownership, the lower the marginal effect.

Table 2

Family ownership – literature summary

Authors	Year	Sample year	Variable	Sign	Sample size	Country
Achleitner et al.	2014	1998–2008	Family ownership	−	4,937	Germany
Ghaleb et al.	2020	2013–2016	Family ownership	−	1,056	Malaysia
Cherif et al.	2020	2014–2016	Family ownership	+	729	France
Razzaque et al.	2020	2006–2016	Family ownership	−/+	1,314	Bangladesh

Source: the author's elaboration.

Cherif et al. (2020) examined French-listed companies from 2014 to 2016 and found that family ownership is significantly and positively associated with real earnings management. According to the study, family firms are subjected to the type II agency problem: a conflict between controlling and minority shareholders. REM supposedly serves as a means of control. Wang (2006) presented two theoretical explanations of the relationship between family ownership and REM. The first, the alignment effect, indicates that the large stock ownership and long-term orientation of family owners prevent them from engaging in REM, which is possibly harmful in the long term. The second explanation, the entrenchment effect, states that there is a possible conflict of interests between family owners who are also managers and non-family minority shareholders that can result in lower earnings quality. The results of Wang's study support the notion that family ownership is related to higher earnings quality.

To summarize, in the case of family ownership, theoretical explanations can support both negative and positive relationships. The following hypotheses, H2a and alternative hypothesis H2b, are proposed:

> *H2a: The association between family ownership and REM usage is statistically significant and positive.*
> *H2b: The association between family ownership and REM usage is statistically significant and negative.*

3. External audit and real earnings management

Khanh and Kuong (2018), who analysed Vietnamese-listed companies between 2010 and 2016, found that audit quality proxied by the presence of the Big Four auditors is not associated with real earnings management level. The authors suggest that financial market development moderates this relationship, and weak investor protection does not allow higher-risk companies to be pressured into appointing effective audit companies.

Chowdhury and Eliwa (2021) found a significant and positive association between the presence of the Big Four auditors and real earnings management. The study was conducted on selected companies listed in the UK from 2005 to 2018, focusing only on the enterprises that maintained or marginally (up to 1%) increased their earnings in period t compared to period t-1. The results indicate that even the Big Four auditors are unable to constrain REM usage in the post-IFRS period among listed companies that intend to signal their prospects by meeting particular profit benchmarks or forecasts. Similar to the previous study, which examined companies with strong upward earnings management incentives, Chi et al. (2011) studied US-listed enterprises from 2001 to 2008 that met last year's earnings benchmarks, like the zero earnings benchmark or analyst forecast benchmark. Their results also indicate a positive relationship between the presence of the Big Four auditors and real earnings management level. According to the authors, high-quality auditors are more effective in constraining accrual earnings management, and that prompts companies to use real earnings management instead. Another sig-

nificant association found by the authors is that longer audit tenure relates to a higher real earnings management level.

Choi et al (2018) found a significant and negative relationship between the presence of the Big Four auditors and real earnings management usage in a sample of companies from European and Asian countries. The relationship is also moderated by the strength of the legal regime, and country-level governance moderates the relationship between audit quality and real earnings management.

Table 3

External audit – literature summary

Authors	Year	Sample year	Variable	Sign	Sample size	Country
Chi et al.	2011	2001–2008	Big four presence	+	925	United States
Choi et al.	2018	1995–2004	Big four presence	−	24,463	International
Khanh & Kuong	2018	2010–2016	Big four presence	No effect	1,687	Vietnam
Chowdhury & Eliva	2021	2005–2018	Big four presence	+	4,774	United Kingdom

Source: the author's elaboration.

Based on the premise that external audit firms face a substantial reputational cost in the case of failure and are a bigger litigation target than other firms (Brown et al. 2011), the hypothesis is as follows:

> *H3: The association between external audit and REM usage is statistically significant and negative.*

III. STUDY DESIGN

1. Sample

The sample for the meta-analytical study comprises primary empirical studies and estimations, collected in two searches.

The first sample search was conducted with 'earnings management' as a keyword in databases such as Google Scholar, Science Direct, JSTOR, and SSRN. The second search was carried out in the Poznań University of Economics and Business meta-database, including publishers such as Wiley-Blackwell, Taylor & Francis, Marketline, Springer, SourceMedia, Emerald, Routledge, Sage, and the American Accounting Association. The keyword

for the search was 'Real Earnings Management' with the year of publication from 2006 onwards (in practice, the end year of the sample is 2021) following Roychowdhury's (2006) REM detection method publication.

Papers needed to meet the following criteria:

1) The study should have at least one regression model.

2) The results should be presented so that it is possible to obtain t-statistics either directly or through p-values and degrees of freedom or standard errors. Studies that reported estimates solely with asterisks were rejected.

3) The dependent variable should be measured according to Roychowhury's method.

The sample that meets the above criteria includes 180 primary studies published in scientific journals that have 1,987 regression models in total. Each model contains multiple variables, and variables related to corporate governance are categorized following Yaari and Ronen's taxonomy. Every estimate in the form of a t-statistic or p-value was transformed into meta-analytical units called effect sizes, in the form of partial correlation coefficients. Out of the available regression models, estimates related to the CEO experience, external audit quality, and family ownership were chosen for the regression meta-analytical models.

The final sample used in the regression models is: for family ownership, 15 studies and 198 effect sizes; for CEO experience, 16 studies and 135 effect sizes; and for external audit, 89 studies and 782 effect sizes.

2. Effect size and meta-regression model

The effect size is a value that reflects the strength of the relationship between the selected variables. It is used in a meta-analysis as an explained variable regarding the relationship of interest. In this study, partial correlation coefficients (PCC) were calculated as follows[1]:

$$r_{ij} = \frac{t_{ij}}{\sqrt{t_{ij}^2 + df_{ij}}} \, , \tag{1}$$

where: t-statistics reported in an i-th study and j-th estimation; degrees of freedom reported for a study i and an estimation j; effect sizes concerning the relations of CEO experience, family ownership, and external audit with REM are taken as dependent variables in a meta-regression model, three models in total.

In addition to the effect sizes, standard errors of partial correlations are also needed in a regression model, as a primary explanatory variable to test

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[1] Since t-stat is needed for further computations, in the case of having a beta coefficient and standard error, the t-stat was computed as a ratio of the beta coefficient to the standard error, and in the case of the p-value, the t-stat was computed using the t-distribution density function and degrees of freedom.

the existence of selective reporting. The standard error was estimated as follows:

$$SE_{(r_{ij})} = \sqrt{\frac{(1-r_{ij}^2)}{df_{ij}}} \, , \qquad (2)$$

where: partial correlation coefficient for a study i and estimation j; degrees of freedom reported for a i-th study and j-th estimation.

The extended version of the meta-regression model, referred to as MRA, as proposed by Stanley (2007), allows researchers to analyze studies on a deeper level regarding various moderating variables, omitted variables, or a problem of endogeneity. In the meta-regression model, the estimates are regressed on a set of explanatory variables that quantify study characteristics and biases (Geyer-Klingeberg et al., 2020). Table 4 contains the definitions of independent variables.

The MRA model is estimated as follows:

$$r_{ij} = \gamma_0 + \gamma_1 SE(r_{ij}) + \sum_{l1=1}^{L1} \varphi_{l_1} s_{ijl_1} + \sum_{l2=1}^{L2} \varphi_{l_2} z_{ijl_2} + u_{ij} \, , \qquad (3)$$

where: r_{ij} – observed effect size in study i and estimation j; $SE(b_{ij})$ – standard error of the effect size in study i and estimation j; S_{ijl1} – dummy variables indicating if a particular variable is present in study i and regression j – accounts for omitted variables, the variable is also referred to as matrix/vector **S**; Z_{ijl1} – variables (continuous or dummy) that moderate effect sizes b_{ij}, such as data types, estimation methods, geographical location, years of study, the variable is also referred to as matrix/vector **Z**; L_1 – number of explanatory variables in vector **S**; L_2 – number of explanatory variables in vector **Z**.

Table 4

Variable definition

Variable	Definition	Matrix
SIZE	1 if the size is used as a control variable in a primary study, 0 otherwise	S
PROFITABILITY	1 if the primary study research included profitability as a control variable, 0 otherwise	S
LEV	1 if the primary study research included leverage as a control variable, 0 otherwise	S
AEM	1 if the primary study research included accrual earnings management as a control variable, 0 otherwise	S
NA	= 1 if the country from the primary study research sample is classified into the North American region, 0 otherwise	Z

Table 4 (*continued*)

Variable	Definition	Matrix
EUR	1 if the country from the primary study research sample is classified into the European region, 0 otherwise	Z
ASIA	1 if the country from the primary study research sample is classified into the Asian region, 0 otherwise	Z
MULTIREGIONAL	1 if the country from the primary study research sample is classified into more than one region, 0 otherwise	Z
MODEL	1 if the country from the primary study research sample used the OLS model, 0 otherwise	Z
YEARFE	1 if the country from the primary study research sample used a panel regression model with year fixed effect, 0 otherwise	Z
INDUSTRYFE	1 if the country from the primary study research sample used a panel regression model with industry fixed effect, 0 otherwise	Z
YEARFE	1 if the country from the primary study research sample used a panel regression model with industry fixed effect, 0 otherwise	Z
COUNTRYFE	1 if the country from the primary study research sample used a panel regression model with country fixed effect, 0 otherwise	Z
INDUSTRYYEARFE	1 if the country from the primary study research sample used a panel regression model with industry and year fixed effects, 0 otherwise	Z
YEARFIRMFE	1 if the country from the primary study research sample used a panel regression model with year and firm fixed effects, 0 otherwise	Z
COUNTRYINDUSTRYFE	1 if the country from the primary study research sample used a panel regression model with country and industry fixed effects, 0 otherwise	Z

Source: the author's elaboration.

The rejection of the null hypothesis, H_0: $\gamma_1 = 0$, tests the presence of publication bias. The corresponding regression parameter γ_1 measures the direction and magnitude of the bias. The estimated value for the intercept, γ_0, is the mean effect size across all studies, assuming that SE is close to zero. Thus, rejecting the null hypothesis, H_0: $\gamma_0 = 0$, is a test for the existence of a genuine effect beyond a publication bias (Geyer-Klingeberg et al., 2020).

3. Variables of interest

The studied variable in the category of management characteristics, namely CEO experience, is an aggregate construct, composed of several variables found in primary studies that are connected to desirable CEO charac-

teristics, such as tenure, educational background, or the number of executive positions held by a CEO. The second aggregate variable studied concerns various ways in which a family exerts control over a company, such as shareholding, positions held in supervisory or management boards, or shareholding above a certain threshold (controlling impact). The last aggregate variable referring to the external audit is the most homogenous one, as its components refer to high-quality external audits in the form of the Big Four auditors, or the Big Five if we consider studies on older samples. The full list of variables that constitute these aggregate variables is given in Appendix.

These variables are composed of multiple effect sizes from multiple studies aggregated based on similar definitions. Explanatory variables in the estimated meta-regression model concern partial correlation coefficients (PCC) between each of these variables and REM. The analytical formula of an MRA model is presented below:

$$r_{ij} = \gamma_0 + \gamma_1 SE(r_{ij}) + \varphi_1 * SIZE + \varphi_2 * PROFITABILITY + \varphi_3 * LEV + \varphi_4 *$$

$$AEM + \varphi_5 * EUR + \varphi_6 * ASIA + \varphi_7 * INTERNATIONAL + \varphi_8 * MODELTYPE +$$

$$\varphi_9 YEAR + \varphi_{10} INDUSTRY + \varphi_{11} COUNTRY + \varphi_{12} * INDUSTRYYEARFE + \varphi_{13} *$$

$$INDUSTRYYEARCOUNTRYFE + \varphi_{14} * COUNTRYINDUSTRYFE + \varphi_{15} * YEARFIRMFE + u_{ij},$$

(4)

where: each model refers to the PCCs of one dependent variable: family ownership with REM, CEO experience with REM, and external audit with REM; – standard error of PCC of family ownership, CEO experience, and external audit with REM, indicates publication bias.

The other variables are defined in Table 4. Variables in the S-matrix – SIZE, PROFITABILITY, LEV, and AEM are included in the MRA to prevent 'omitted variable bias'. If primary studies do not include these variables, their estimates can be inaccurate due to the omission of relevant explanatory variables and the estimator bias related to them. Variables in the matrix **Z** refer to the structural heterogeneity and relevant characteristics of primary studies that can influence the PCC in a significant way. In this study, potentially relevant groups of characteristics include: geographical regions and model specification, namely the type of model and type of fixed effects used in a model.

Each set of categorical variables has a base category omitted from the model. In the case of geographical regions, NA is a base category, which means that the coefficients of EUR, ASIA, and MULTIREGIONAL need to be interpreted as changes in PCC value relative to the NA sample of studies. A negative and significant EUR coefficient in family ownership regression would mean that studies on European samples reveal significantly lower PCC than in NA, which potentially would hint at a higher restricting effect of family ownership on REM in European companies. With the type of fixed effects, the base category is no FE in a model, so every coefficient related to the fixed effects should be interpreted as a change in a PCC in studies with a particular type of effect in comparison to the studies that estimate models with no FE. In the case of the model, the base category is OLS.

IV. EMPIRICAL RESULTS

1. Descriptive statistics

The quantitative summary of the examined variables is presented in Table 5. The share of positive and negative estimates is equal in the case of the BIG variable. CEO_PROF and FAMILY are inclined more towards positive estimation, although the fact that approximately 40% of estimations have negative signs emphasizes the ambiguity of the results.

Table 5

Summary of variables of interest

Name	Estimations	Studies	Share of positive/negative estimates in a sample
External Audit	782	89	49.83%/50.17%
CEO experience	135	16	60.74%/39.26%
Family ownership	198	15	60.10%/39.90%

Note: Share of estimates is defined as a ratio of estimates with a certain sign to the total number of estimations in a sample.

Source: the author's elaboration.

Table 6 provides information regarding various characteristics of the data.

Table 6

Descriptive statistics of variables of interest

Sample characteristics	Family	CEO_PROF	BIG
Geographical location	NA:43.4% EUR:8.1% ASIA: 37.9% MULTIREGIONAL:10.6%	NA:31.9% EUR:16.3% ASIA:27.4% MULTIREGIONAL: 24.4%	NA:35.5% EUR:9.2% ASIA:43.9% MULTIREGIONAL:11.4%
Mean PCC	1.18%	0.94%	−0.18%
Median PCC	0.67%	0.83%	−0.12%
Model	OLS 89.4% Other (2SLS, GMM): 10.6%	OLS: 76.3% Other (2SLS, GMM) 23.7%	OLS: 81.7% Other (2SLS, GMM): 18.3%
No. of studies	15	16	89
No. of estimates	198	135	782

Source: the author's elaboration.

Most estimations regarding variables of interest come from the NA and Asia; in all three cases, these two regions account for many observations. Multiregional and European samples are less numerous and account for the remaining share of observations ranging from 20% to 40%, depending on the variable. Average partial correlation values are close to either one percent or zero, which means that uncorrected means show a negligible relationship between selected variables and REM. Most of the observations were estimated using OLS models. The other category containing the two-step Heckman procedure, or GMM, occurs significantly less frequently.

2. Results of meta-regression

The next sections contain detailed models concerning the relationships between the studied aspects of corporate governance and REM. Due to multicollinearity, not all the final models contain the same set of explanatory variables, although the initial set of variables for each model is the same.

2.1. Family ownership and REM

A funnel graph is a scatter diagram of all empirical estimates of a given phenomenon and the precision of these estimates (in this case, the inverse of the estimate's standard errors, 1/SE). If there is no publication bias, the funnel plot should resemble a symmetrical distribution around the most precise estimations, forming an inverted funnel (Geyer-Klingeberg et al., 2020).

Figure 1

Funnel plot of variable family ownership
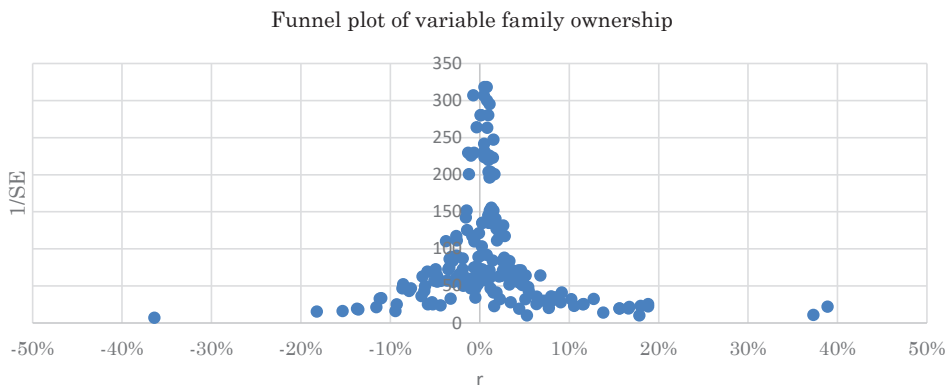
Source: the author's elaboration.

With the family ownership variable, the funnel plot resembles a symmetrical distribution, with points being symmetrically spread around the Y-axis. The greater the spread of points, the closer they are to the X-axis. The lack of

asymmetry, combined with an equal spread around the mean value, indicates that there is no publication bias, although precise testing will be performed within the weighted least squares regression model.

Table 7

Meta-regression model results – family ownership

| Parameter	Coefficient	*t*-stat	*p*-value	Significance
Const	0.012	4.44	1.59E-05	***
SE	0.252	0.71	0.4811	–
SIZE	−0.009	−1.18	0.2392	–
PROFITABILITY	−0.005	−0.79	0.4265	–
AEM	−0.004	−1.01	0.3118	–
MODELTYPE	0.012	2.621	0.0095	***
ASIA	−0.004	−0.89	0.3733	–
EUR	0.005	1.22	0.223	–
MULTIREGIONAL	0.001	0.18	0.8608	–
YEAR	0.006	0.57	0.5717	–
INDUSTRYYEARFE	0.003	1.15	0.2506	–
INDUSTRYYEARCOUNTRYFE	0.008	1.25	0.2137	–
COUNTRYINDUSTRYFE	0.009	0.17	0.8645	–
YEARFIRMFE	0.007	1.14	0.2549	–
INDUSTRY	−0.005	−0.98	0.3264	–
FIRM	0.023	1.71	0.0892	*
COUNTRY	0.039	4.37	2.08E-05	***
Number of studies		15		
Number of estimates		198		

Source: the author's elaboration.

It appears that there is a statistically significant value for the partial correlation between family ownership and REM beyond the publication bias. It is positive, which means the higher the family ownership in a company, the higher the REM we can expect in a company. The result is in line with the aforementioned entrenchment effect, as opposed to the alignment effect. However, the fact that the parameter is statistically significant does not imply economic significance, as the value of 1.2% is not significant economically. The parameter indicating the presence of a publication bias is not significant. Contrary to the expectations that the relationship between family ownership and REM might be dependent on the region and its economic development, regional differences between the selected base category (NA) and other regions such

as Europe, Asia, or international samples do not differ significantly. Studies that do not contain the typical control explanatory variables SIZE and PROFITABILITY do not differ significantly from the studies that consider these variables. The variable MODEL is statistically significant and positive, meaning that models in primary studies estimated by a different procedure than OLS show a stronger relationship. Models that differ from OLS in the sample usually utilize a two-step Heckman procedure, or GMM, to mitigate potential endogeneity problems and show a weaker relationship, probably because of the stricter assumptions of these models compared to OLS. Models that account only for country-fixed effects show a stronger relationship between family ownership and REM, as do studies that account for the firm-fixed effect.

2.2. CEO experience and REM

The presented funnel plot for the variable CEO experience (Fig. 2), similar to the previous variable, resembles a symmetrical distribution. The more points are spread around the mean PCC, the lower the precision of the estimate.[2] As the asymmetry is indicative of selective reporting, it appears that there is no relation between partial correlation values and their standard errors; therefore there is no publication bias.

Figure 2

Funnel plot of variable CEO experience
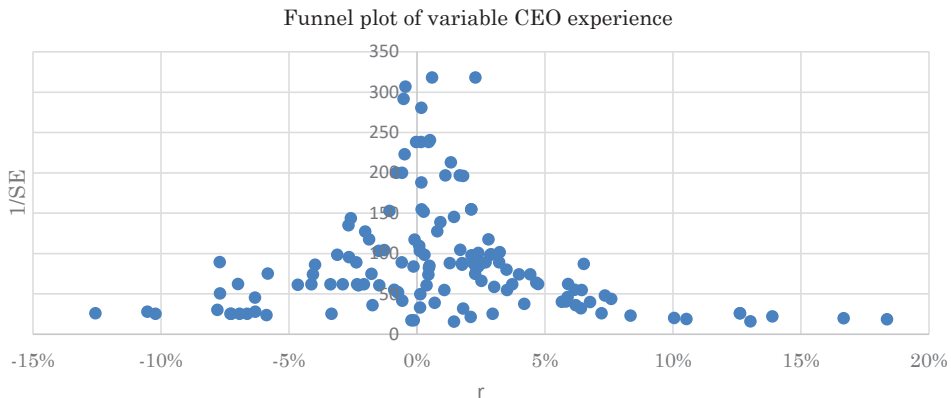
Source: the author's elaboration.

According to the meta-regression model concerning the CEO experience variable, an intercept and SE are not statistically significant, which means that within the sample both the corrected effect and publication bias do not occur. In other words, there is little support for the notion that experienced CEOs affect REM in any direction. While experienced CEOs with long tenure

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[2] PCCs in low precision studies should be spread more around the mean value than in high precision studies because the latter are supposed to consistently yield similar PCC values, and be closer to the 'unbiased value'.

and a good educational background should be more aware of REM and its potential consequences, the propensity of a CEO to support or be against REM might be more related to their psychological traits, as Mutschmann (2018) obtained results showing that managers scoring high on the dark triad personality traits (narcissism, Machiavellism, and psychopathy) are positively related to REM practices. Experienced CEOs with undesirable personality traits may impact real earnings management positively, while experienced CEOs with a lack of dark triad features are negatively related to REM; however, the matter requires further investigation.

Together with a funnel plot, the results might imply that the studies examining the relationship between CEO experience and REM that find significant associations are the ones with lower precision. The perception of the significance of the relationship between CEO experience and REM may be driven by the spurious correlations appearing in the low-precision studies as well, although that conclusion would require further investigation.

In studies that account for the PROFITABILITY control variable or the LEV control variable, CEO experience becomes negatively related to REM. The lack of relation between CEO experience and REM is likely to be geographically universal because the main effect denoted by the Beta0 (Const) coefficient is not significant either, which would imply that the effectiveness of the CEO experience is the same globally as regionally. The type of model and type of fixed effect do not alter the average effect either.

Table 8

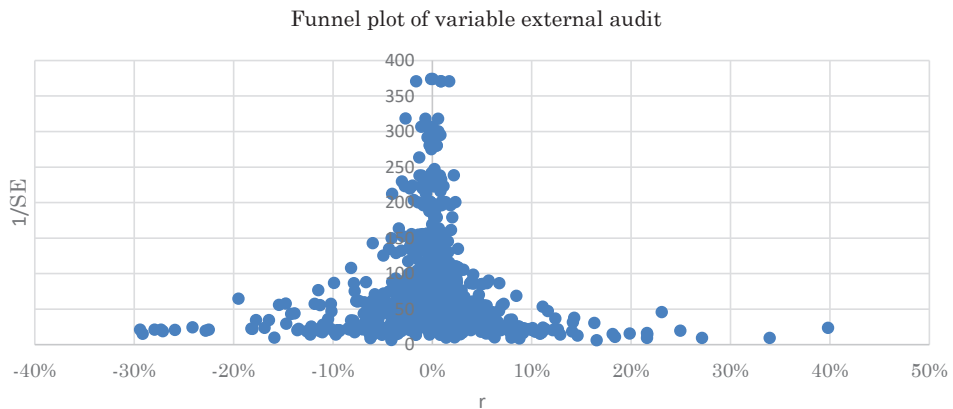Meta-regression model results – CEO experience

Parameter	Coefficient	t-stat	p-value	Significance
Const	0.001	0.15	0.8774	–
SE	−0.009	−0.24	−0.2449	–
SIZE	0.018	1.76	0.0796	*
PROFITABILITY	−0.019	−2.94	0.0040	***
LEV	−0.010	−2.17	0.0322	**
AEM	0.008	1.49	0.1398	–
MODEL	0.002	0.29	0.7710	–
ASIA	0.007	0.84	0.4014	–
EUR	0.007	0.94	0.3491	–
MULTIREGIONAL	0.008	1.17	0.2441	–
INDUSTRYYEARFE	0.002	0.38	0.7036	–
YEAR	−0.001	−0.12	0.9059	–
YEARFIRMFE	0.015	1.87	0.0638	*
INDUSTRY	−0.004	−0.50	0.6203	–
Number of studies		16		
Number of estimates		135		

Source: the author's elaboration.

2.3. External audit and REM

The funnel plot for the variable BIG4 shows a symmetrical spread around the Y-axis. It appears that in the case of this variable, publication bias does not occur.

Figure 3

Funnel plot of variable external audit

Source: the author's elaboration.

Table 9

Meta-regression model results – external audit

Parameter	Coefficient	t-stat	p-value	Significance
Const	0.001	0.48	0.6306	–
SE	0.002	0.01	0.9908	–
SIZE	−0.0001	−0.14	0.8871	–
PROFITABILITY	−0.001	−0.35	0.7288	–
LEV	−0.006	−2.04	0.0419	**
AEM	0.004	2.35	0.0193	**
MODEL	0.0002	0.06	0.9505	–
ASIA	−0.001	−0.5	0.6173	–
EUR	−0.003	−1.12	0.2621	–
MULTIREGIONAL	0.001	0.47	0.6357	–
INDUSTRYYEARFE	0.002	0.97	0.3326	–
YEAR	0.002	0.62	0.538	–
COUNTRYINDUSTRYFE	−0.005	−0.92	0.3558	–
YEARFIRMFE	0.001	0.39	0.6948	–
INDUSTRYFE	−0.003	−0.33	0.7448	–

Table 9 (*continued*)

Parameter	Coefficient	*t*-stat	*p*-value	Significance
FIRMFE	−0.042	−1.55	0.121	–
COUNTRYFE	−0.001	−0.34	0.7328	–
Number of studies		89		
Number of estimates		782		

Source: the author's elaboration.

In a meta-regression model concerning the external audit variable, an intercept and SE are not statistically significant, which means that there is no publication bias, but the base effect (intercept) is also not significantly different from zero. Similarly, concerning CEO experience, this might imply that the significant correlations observed in primary studies come from low-precision studies. This might also imply that auditors and management possibly overlook the issue of real earnings management because REM is not prohibited by law and the aim of auditors is to ensure that financial statements comply with legal regulations, not to assess if decisions related to production, cash flows, and discretionary expenses are adaptations to changing economic circumstances or indicative of REM practices. In studies that account for the LEV control variable, the effect becomes negative on average. The inclusion of the AEM variable makes the average effect stronger. Contrary to expectations, geographical location in comparison to the NA as a base category does not differ significantly for studies focused on Asia or Europe, or studies with a multiregional sample. This might relate to the fact mentioned earlier that REM is not regulated by law in any of the geographical regions, and thus the phenomenon is out of the auditor's scope in all regions alike. The type of model and type of fixed effect do not alter the average effect either.

IV. DISCUSSION AND CONCLUSIONS

The effect beyond publication bias in the case of the family ownership variable is significant; the result is in line with the entrenchment effect, although the value of the partial correlation is 1.2%, which is not an economically meaningful relation. The result, however, might be of interest to legislators, as the positive relationship between family ownership and REM means that this type of ownership does not discourage companies from REM, and legislators should not expect it to do so. In another study, performed by Kabaciński et al. (2022), the authors found that institutional investors in general are not significantly related to REM, but conditional dependence exists. Corporate policymakers and investors should be aware that both types of ownership – family and institutional – do not constrain REM practices, and they should adjust their expectations accordingly.

Publication bias seems to not occur with the studied variables; it might be connected to the lack of strong theoretical cues about the expected signs of these relations, as in the case of family ownership theory, which can explain both negative and positive associations. The literature appears to be inconclusive because the described effects have strong variance, as was shown in the funnel plots, and in this case there is a plethora of both significant and positive and significant and negative estimations varying across the mean effect, which is close to zero.

Geographical location does not affect the results in a significant way, contrary to expectations, which in the case of family ownership is not in line with the notion that the relationship depends on the development of the country or region. None of the regional explanatory variables are significant across all models. Results might be conditional upon other factors than those accounted for in this study, such as accounting for endogeneity in a primary study, the variables that are the focus of a study, and the number of control variables from the corporate governance category included in a one-regression model.

As the external audit and CEO experience are uncorrelated to REM in an unconditional way and family ownership is connected positively, legislators might consider other solutions to encourage companies not to apply REM practices that are potentially harmful and value-decreasing in the long term. Similarly, investors aware of REM practices might reflect on increasing their active monitoring role in a company, especially in companies with high family ownership, as there is no evidence that external audits or CEOs with professional traits mitigate REM practices.

The lack of a relationship between CEO experience and REM might imply that CEOs may overlook the issue of real earnings management or that their other traits affect REM instead. The lack of a relationship between REM and external audit might also imply that the significant associations found in the literature review come from studies with lower precision or even studies that make these variables their focus. As a suggestion for the future, moderators could indicate whether the variable is the focus of a study, or splitting the sample into low- and high-precision studies could be introduced to test whether studies that do not primarily focus on variables display lower absolute values of the partial correlation coefficient.

The potential difference in PCC values between studies in which a variable is a main focus and studies in which that variable is not a main focus might be due to the fact that authors of non-focus studies might not deliberately search for the models in which the non-focus variable is statistically significant, while authors of studies in which a variable is the main focus might compute various models and selectively report those in which the main-focus variable is significant. To strengthen conclusions from this study, additional research could be performed with an increased number of moderators, possibly including the legislative system, and corrections for additional differences in study characteristics and samples, including working papers.

The limitation of this study is that the meta-regression model does not account for potential interactions between explanatory variables. Certain types of REM might be region-dependent. Therefore, for future research, it might be worth investigating the interactions of heterogeneity drivers using meta-analytical structural equation modeling (MASEM).

Moreover, it might be beneficial to divide studies by the sample selection criteria used in these studies because relations might be more pronounced in specific subsamples. Models can also be improved by using observations around the articles from which they originate.

Another relationship that can be tested is whether low-precision (high SE) studies inflate the value of absolute PCC, because if that is the case, then it might imply that researchers aim to obtain a significant relationship regardless of the sign.

Appendix: Full list of publications and variables used in a meta-analysis
https://docs.google.com/spreadsheets/d/e/2PACX-1vTKewP8hXbkTx58JuC-ZyhEK3dYZ3jBj2stFBeGKgpU_6o14pnAbxWGgpuvBi-yGjPqkKGGOCbiz-d6AU/pubhtml

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