House Price Booms and Policy Choices: Insights from a Meta-Regression Study

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Introduction

Literature search

Application of the "Greedy Algorithm"

Can macroprudential tame housing market booms?

Conclusions

Three Meta Studies on Macroprudential Policy

Study	Focus	Data Scope	Key Findings
Araujo et al. (2024)	Broad macroprudential policies		• Tightening policies significantly reduce credit (with heterogeneity across instruments) **• Weaker, less precise effects on house prices** • Stronger impacts in emerging markets & micro-data samples • Evidence of leakages & spillovers • Tightening has larger effects than loosening • Near-term negative impact on economic activity
Malovaná et al. (2025)	Borrower-based measures (LTV, DTI, DSTI)	700+ estimates (34 studies)	• Publication bias present• After correction, borrower-based tightening reduces credit growth by –0.6 to –1.1 pp
Malovaná et al. (2024)	Bank capital regulation	~1,600 estimates (46 papers)	• Higher capital ratios → lending declines (~0.7 pp), with variation by framework & method

Typical search syntax used for meta-studies

Araujo et al. (2020):
"Effectiveness of macroprudential policies" [also replacing "effectiveness" with "effect" and "impact"

Malovaná et al. (2022):
"LTV" OR "LTI" OR "DSTI" OR "DTI" OR "borrower-based" OR "loan-to-value" OR "loan-to-income" OR "debt-service-to-income" OR "debt-to-income" AND "lending" OR "credit" "loans"

Malovaná et al. (2023):
"bank capital regulation" OR "capital requirements" OR "bank capital" OR "capitalsurplus" OR "capital ratio" OR "macroprudential regulation" OR "macroprudential policy" AND "lending" OR "credit" OR "loans"

Subsequent screening considered 300-500 studies, but how many hits did Google Scholar produce?

Search Strategy

Start with studies identified by earlier meta-researchers

Forward and backward additions:
  i) Replace unpublished with published versions
  ii) Unpublished versions may still have marginal information content

Use this preliminary set of studies to find a well-defined search query, aimed at building as complete, and unbiassed, a data set as possible
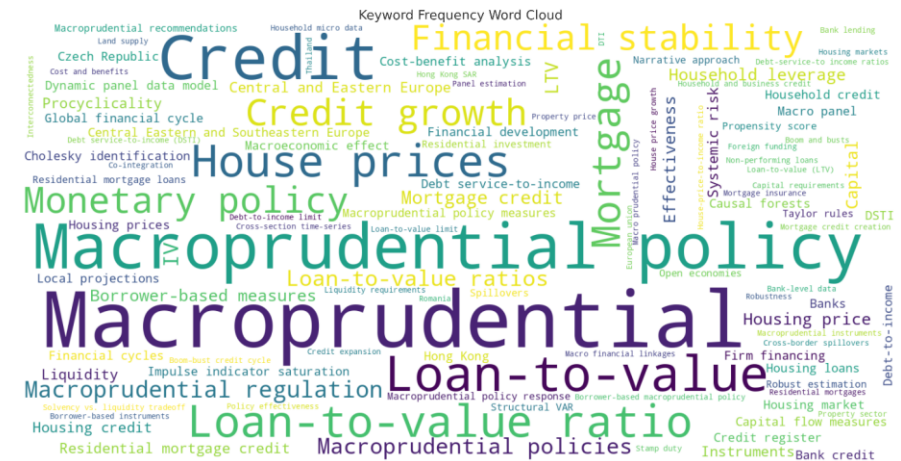
Triage with a Study Relevance Index (SRI) and a Data Extraction Complexity Index (DECI)

- **Screening Studies for Meta-Regression: Metadata Collection Prompt**

- **Purpose**: Systematically evaluates whether an empirical study qualifies for inclusion in a meta-analysis of macroprudential policy effects on housing markets and credit growth.

- **Two-Index Approach**:
  - **Study Relevance Index (0–10)** assesses conceptual fit and empirical quality (e.g., coverage of house prices or credit, use of macroprudential instruments, computability of effect sizes).
  - **Data Extraction Complexity Index (0–10)** estimates the difficulty of extracting usable metadata, based on reporting standards, transformations, and interaction terms.

- **Structured Scoring Logic**: Applies weighted criteria to ensure transparent, consistent triage — filtering out non-eligible studies early ("deal-breaker") and ranking eligible studies by relevance and data extraction difficulty.

- **Practical Output**: Generates two Excel-ready summary tables for relevance and complexity, with notes to flag missing statistics or methodological complications — streamlining inclusion decisions and downstream coding.

Version Comparison Index

- **Comparing Study Versions for Meta-Study Inclusion**

- **Purpose**: Evaluates whether to include both versions of a study (typically a working paper and its later published form) in a meta-analysis, or just one, based on methodological and empirical overlap.

- **Method**: Scores similarity across six weighted criteria — methodology, sample period, country/firms coverage, empirical results, and other differences — using a 1–10 scale and brief justifications.

- **Decision Rule**: Calculates a weighted average similarity score to guide inclusion:
    - 9–10: near duplicates → include one
    - 7–8.9: strong overlap → include one
    - 5–6.9: moderate similarity → consider both
    - <5: materially different → include both

- **Output**: Provides an Excel-compatible summary table with raw scores, overall similarity, and a recommendation on inclusion for meta-analysis.

Titles and Keywords provide complementary searching information

Titles emphasise empirical approach to assessing effectiveness

Keywords emphasise the objectives of policy action

- **A ChatGPT Prompt for Categorising Keywords from Abstracts of Empirical Studies on Macroprudential Policy**

  - **Purpose**: Supports a structured thematic analysis of the language used in empirical studies evaluating the effectiveness of macroprudential tools on financial stability outcomes.
  - **Function**: Classifies each keyword into one of nine predefined categories (e.g. policy instruments, objectives, methods) using semantic inference, stemming, and fuzzy logic to ensure consistent, Excel-compatible labelling.
  - **Output**: A fully populated classification table with explanatory notes where appropriate — not just a template. Each keyword is assigned to one and only one category, even if an exact match is absent.
  - **Application**: Enables quantitative content analysis of research trends, facilitates synthesis across studies, and improves transparency in literature review processes.

Literature search

Category #	Category	Sub-category	Examples	Category #	Category	Sub-category	Examples
1	Macroprudential Policy	A. General	macroprudential tools, regulation	5	Region/Country	A. General	emerging markets, open economies
		B. Specific	LTV, DTI, CCyB, reserve requirements			B. Specific	Hong Kong, EU, Central Eastern Europe
2	Policy Objective	A. General	financial stability, systemic risk	6	Monetary Policy	—	interest rates, Taylor rules
		B. Specific	credit growth, house prices	7	Other Relevant	—	tax, foreign funding, land supply
3	Effectiveness	A. General	cost-benefit analysis	8	Stopwords	—	the, and, of
		B. Specific	impact, elasticity, macroeconomic effect	9	Dates/Numbers	—	2023, 10%, 5 years
4	Empirical Study	A. General	data, narrative approach				
		B. Unit of Analysis	banks, households				
		C. Data Type	microdata, credit register				
		D. Methodology	OLS, IV, panel VAR, local projections				

Optimising Literature Search

How the Greedy Algorithm works:

Solves problems step-by-step by always picking what looks best **right now**
Doesn't look ahead or go back — makes one choice at a time and sticks with it
Works well when **small good choices lead to the best overall result**
Used in tasks like:
    Finding the shortest route (e.g. GPS navigation without delays)
    Building efficient networks (e.g. connecting computers with minimal cable)
    Compressing files (e.g. choosing shorter codes for common letters)

Fast and simple — but not always guaranteed to find the best solution

See Chvátal, V. (1979), "A Greedy Heuristic for the Set-Covering Problem", Mathematics of Operations Research 4(3):233-235.

Four runs of the algorithm: focus is on the marginal information content of each word

Macroprudential Terms	Credit & Lending Terms	Effect/Outcome Terms	Other Contextual Terms
Macroprudential policy (40)	Credit growth (21)	Effect (54)	Evidence (22)
Macroprudential policies (11)	Household credit (8)	Impact (6)	Banks (13)
Loan-to-value ratio (4)	Mortgage lending (2)	Affect (3)	Economies (8)
Borrower-based measures (4)	Housing loans (2)		Experience (2)
Macroprudential instruments (1)	Household leverage (1)		Credit register (2)
Macroprudential measures (2)			Cholesky identification (2)
Macroprudential tool (1)			Estimating (2)
			Causal forests (2)
			Co-integration (1)
			Household micro data (1)

Two out of four runs find all 63 papers, and the ones that didn't had good reasons

| #	Search Query	Hits	Coverage
1	Macroprudential Policy – Best Search	63	100%
2	Macroprudential Policy Objective – Best Search	59	93.7%
3	Macroprudential Policy Effectiveness – Best Search	63	100%
4	Empirical Study – Best Search	55	87.3%
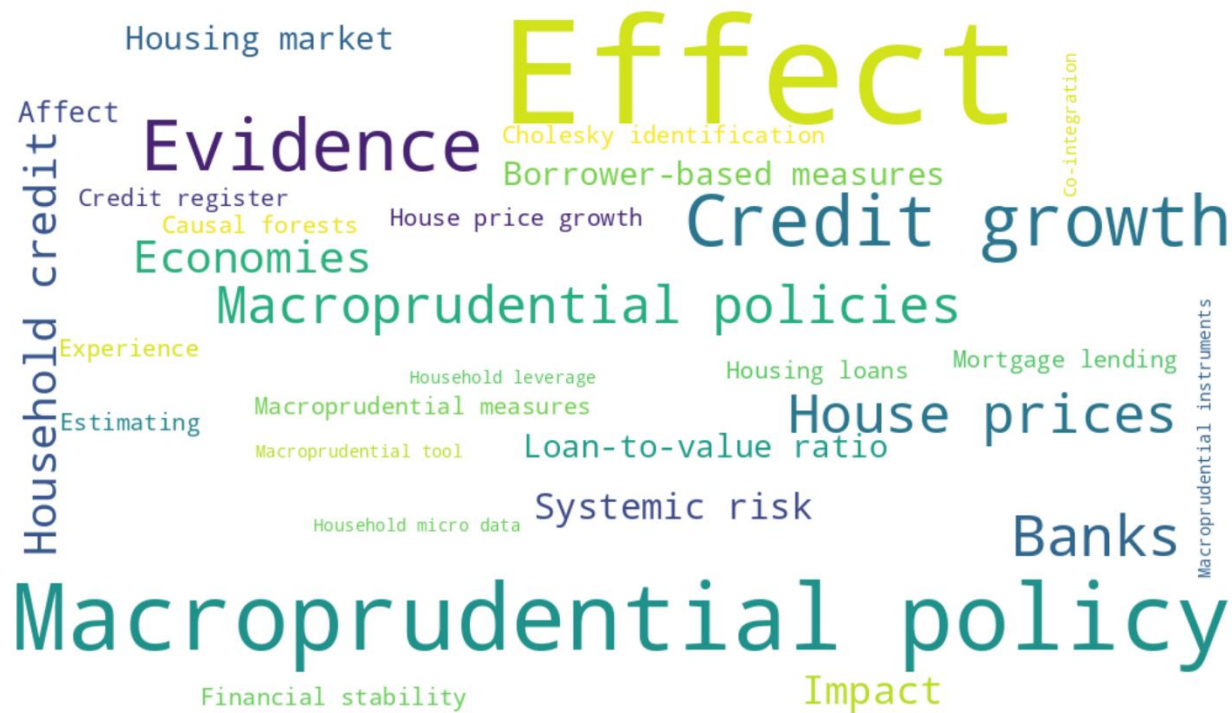
Why all the bother?

- **Google Scholar version:**
("Macroprudential policy" OR "Macroprudential policies" OR "Loan-to-value ratio" OR "Borrower-based measures" OR "Macroprudential measures" OR "Macroprudential tool" OR "Macroprudential instruments") AND ("Credit growth" OR "House prices" OR "Household credit" OR "Systemic risk" OR "Housing market" OR "House price growth" OR "Financial stability" OR "Mortgage lending" OR "Housing loans" OR "Household leverage") AND ("Effect" OR "Impact" OR "Affect") AND ("Evidence" OR "Banks" OR "Economies" OR "Experience" OR "Credit register" OR "Cholesky identification" OR "Estimating" OR "Causal forests" OR "Co-integration" OR "Household micro data") = 17,000+ Hits

- **Web of Science**
TS=("Macroprudential policy" OR "Macroprudential policies" OR "Loan-to-value ratio" OR "Borrower-based measures" OR "Macroprudential measures" OR "Macroprudential tool" OR "Macroprudential instruments") AND TS=("Credit growth" OR "House prices" OR "Household credit" OR "Systemic risk" OR "Housing market" OR "House price growth" OR "Financial stability" OR "Mortgage lending" OR "Housing loans" OR "Household leverage") AND TS=("Effect" OR "Impact" OR "Affect") AND TS=("Evidence" OR "Banks" OR "Economies" OR "Experience" OR "Credit register" OR "Cholesky identification" OR "Estimating" OR "Causal forests" OR "Co-integration" OR "Household micro data") = 226 Hits

Can macroprudential tame housing market booms?

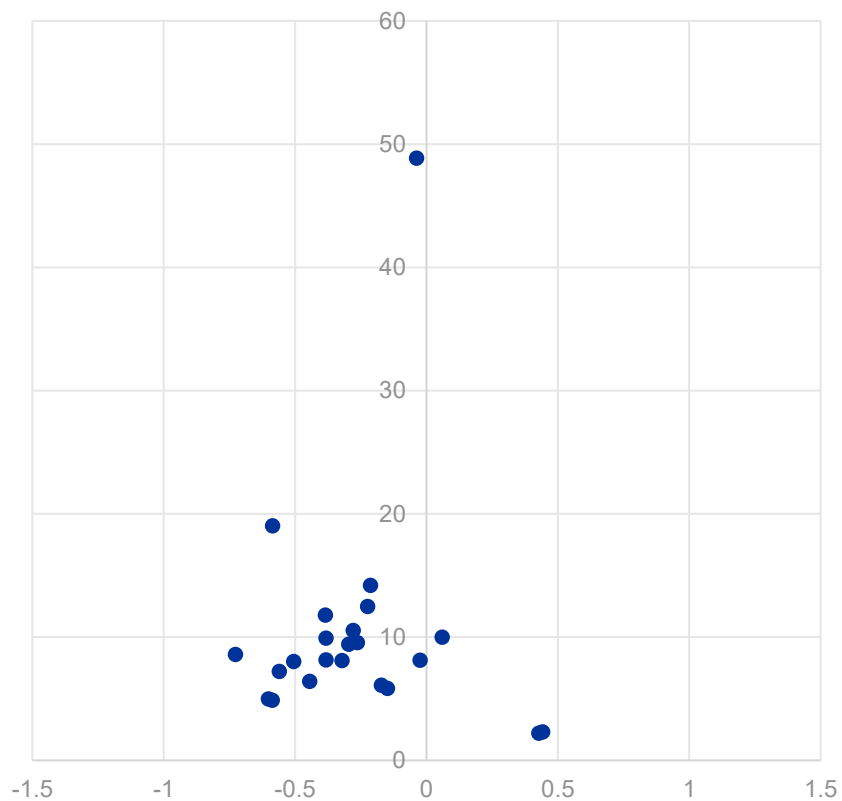### Standardised Effect (-0.12) of LTV on Household Credit Growth
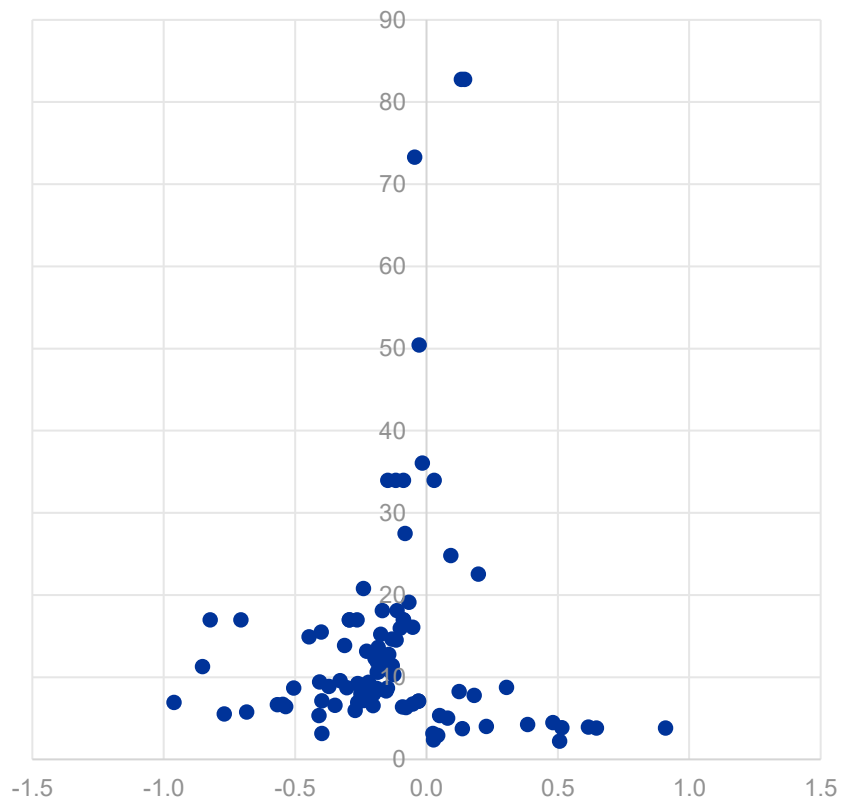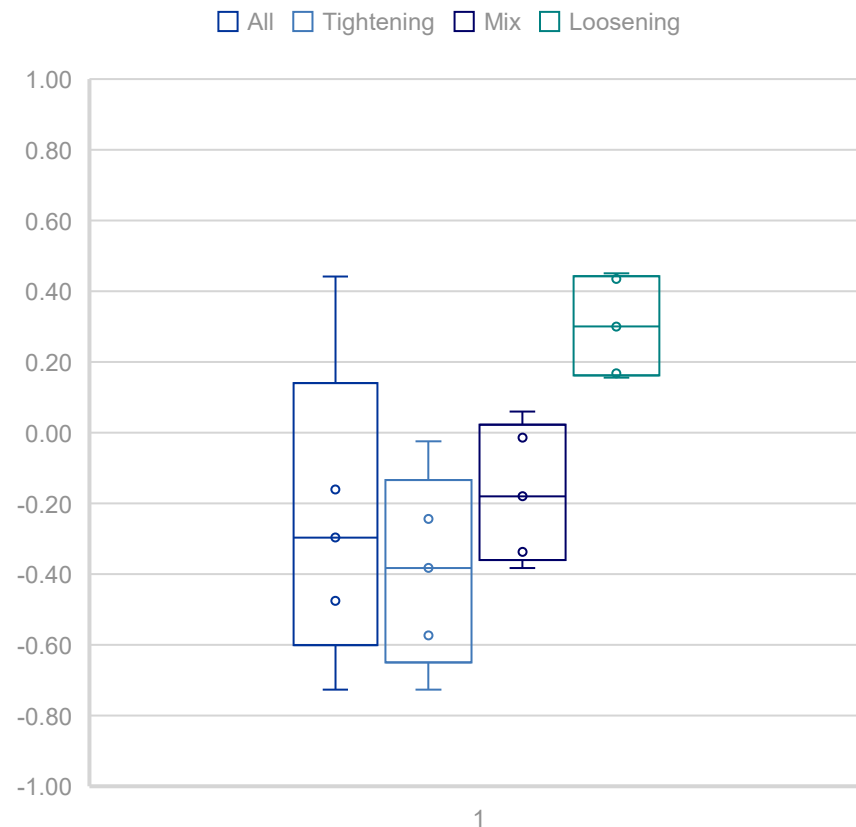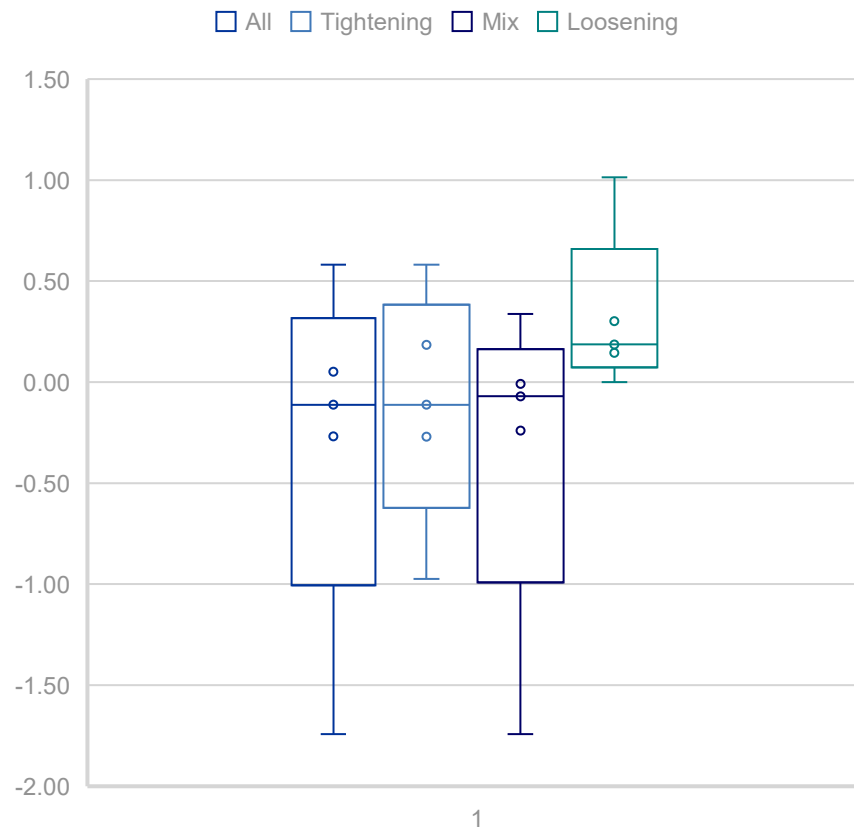

Standardised Effect of LTV on Household Credit

Legend: All, Tightening, Mix, Loosening

Standardised Effect (-0.27) of DSTI on Household Credit Growth

Standardised Effect of DSTI on Household Credit

Standardised Effect (-0.10) of DSTI on House Price Growth

Standardised Effect of DSTI on House Prices

All   Tightening   Mix   Loosening
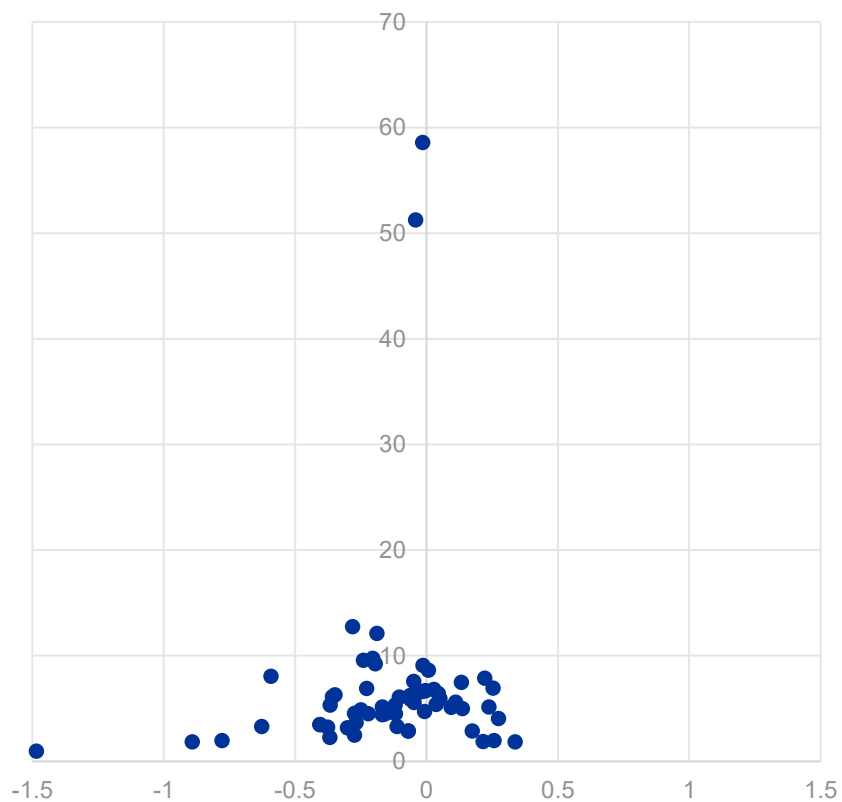
Conclusions

"A critical feature of this search is that it should be as comprehensive as possible", Stanley and Doucouliagos (2012)

- The search step in meta-regression analysis could be prone to bias if it relies on Google Scholar

- Many meta-regression practitioners add a further step of so-called "snowballing" but there is a more efficient way to be as comprehensive as possible

- A greedy literature search algorithm also ensures that meta-regression analyses are replicable