Ownership Structure and Real Earnings Management Meta-Regression Analysis

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Motivation and research question

- What is earnings management (EM)?
- Why do 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)
  - Potential interest in our study would come from synthesizing research on REM in the context of ownership structure (OS)
  - The use of meta-analysis created an opportunity to apply a comprehensive approach and overcome the ambiguity of the results

Theoretical background

- Two theoretical frameworks are applied to explain the rationale for REM practices: **efficiency (signalling) theory** or **opportunistic (agency) theory** (Habib et al., 2022).

- Ownership structure is understood as the identity of owners which can influence their economic interests and decision-making process (Kumar & Zattoni, 2015):
  - Institutional ownership,
  - Family ownership,
  - Insider ownership.

- Substantial 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.

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Key issue and literature ambiguity

	Institutional ownership	Family ownership	Insider ownership
Positive impact on REM	In case of transient investors, the adoption of an exit policy accompanied by the lack of monitoring activities can encourage managers to utilize earnings manipulation hoping for short-term profit boosts and market mislead (Duggal & Millar, 1994; Njah & Jarboui, 2013)	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).	Managers and other insiders over-exercise their power to maximise private benefits, which could increase by earnings manipulation (Miguel et al., 2005; Teshima & Shuto, 2008)
Negative impact on REM	Dedicated or long-term-oriented investors perform their active monitoring activities (Njah & Jarboui, 2013), which can in return limit the processes of 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).	As insider ownership increases, there is less room for managerial misconduct, and consequently manipulation of REM activities decreases (Yang et al., 2008)

Meta-Analysis - Process

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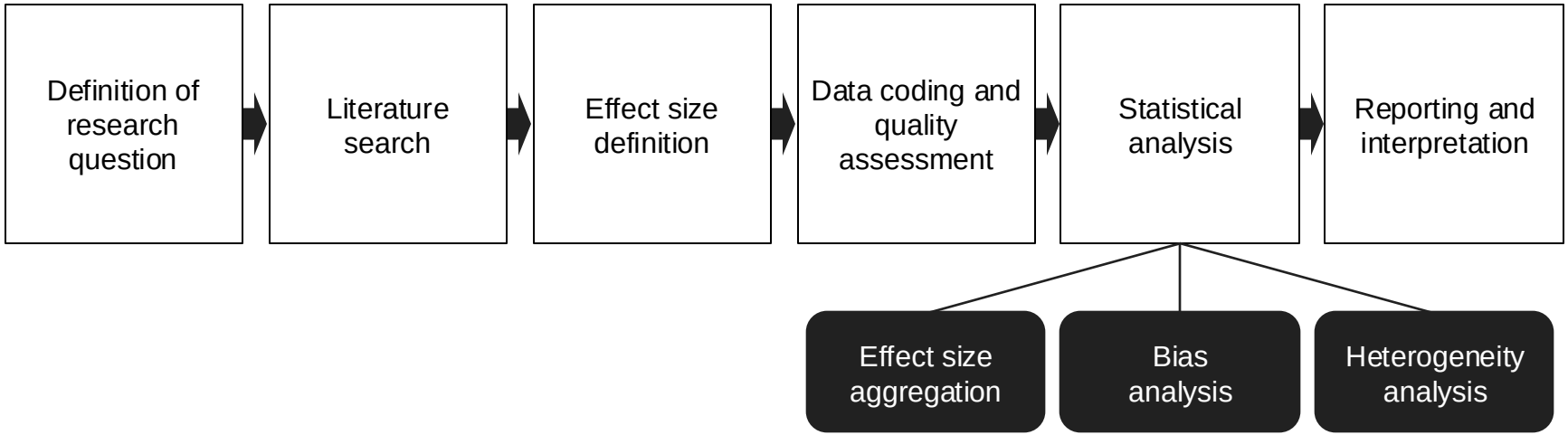
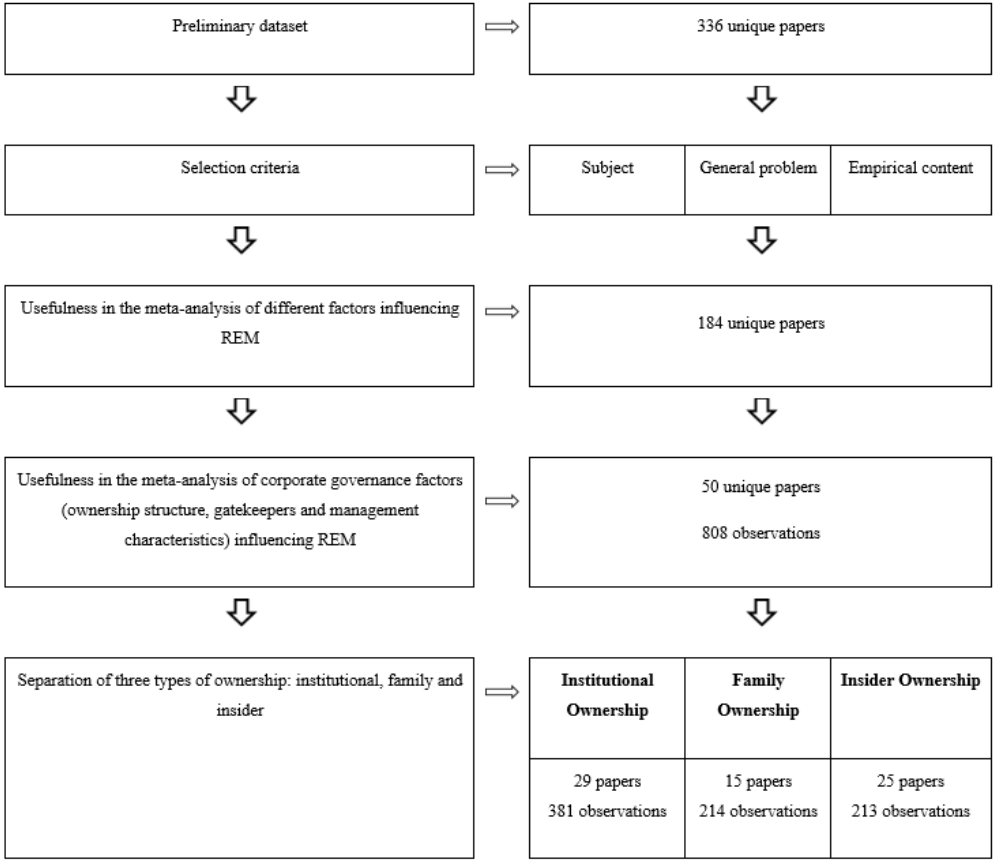
"Meta-analysis refers to the **analysis of analyses**. I use it to refer to the **statistical analysis** of a large collection of results from **individual studies** for the purpose of **integrating** the findings." (Glass, 1976: 3)



Data collection - Research sample



Variables

Differences in the regional origin of research samples	Cultural differences in regions of research samples	Differences in real earnings management measurement	Inclusion of important control variables	Methodological heterogeneity	Differences in macro variables	Differences in data and publication characteristics
NAM*	WESTERN*	y_REM* [1]	Control_Inst_Stability [4]	Regress_fixed_eff	Rule_of_Law_index	Publ_peerreview
ROW	CHINA	y_2d [2]	Control_Concentration	Regress_endogeneity	Ln_macro_GDP_per_c	Ln_publ_citstudy
	OTHER	y_1d [3]	Control_profit	Regress_robust		Ln(est_noobserv)
			Control_mtb			Sample_av_year
			Control_AEM			Var_focus

Notes: *indicates a base category in MRA; [1] y_REM includes all three dimentions if REM and is a sum of ABNPROD, ABNEXP and ABNCFO; [2] y_2d is a variable capturing the combination of two dimensions of real earnings management; [3] y_1d is a variable capturing only one dimention of REM; [4]Control_Inst_Stability was used only in examining the raltionship between REM and institutional ownership

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) Institutional Ownership	(2) Family Ownership	(3) Insider Ownership
Bias ($\widehat{\beta}_1$)	-1.070** (-2.08)	-0.149 (-0.22)	-0.122 (-0.29)
Mean effect ($\widehat{\beta}_0$)	-0.006 (-0.98)	0.011 (0.81)	-0.008*** (-3.28)

Notes: This table shows the results of the publication bias test by estimating the basic MRA equation. $\widehat{\beta_1}$ *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.*

Heterogeneity analysis – INSTITUTIONAL ownership (1)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Bias ($\widehat{\beta}_1$)	1.231** (2.50)	2.334*** (3.32)	2.444** (2.39)	1.236** (2.39)	2.325*** (3.24)	2.440** (2.39)
Mean effect ($\widehat{\beta}_0$)	3.68 (0.84)	2.28 (0.67)	2.15 (0.45)	3.68 (3,68)	2.38 (0.67)	2.12 (0.44)
Control_Concentration	-0.029 (-1.63)	**-0.031*** **(-1.80)**	-0.030 (-1.62)	-0.029 (-1.63)	**-0.031*** **(-1.80)**	-0.030 (-1.59)
Control_Inst_Stability	0.004 (0.34)	-0.002 (-0.17)	-0.001 (-0.10)	0.004 (0.38)	-0.002 (-0.20)	-0.002 (-0.11)
Var_Focus	-0.008 (-0.72)	0.005 (0.38)	0.004 (0.30)	-0.008 (-1.00)	0.005 (0.48)	0.005 (0.38)
Sample_ROW	0.015 (1.00)	-	-0.005 (-0.15)	0.015 (1.04)	-	-0.006 (-0.15)
Rule_of_Law_Index	0.000 (0.04)	-0.001 (-0.09)	-0.001 (-0.12)	-	-	-
Regress_fixed_eff	-0.009 (-0.99)	-0.012 (-1.45)	-0.013 (-1.47)	-0.009 (-1.07)	-0.012 (-1.60)	-0.012 (-1.47)
Regress_endogeneity	0.012 (1.50)	**0.018**** **(2.17)**	**0.018**** **(2.13)**	0.012 (1.52)	**0.018**** **(2.18)**	**0.018**** **(2.10)**
Regress_robust	-0.006 (-0.79)	-0.004 (-0.51)	-0.004 (-0.53)	-0.006 (-0.76)	-0.004 (-0.62)	-0.005 (-0.64)
Ln_est_noobserv	**0.011***** **(2.75)**	**0.016***** **(3.58)**	**0.017***** **(2.80)**	**0.011***** **(2.94)**	**0.016***** **(3.64)**	**0.017***** **(2.89)**
Sample_av_year	-0.002 (-0.88)	-0.001 (-0.74)	-0.001 (-0.50)	-0.002 (-0.87)	-0.001 (-0.73)	-0.001 (-0.48)

Notes: All models are 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.

Heterogeneity analysis – INSTITUTIONAL ownership (2)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Control_profit	0.005 (0.53)	-0.001 (-0.15)	-0.002 (-0.17)	0.005 (0.55)	-0.001 (-0.16)	-0.002 (-0.20)
Control_mtb	0.005 (0.55)	0.004 (0.39)	0.004 (0.37)	0.005 (0.66)	0.004 (0.54)	0.004 (0.55)
Control_aem	-0.002 (-0.33)	-0.003 (-0.44)	-0.003 (-0.42)	-0.002 (-0.32)	-0.003 (-0.43)	-0.003 (-0.41)
y_2d	0.005 (0.63)	0.001 (0.10)	0.000 (0.04)	0.005 (0.63)	0.001 (0.10)	0.000 (0.04)
y_1d	**0.008** **(2.06)**	**0.007*** **(1.81)**	**0.007*** **(1.90)**	**0.008**** **(2.07)**	**0.007*** **(1.82)**	**0.007*** **(1.94)**
Publ_peerreview	0.011 (0.35)	0.019 (0.75)	0.019 (0.65)	0.011 (0.36)	0.020 (0.80)	0.019 (0.68)
Ln_publ_citstudy	0.002 (0.25)	0.003 (0.52)	0.003 (0.45)	0.002 (0.26)	0.003 (0.54)	0.003 (0.45)
China		0.017 (1.45)	0.022 (0.78)		0.017 (1.55)	0.023 (0.71)
Other		-0.011 (-0.75)	-0.007 (-0.26)		-0.011 (-0.79)	-0.006 (-0.20)
Ln_macro_GDP_per_c				0.000 (0.04)	-0.000 (-0.09)	-0.001 (-0.14)

Notes: All models are 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.

Heterogeneity analysis – FAMILY ownership (1)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Bias ($\widehat{\beta}_1$)	1.972 (0.65)	2.626 (0.73)	3.087 (0.91)	2.038 (0.46)	2.179 (0.55)	2.756 (0.74)
Mean effect ($\widehat{\beta}_0$)	13.305** (2.22)	4.343 (1.39)	7.250*** (2.93)	13.043*** (2.76)	5.453** (2.47)	8.036*** (3.11)
Control_Concentration	-0.006 (-0.23)	-0.001 (-0.05)	-0.012 (-0.53)	-0.007 (-0.33)	0.007 (0.32)	-0.003 (-0.13)
Var_Focus	0.033 (0.98)	0.080 (1.14)	0.105 (1.56)	0.035 (1.30)	-0.027 (-0.69)	-0.039 (-1.13)
Var_Dummy	0.004 (0.72)	-0.001 (-0.21)	-0.002 (-0.51)	0.004 (1.02)	-0.001 (-0.13)	-0.002 (-0.45)
Sample_ROW	-0.011 (-0.42)		**-0.067** **(-2.08)**	**-0.009*** **(-2.65)**		**-0.069**** **(-1.99)**
Rule_of_Law_Index	-0.001 (-0.07)	0.062 (1.64)	**0.082**** **(2.15)**			
Regress_fixed_eff	-0.009 (-0.66)	-0.005 (-0.47)	0.004 (0.43)	-0.009 (-0.68)	-0.006 (-0.52)	0.003 (0.33)
Regress_endogeneity	**0.033*** **(2.73)**	**0.050*** **(5.14)**	**0.038*** **(3.31)**	**0.033*** **(3.27)**	**0.049*** **(5.03)**	**0.037*** **(3.08)**
Regress_robust	-0.032 (-1.39)	**-0.056*** **(-4.42)**	**-0.042*** **(-3.09)**	**-0.032*** **(-1.73)**	**-0.050*** **(-3.83)**	**-0.035**** **(-2.38)**
Ln_est_noobserv	0.030 (0.99)	0.029 (0.90)	0.024 (0.81)	0.030 (0.78)	0.027 (0.79)	0.022 (0.71)
Sample_av_year	**-0.007**** **(-2.25)**	-0.002 (-1.53)	**-0.004*** **(-3.07)**	**-0.007*** **(-2.78)**	**-0.003*** **(-2.71)**	**-0.004*** **(-3.35)**

Notes: All models are 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.

Heterogeneity analysis – FAMILY ownership (2)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Control_profit	0.026 (1.48)	0.026* (1.69)	0.024 (1.40)	0.027 (1.61)	0.020 (1.48)	0.018 (1.18)
Control_mtb	-0.005 (-0.31)	**-0.027**** **(-2.06)**	**-0.026**** **(-2.33)**	-0.006 (-0.35)	**-0.022*** **(-1.83)**	**-0.020*** **(-1.91)**
Control_aem	**-0.064***** **(-3.21)**	**-0.085***** **(-6.41)**	**-0.107***** **(-4.24)**	**-0.065***** **(-4.87)**	**-0.084***** **(-5.58)**	**-0.111***** **(-3.29)**
y_2d	-0.002 (-0.25)	0.002 (0.22)	0.006 (0.47)	-0.002 (-0.24)	0.001 (0.13)	0.006 (0.42)
y_1d	0.007 (0.65)	0.008 (0.74)	0.011 (0.97)	0.007 (0.68)	0.008 (0.76)	0.012 (0.99)
Publ_peerreview	**0.095**** **(2.32)**	0.023 (0.45)	-0.041 (-0.71)	**0.097**** **(2.30)**	0.014 (0.30)	-0.056 (-0.96)
Ln_publ_citstudy	-0.004 (-0.73)	0.012 (1.49)	0.021** (2.48)	-0.004 (-0.66)	0.012 (1.47)	0.022** (2.37)
China		0.126 (1.55)	**0.233**** **(2.44)**		-0.005 (-0.98)	**0.061*** **(1.78)**
Other		**0.116***** **(2.60)**	**0.200***** **(3.05)**		**0.061***** **(2.69)**	**0.134***** **(2.59)**
Ln_macro_GDP_per_c				0.000 (0.02)	0.020 (1.13)	0.031 (1.55)

Notes: All models are 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.

Heterogeneity analysis – INSIDER ownership (1)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Bias ($\widehat{\beta}_1$)	1.883* (1.69)	2.467 (1.33)	2.548 (1.38)	2.042* (1.70)	2.826* (1.71)	2.649 (1.53)
Mean effect ($\widehat{\beta}_0$)	-6.420*** (-2.63)	-4.984* (-1.89)	-7.452*** (-3.06)	-6.646*** (-2.85)	-5.265** (-2.28)	-6.546*** (-3.19)
Control_Concentration	**0.020**** **(2.52)**	0.011 (0.62)	0.014 (0.89)	**0.018*** **(1.89)**	0.009 (0.57)	0.013 (0.85)
Var_Focus	**-0.053***** **(-4.11)**	**-0.046**** **(-2.17)**	**-0.049**** **(-2.35)**	**-0.046**** **(-2.41)**	**-0.035**** **(-2.16)**	**-0.042**** **(-2.06)**
Var_Dummy	-0.026 (-1.51)	-0.033 (-1.60)	**-0.037**** **(-2.01)**	-0.032 (-1.60)	**-0.045***** **(-2.64)**	**-0.041**** **(-2.53)**
Sample_ROW	-0.014 (-1.49)		**-0.024**** **(-2.36)**	-0.011 (-0.78)		-0.016 (-1.37)
Rule_of_Law_Index	-0.001 (-0.12)	0.006 (0.42)	0.009 (0.76)			
Regress_fixed_eff	**-0.012**** **(-2.06)**	**-0.012*** **(-1.76)**	-0.009 (-1.19)	**-0.013**** **(-2.29)**	**-0.011*** **(-1.67)**	-0.009 (-1.25)
Regress_endogeneity	-0.011 (-1.58)	-0.010 (-1.40)	-0.006 (-0.65)	-0.013* (-1.69)	-0.009 (-1.33)	-0.006 (-0.71)
Regress_robust	0.005 (0.71)	0.019 (1.04)	0.012 (0.71)	0.008 (0.74)	0.023 (1.61)	0.015 (0.93)
Ln_est_noobserv	**0.015**** **(2.21)**	**0.018**** **(2.05)**	**0.019**** **(2.31)**	**0.016**** **(2.30)**	**0.020***** **(2.79)**	**0.020***** **(2.61)**
Sample_av_year	**0.003***** **(2.59)**	**0.002*** **(1.85)**	**0.004***** **(3.02)**	**0.003***** **(2.77)**	**0.002**** **(2.13)**	**0.003***** **(2.98)**

Notes: All models are 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.

Heterogeneity analysis – INSIDER ownership (2)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Control_profit	**0.036*** (3.94)**	**0.040*** (3.10)**	**0.049*** (3.65)**	**0.035*** (3.70)**	**0.045*** (3.69)**	**0.049*** (4.01)**
Control_mtb	**0.018* (1.92)**	0.016 (1.40)	0.009 (0.84)	0.015 (1.51)	0.009 (1.02)	0.008 (0.94)
Control_aem	0.011 (1.32)	0.008 (0.83)	0.010 (1.09)	0.008 (0.78)	0.005 (0.61)	0.008 (0.96)
y_2d	-0.003 (-0.88)	-0.003 (-0.74)	-0.001 (-0.52)	-0.002 (-0.69)	0.000 (0.15)	-0.000 (-0.03)
y_1d	-0.002 (-1.06)	0.000 (0.13)	0.000 (0.03)	-0.001 (-0.67)	0.002 (0.56)	0.001 (0.32)
Publ_peerreview	-0.029* (-1.88)	-0.022 (-0.89)	-0.032 (-1.29)	-0.020 (-0.87)	-0.012 (-0.62)	-0.025 (-0.96)
Ln_publ_citstudy	-0.000 (-0.11)	0.000 (0.07)	0.002 (0.41)	-0.001 (-0.34)	-0.000 (-0.01)	0.001 (0.26)
China		0.018 (1.02)	**0.033* (1.77)**		**0.031** (2.42)**	**0.035** (2.49)**
Other		0.005 (0.16)	0.028 (0.83)		0.031 (1.01)	0.040 (1.29)
Ln_macro_GDP_per_c				0.004 (0.39)	**0.016** (1.97)**	0.013 (1.34)

Notes: All models are 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.

Summary & Discussion

- The statistically significant publication bias was reported in the case of institutional ownership which according to Stanley and Doucouliagos standards was substantial (2012). There was no significant tendency to obtain biased results in the case of family and insider ownership.

- There were no genuine effects beyond the publication selection bias in the case of institutional and family ownership. In the case of insider ownership, a significant mean effect was reported, nevertheless, it was not significant from the economic point of view.

- Using an augmented meta-regression model and adding a wide set of moderators reveals the key drivers of the differences in the partial correlations between studies.
  - Controlling for ownership concentration seems to have an occasional impact on reported results increasing the mitigating power of institutional investors and insiders
  - The impact of institutional ownership on REM does not depend on geographic region or cultural affiliation
  - The role of family and insider ownership in reducing REM practices is rather greater in Western culture when compared to China and others
  - Neither rules of law nor macroeconomic variables have a significant impact on the differentiation of results across all ownership types

Summary & Discussion, cont.

- In most of the cases examined, the quality of the journal (peer-reviewed publications or not) was unlikely to differentiate the results.
- Concerning family ownership, the mitigating effect of control over accrual-based earnings management is noted.

- The meta-regression method used as part of a comprehensive approach allowed us to identify insider ownership as the type of ownership that is negatively related to REM practices
- The obtained results can be interpreted in the light of agency theory and reject the concept of social-emotional wealth (SEW)

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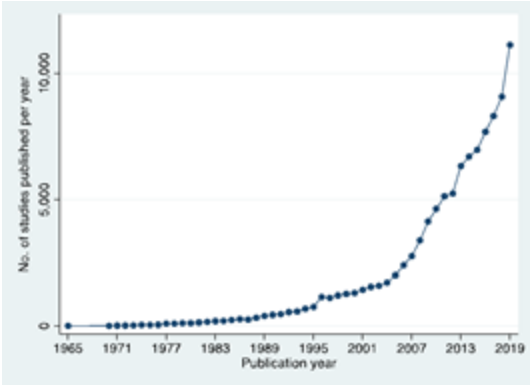
Thank you for your attention!

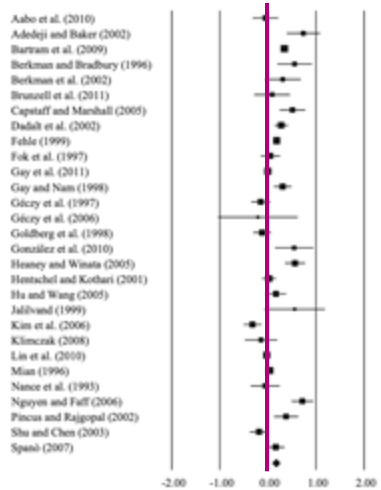
Appendix

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/

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