Real Earnings Management and Quality of Corporate Governance: A Meta-Regression Analysis

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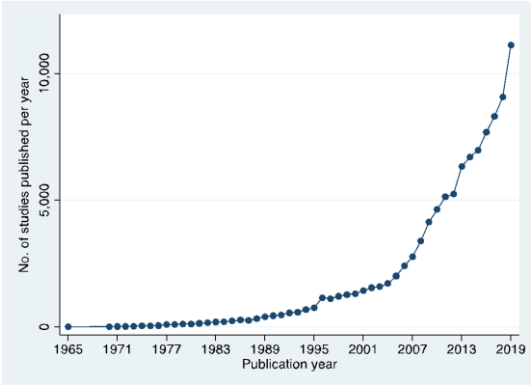
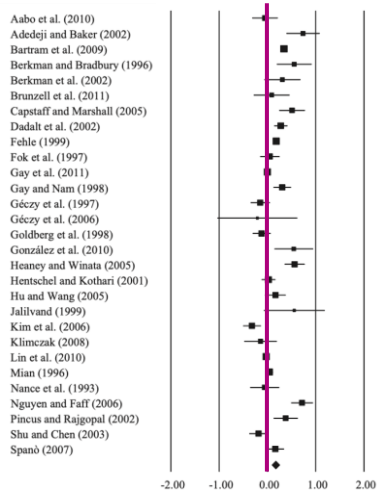
Introduction to Meta-Analysis - Business & Finance

Exponential growth	Heterogeneity	Credibility



Number of Scopus search results between 1965 and 2019 for published articles in finance.

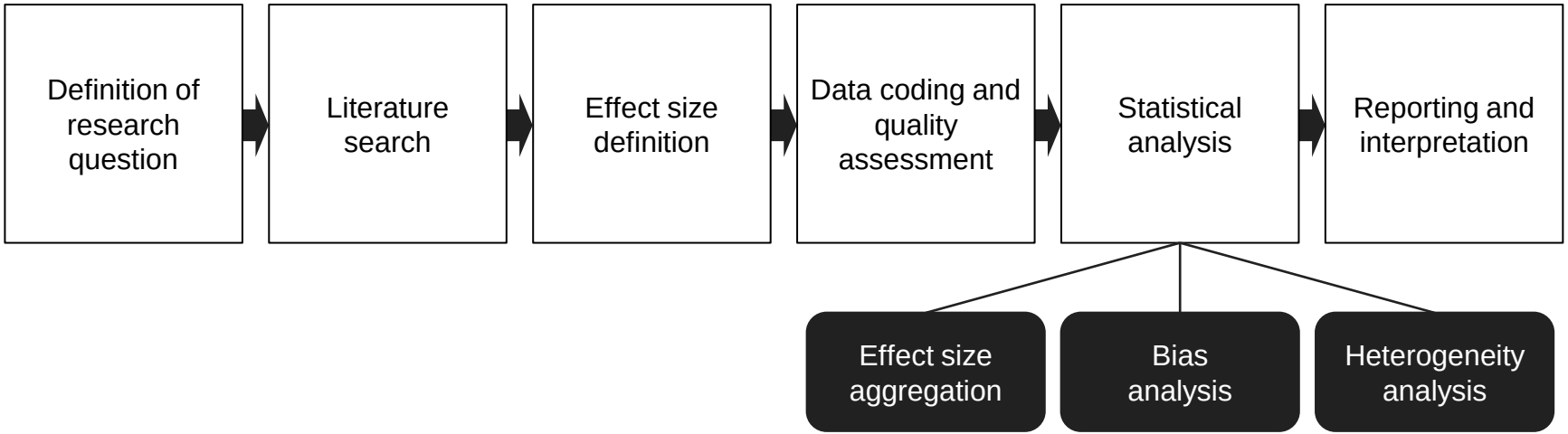


Forest plot of 29 studies on the impact of corporate leverage on corporate hedging (Arnold et al. 2014: 451).

Source: https://www.craigmarker.com/file-drawer-problem/

Introduction to Meta-Analysis - Definition & Process

"Meta-analysis refers to the **analysis of analyses**. I use it to refer to the **statistical analysis** of a large collection of results from **individual studies** for the purpose of **integrating** the findings." (Glass, 1976: 3)



Motivation and research question

- What is earnings management (EM)?
- Why we deal with EM?
  - EM can affect the future performance of a company
  - EM has dominated the research in accounting for about three decades (Habib, A. et al. 2022)
  - We saw an opportunity to focus on real earnings management (REM) (Sarbanes – Oxley act; the implementation of International Financial Reporting Standard (IFRS) negatively effects the earning management)
  - Potential interest in our study would come from synthesizing research on REM in the context of corporate governance (CG)
  - The use of meta-analysis created an opportunity to apply a comprehensive approach and overcome the ambiguity of the results

Theoretical background

- The tendency to use REM by corporate management is often explained by **agency theory**. A **negative relationship** between REM and CG is predicted by this theory (Cohen & Zarowin, 2010, Kothari et al., 2016, Roychowdhury, 2006).

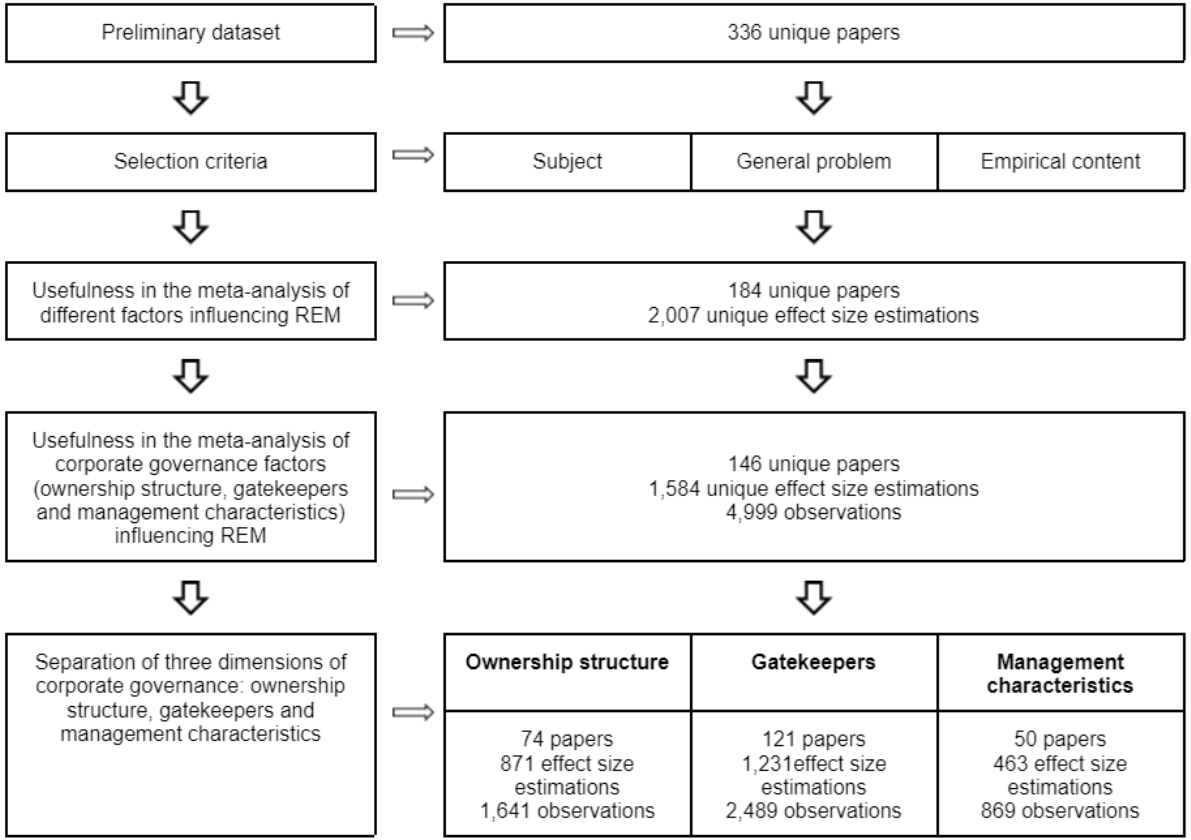
- Some research results on the relationship between REM and CG can be interpreted from the point of view provided by **signaling theory**. In this case a **positive relationship** between REM and CG is predicted (Gunny, 2010, Al-Shattarat et al., 2018). (signal private information to capital market participants).

- Considering the ambiguity of supporting the above-mentioned theories by the results of research to date, we expect that the results of our synthesizing research provide new evidence on these theories.

Key issue and literature ambiguity

	Ownership structure	Gatekeepers	Management characteristics
Positive impact on REM	When more corporate representatives are appointed, family firms have a higher degree of divergence between control rights and ownership, and a higher level of REM (Wei and Chou, 2020).	Cohen and Zarowin (2010) show a positive relation between external audit quality and REM.	Chief executing oficer CEO duality increases REM through sales activities (Nuanpradit, 2019). CEO's experience has a positive impact on REM (Sun et al., 2014; Kouaib & Jarboui, 2016).
Negative impact on REM	Family ownership is associated with a lower level of earnings management because family benefits are consistent with company benefits (Wang, 2006; Jiraporn & DaDalt, 2009; Adiguzel 2013; Achleitner et al., 2014) socioemotional wealth (SEW).	The more analysts investigate firms, the less REM is carried out (Enomoto, Kimura and Yamaguchi, 2015).	Independent directors are capable of constraining R&D cuts motivated by short-term pressures (Garcia Osma 2008).

Data collection - Research sample



Data collection - Moderators

Ownership structure	Gatekeepers	Management characteristics	Regional and other structural heterogeneity moderators	Differences in measurement of REM	Differences in effect size estimation characteristics	Differences in data and publication characteristics
Institutional ownership*	External audit quality*	Executives compensation*	North America*	REM * **	Control for size	Number of observations
Insider ownership	Board of directors activity	CEOs turnover	Europe and Central Asia	ABNPROD***	Control for profitability	Average year
Family ownership	Institutional framework	CEOs professionalism	East Asia and Pacific	ABNEXP***	Control for loss	Peer-reviewed
State ownership	Independence of board members	CEOs duality	Rest of the world	ABNCFO***	Control for leverage	
Other	Internal audit quality	Female presence in the board	Common law system	ABNCFO&ABNEXP	Control for MTB	
	Other	Other		ABNEXP&ABNPROD	Control for AEM	
				Other	Fixed effects model	
					Endogeneity	
					Robust errors	

Notes: *indicates a base category in MRA. **REM is a sum of ABNPROD, ABNEXP and ABNCFO. ***ABNPROD stands for abnormal production costs, ABNEXP stands for abnormal discretionary expenses, ABNCFO stands for abnormal cash flows from operations

Methodology - Three-step analysis

Effect size aggregation

$$PCC_{ij} = \beta_0 + \varepsilon_{ij}$$

Publ. bias analysis

$$PCC_{ij} = \beta_0 + \beta_1 SE(PCC_{ij}) + \varepsilon_{ij}$$

Heterogeneity analysis

$$PCC_{ij} = \beta_0 + \beta_1 SE(PCC_{ij}) + \sum \gamma_{ij} Z_{ijk} + \varepsilon_{ij}$$

Model specification:

- WLS meta-regression with inverse variance weighting to accommodate heteroscedasticity
- Standard errors clustered at the level of individual studies to accommodate effect size dependency

Results - Publication bias analysis

	(1) Ownership structure	(2) Gatekeepers	(3) Management characteristics
Mean effect ($\widehat{\beta}_0$)	-0.002 (-0.60)	-0.002 (-0.60)	-0.004 (-0.54)
Bias ($\widehat{\beta}_1$)	-0.425 (-1.50)	-0.020 (-0.08)	0.001 (0.01)
No. of observations	1,641	2,489	869
No. of studies	74	121	50

Notes: This table shows the results of the publication bias test by estimating Eq. (1) without the moderator variables Z. $\widehat{\beta}_1$ measures the presence and magnitude of publication bias. $\widehat{\beta}_0$ denotes the mean partial correlation corrected for publication bias The model is estimated by weighted least squares estimation using the inverse of the estimates' squared standard errors as weights. The *t*-statistics of the regression parameters reported in parentheses are based on standard errors clustered at the level of the individual studies.

Results - Heterogeneity analysis

Variable	Ownership structure	Gatekeepers	Management characteristics
Mean effect (β_0)	-0.017 (-0.02)	-0.429 (-0.47)	-0.139 (-0.06)
Bias (β_1)	1.561 (1.05)	0.042 (0.09)	-3.226*** (-3.75)
INSIDER	0.015** (2.05)		
FAMILY	0.025* (1.93)		
STATE	-0.054*** (-10.04)		
OTHER	0.032*** (5.18)		
BOARD		0.006 (1.06)	
INST_FRAMEWORK		0.008 (1.57)	
INDEPENDENT		0.006 (1.13)	
ANALYST		-0.027*** (-3.11)	
INT_AUDIT		0.008 (0.37)	
OTHER		-0.025*** (-3.11)	

Results - Heterogeneity analysis, cont.

Variable	Ownership structure	Gatekeepers	Management characteristics
CEO_CHANGE			0.002 (0.43)
CEO_PROF			0.003 (0.70)
DUAL			0.023* (1.74)
GENDER			0.012 (0.68)
OTHER			-0.013 (-1.57)
ECA (Europe&Central Asia)	-0.003 (-0.35)	0.008 (1.22)	-0.009 (-0.32)
EAP (East Asia& Pacific)	0.020*** (2.66)	-0.005 (-1.18)	-0.029 (-1.29)
Rest of the world	0.010 (1.53)	0.010 (1.54)	0.038* (1.71)
Common law	0.013** (2.07)	-0.001 (-0.21)	0.003 (0.17)

Results - Heterogeneity analysis, cont.

Variable	Ownership structure	Gatekeepers	Management characteristics
ABNCFO	0.011 (1.30)	-0.005 (-0.77)	0.004 (1.17)
ABNEXP	0.009 (1.33)	0.008 (0.94)	0.008* (1.79)
ABNPROD	-0.013* (-1.78)	0.001 (0.34)	-0.002 (-0.67)
ABNCFO&EXP	0.001 (0.05)	-0.001 (-0.10)	-0.014*** (-2.82)
ABNEXP&PROD	0.010* (1.81)	-0.001 (-0.07)	-0.006 (-1.34)
Other	0.025 (1.34)	0.012 (1.24)	0.004 (0.50)
No. of observations	0.013 (1.51)	-0.001 (-0.38)	-0.027*** (-4.58)
Average year	-0.001 (-0.17)	0.001 (0.51)	0.001 (0.18)
Peer-reviewed	-0.027** (-2.24)	-0.017 (-1.48)	-0.003 (-0.37)

Results - Heterogeneity analysis, cont.

Variable	Ownership structure	Gatekeepers	Management characteristics
SIZE	-0.005 (-0.36)	-0.009 (-1.32)	0.022 (0.81)
PROFIT	0.017*** (2.94)	0.005 (1.26)	-0.004 (-0.52)
LOSS	-0.015*** (-2.99)	0.001 (0.17)	-0.016 (-1.12)
LEVERAGE	0.005 (1.36)	-0.009** (-2.51)	0.015*** (3.07)
MTB	0.003 (0.68)	0.008* (1.68)	-0.001 (-0.11)
AEM	-0.005 (-0.98)	0.001 (0.06)	0.009** (2.05)
Fixed effects	0.008 (1.59)	-0.006 (-1.49)	0.013 (1.63)
Endogeneity	-0.001 (-0.37)	0.004 (1.57)	-0.001 (-0.02)
Robust errors	-0.003 (-0.62)	0.003 (0.79)	-0.018** (-2.51)
No. of observations	1641	2489	869
No. of studies	74	121	50

Summary & Discussion

- The results do not indicate a publication bias.
- We find for all three groups (ownership structure, gatekeepers, management characteristics) that the mean effect derived by meta-analysis is low (close to zero) and statistically insignificant.
- Using meta-regression analysis (MRA) and adding a wide set of moderators reveals the key drivers of the differences in the partial correlations between studies.
    - All variables referring to the measurement of ownership structure are statistically significant, meaning that certain types of ownership can differ in terms of REM mitigation.
    - For the most factors in the gatekeepers category, we do not find significant differences when compared with external audit quality (base category). The exception is analyst coverage.
    - For the management characteristics category, the only variable that showed a significant deviation from the base category (compensation) was CEO duality. Having the CEO in a dual role influences higher REM usage compared to the base category. Such an observation suggests entrenchment of managers, which is consistent with agency theory.

Summary & Discussion, cont.

- The study finds significant differences between world regions in the effect of corporate governance mechanisms on REM, which are found in the categories of ownership structure and management characteristics. Moreover, there is a weaker effect of shareholding structure on REM in common law countries. In addition, we find some aspects related to the methodology of the studies conducted, which make a vital contribution to explaining the heterogeneity of the results among which are variables referring to the measurement of REM, the inclusion of specific control variables, the number of observations in the primary studies and the quality of the publications.

Thank you for your attention!

Appendix

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Data collection and research sample

- Keywords: Earnings' management AND corporate governance
- Databases: Google Scholar, Science Direct, JSTOR, SSRN
- Inclusion criteria: 1) Study's focus is on REM, 2) Research question concerning factors influencing REM, 3) Contain quantitative research answering the research question
- Collected data: Partial correlations (PCCs), standard errors, 37 aspects of study design (moderator)
- Final sample overview:

	Ownership structure	**Gatekeepers**	**Management characteristics**
Studies (*k*)	74	121	50
Obs. (*n*)	1,641	2,489	869

Methodology

- Effect size (Stanley, T.D., Doucouliagos, H. 2012):

$$PCC_{ij} = t_{ij} / sqrt(t_{ij}^2 + df_{ij})$$

- Standard error: $SE(PCC_{ij}) = sqrt((1 - PCC_{ij}^2) / df_{ij})$

  where: PCC_{ij} - partial correlation coefficient of i-th estimation in j-th study t_{ij} - t-statistic of i-th estimation in j-th study, df_{ij} - degrees of freedom of i-th estimation in j-th study

- Three-step meta-regression:
  - Graphical analysis and mean effects via simple meta-averages
  - Publication bias analysis and correction (Egger's test)
  - Heterogeneity analysis

- Model specification: WLS meta-regression with standard errors clustered at the level of individual studies, alternative weights for WLS as robustness check, Bayesian Model Averaging

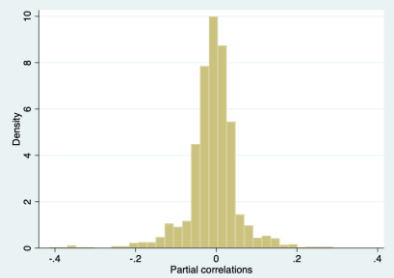
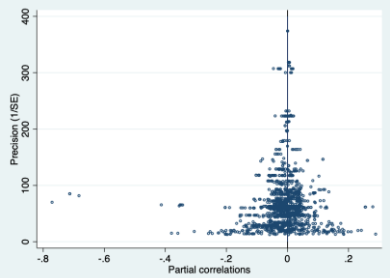
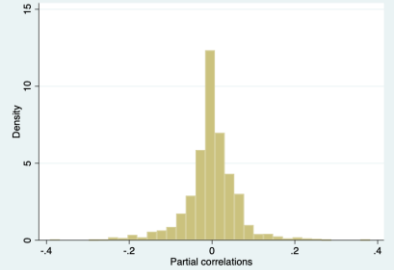
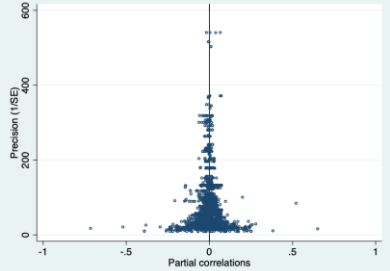
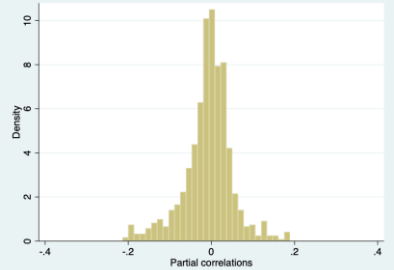
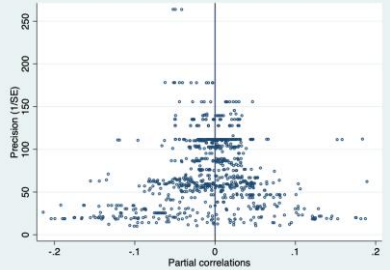
Research design

We consider the relationship between REM and CG in three areas: **ownership structure, gatekeepers and management characteristics.** A disaggregation of the three areas mentioned above will be performed with the use of moderators:

1. In the case of the the **OWNERSHIP STRUCTURE**, we take the variables describing the ownership structure into account (e.g. family ownership, institutional investors ownership).
2. In the case of the **MANAGEMENT CHARACTERISTICS**, we can distinguish variables such as the number of board members, board compensation, or professionalism of CEO.
3. The meta-variable **GATEKEEPERS** will be will be disaggregated into such variables like dummy variables describing whether firms use the international financial reporting standards or determining whether the company's auditor is a large audit firm; also a variable characterizing analysts following the firm.

Such an approach will make it possible to solve the problem of conflicting findings and to generalize the results (theory generating avenue, clarifying constructs, locating potential ambiguity around a construct and providing construct clarification in a way that extends theory) (Post et al, 2020).

Results - Graphical analysis

	Histogram	Funnel plot
Ownership structure		
Gatekeepers		
Management characteristics		

Results - Simple mean effects

Overall effects

Corporate governance category	No. of studies	No. of obs.	Mean PCC	95%-confidence bands
Ownership structure	74	1,641	**-0.010**	[-0.019; 0.001]
Gatekeepers	121	2,489	**-0.002**	[-0.008; 0.004]
Management characteristics	50	869	**-0.008**	[-0.016; 0.010]

Meta-averages of structural differences - **subgroups**

Corporate governance category	Regional moderators	No. of obs.	No. of studies	Mean PCC	95% conf. int.	
Ownership structure	NA	226	18	**-0.003**	-0.008	0.002
	ECA	275	11	**-0.006**	-0.013	0.006
	EAP	749	37	**-0.002**	-0.010	0.007
	Rest of the world	485	13	**-0.022**	-0.043	-0.002
Gatekeepers	NA	929	45	**-0.001**	-0.005	0.005
	ECA	443	24	**0.002**	-0.006	0.011
	EAP	1,064	53	**-0.001**	-0.011	0.078
	Rest of the world	405	22	**0.001**	-0.010	0.012
Management characteristics	NA	429	17	**-0.003**	-0.010	0.040
	ECA	42	7	**-0.021**	-0.049	0.080
	EAP	335	18	**-0.010**	-0.020	0.001
	Rest of the world	63	8	**0.030**	0.002	0.059