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

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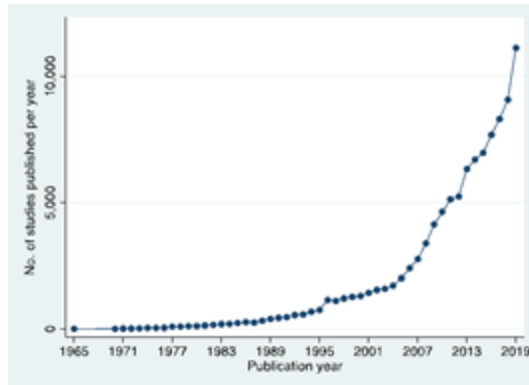
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Introduction to Meta-Analysis - Business & Finance

Exponential growth	Heterogeneity	Credibility

Number of Scopus search results between 1965 and 2019 for published articles in finance.
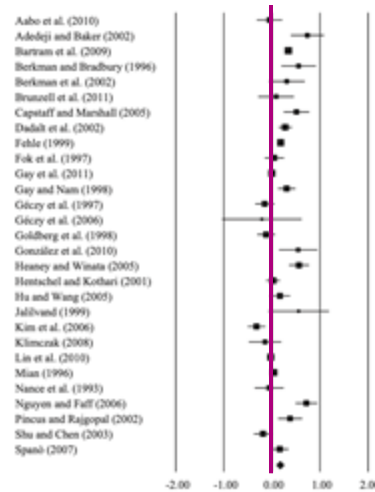
Forest plot of 29 studies on the impact of corporate leverage on corporate hedging (Arnold et al. 2014: 451).

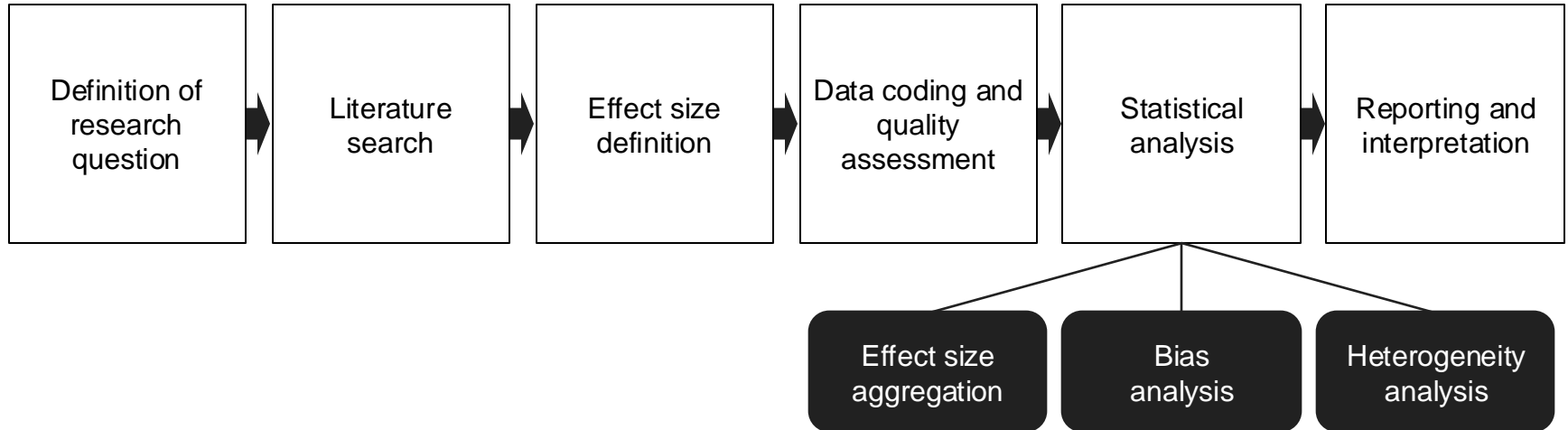...and this is where we put the non-significant results.

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)

Definition of research question → Literature search → Effect size definition → Data coding and quality assessment → Statistical analysis → Reporting and interpretation

Statistical analysis:
- Effect size aggregation
- Bias analysis
- Heterogeneity analysis

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
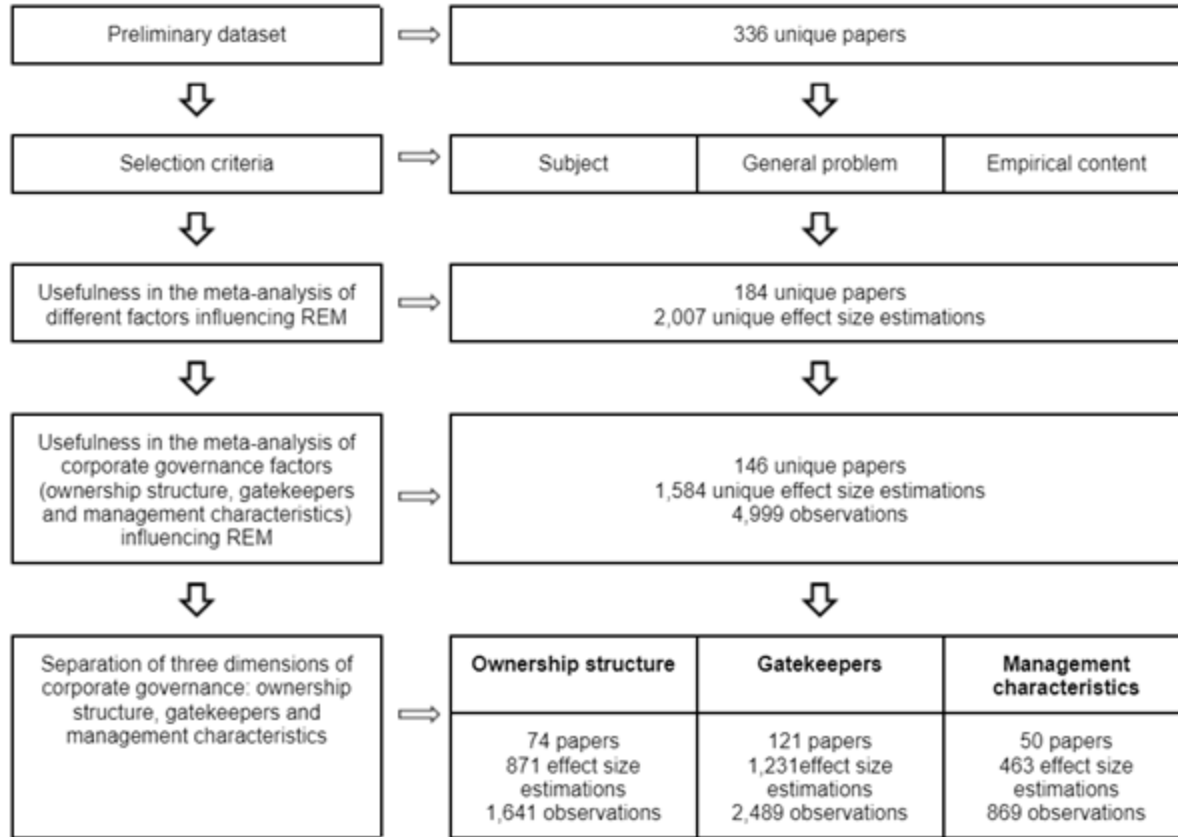
Theoretical background

- 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 Executive Officer 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

Preliminary dataset	⟹	336 unique papers		
⬇		⬇		
Selection criteria	⟹	Subject	General problem	Empirical content
⬇		⬇		
Usefulness in the meta-analysis of different factors influencing REM	⟹	184 unique papers 2,007 unique effect size estimations		
⬇		⬇		
Usefulness in the meta-analysis of corporate governance factors (ownership structure, gatekeepers and management characteristics) influencing REM	⟹	146 unique papers 1,584 unique effect size estimations 4,999 observations		
⬇		⬇		
Separation of three dimensions of corporate governance: ownership structure, gatekeepers and management characteristics	⟹	**Ownership structure**	**Gatekeepers**	**Management characteristics**
		74 papers 871 effect size estimations 1,641 observations	121 papers 1,231 effect size estimations 2,489 observations	50 papers 463 effect size estimations 869 observations

Data collection - Moderators

Ownership structure	Gatekeepers	Management characteristics	Measurement of REM	Controls & Model	Regional factors	Further aspects
Institutional ownership*	External audit quality*	Executives compensation*	REM * **	Control for size	North America*	Number of observations
Insider ownership	Board of directors activity	CEOs turnover	ABNPROD***	Control for profitability	Europe and Central Asia	Average year
Family ownership	Institutional framework	CEOs professionalism	ABNEXP***	Control for loss	East Asia and Pacific	Peer-reviewed
State ownership	Independence of board members	CEOs duality	ABNCFO***	Control for leverage	Rest of the world	
Other	Internal audit quality	Female presence in the board	ABNCFO&ABNEXP	Control for MTB	Common law system	
	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

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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

	(I) Inverse variance	(II) #Est. per study	(III) Inverse variance x #Est. per study	(IV) Fixed effects	(V) Between effects
Panel A: Ownership characteristics					
Publication bias	-0.430 (-1.50)	-0.430 (-1.09)	-0.070 (-0.29)	-0.270 (-0.29)	0.033 (0.08)
Effect beyond	-0.002 (-0.60	0.006 (0.087)	-0.001 (-0.41)	-0.004 (-0.28)	-0.003 (-0.65)
#Obs. #Studies	1,641 74				
Panel B: Gatekeepers					
Publication bias	-0.020 (-0.08)	-0.419 (-1.13)	0.122 (0.27)	-0.663** (-2.02)	0.151 (0.25)
Effect beyond	-0.002 (-0.60)	-0.009 (0.96)	-0.001 (-0.14)	0.006 (1.44)	-0.001 (-0.16)
#Obs. #Studies	2,489 121				
Panel C: Management characteristics					
Publication bias	0.001 (0.00)	-0.812** (-2.47)	0.592 (0.80)	0.493 (0.83)	0.428 (-1.20)
Effect beyond	-0.004 (-0.54)	0.014* (1.90)	-0.011 (-0.88)	-0.011 (-1.30)	-0.009 (-1.20)
#Obs. #Studies	869 51				

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

- Very small (almost 0!) aggregated effect of CG on REM

- No indication of considerable publication bias

- Mesurement of CG matters:
    - certain types of ownership can differ in terms of REM mitigation.
    - in the case of gatekeepers we do not find significant differences when compared with external audit quality except for analyst coverage
    - having the CEO in a dual role influences higher REM usage compared to the base category
- Some regional differences are present in the categories of ownership structure and management characteristics
- The methodology of the studies conducted makes a vital contribution to explaining the heterogeneity of the results: (1) the measurement of REM, (2) the inclusion of specific control variables, (3) the number of observations in the primary studies, and the quality of the publications.

Thank you for your attention!

Appendix

References

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Stanley, T.D., Doucouliagos, H. (2012) *Meta-Regression Analysis in Economics and Business*, Routledge.

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

  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).
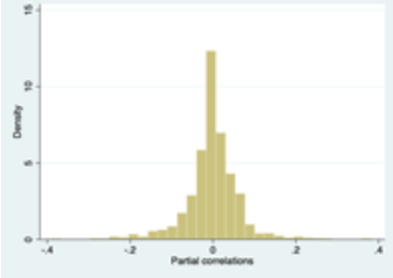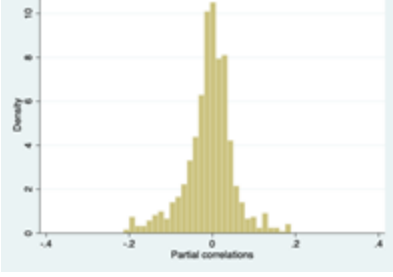
Results - Graphical analysis
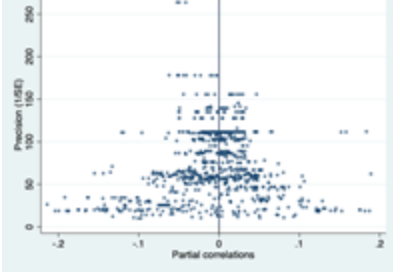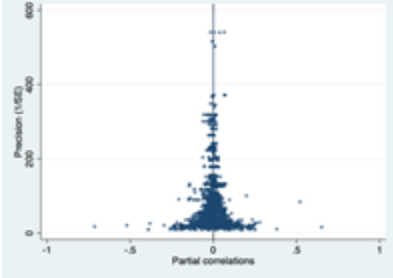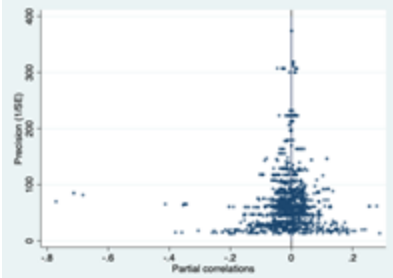
Histogram

Funnel plot
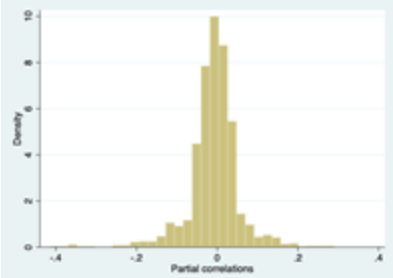
Ownership structure

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