

LANGUAGE TRENDS IN PUBLIC ECONOMICS

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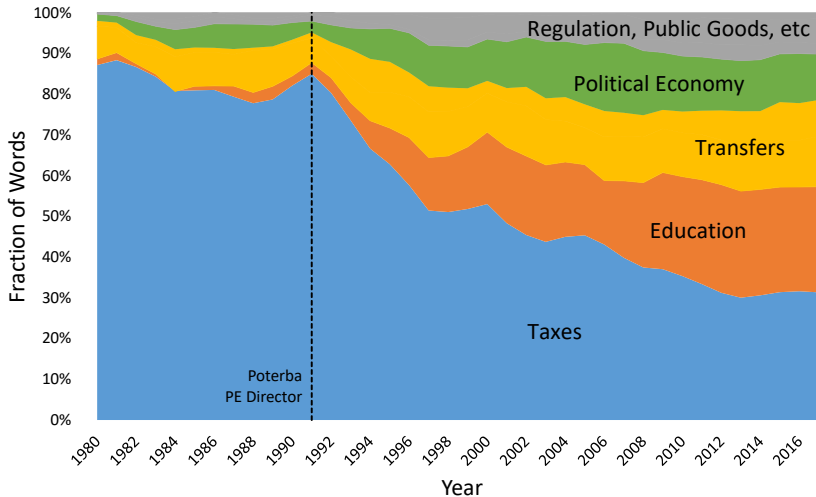
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What Are We Talking About In Public Economics?

- ▶ Understanding “new directions in research” based on word and language trends
- ▶ Textual analysis of public economics papers since 1975
 - ▶ **NBER** working papers
 - ▶ Focus on **PE-tagged** papers (4676 papers)
 - ▶ Analyze **full texts**
- ▶ Caveat: NBER is a selected sample of the profession, and the nature of the selection has changed over time

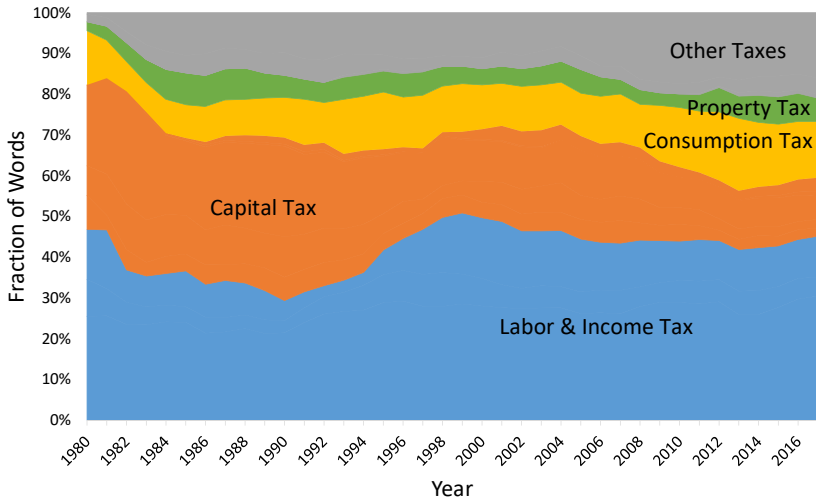
Broad Themes

We Talk Less About Taxes Than We Used To Do



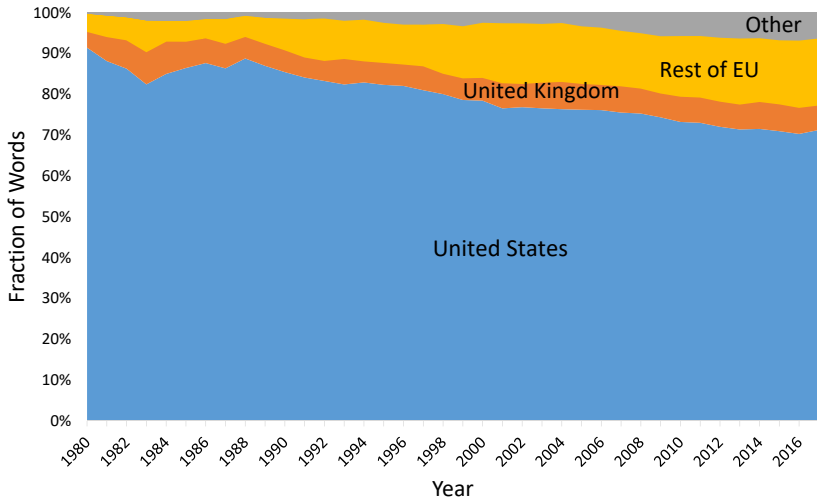
Note: The graph shows the frequency of words within different topics as a fraction of all words across topics. See [here](#) for a list of words included in each category. The graph shows 3-year moving averages.

When We Do Talk About Taxes, Which Taxes Do We Talk About?



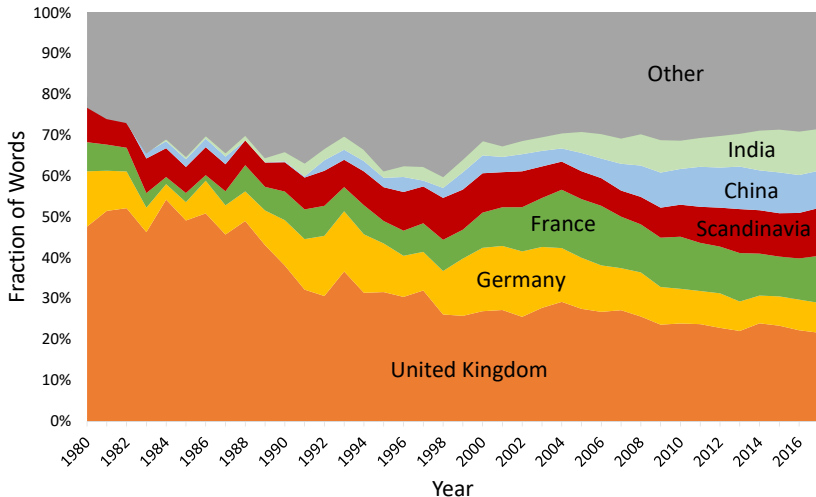
Note: The graph shows the frequency of different words as a fraction of all words in the tax topic. See [here](#) for a list of words included in each category. The graph shows 5-year moving averages.

We Talk Mostly About The US, But Less So Over Time



Note: The graph shows the frequency of each country as a fraction of all countries (among papers that mention any country). See [here](#) for details. The graph shows 5-year moving averages.

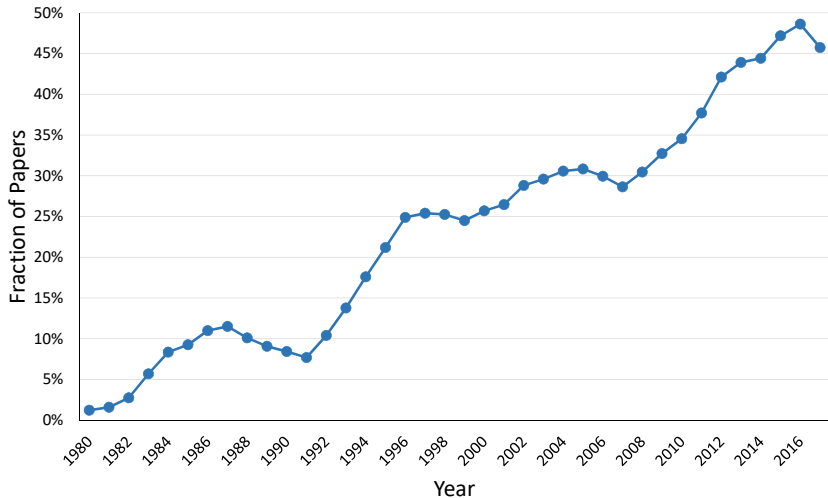
When We Don't Talk About The US, Who Do We Talk About?



Note: The graph shows the frequency of each country as a fraction of all countries excluding the US (among papers that mention any country). See [here](#) for details. The graph shows 5-year moving averages.

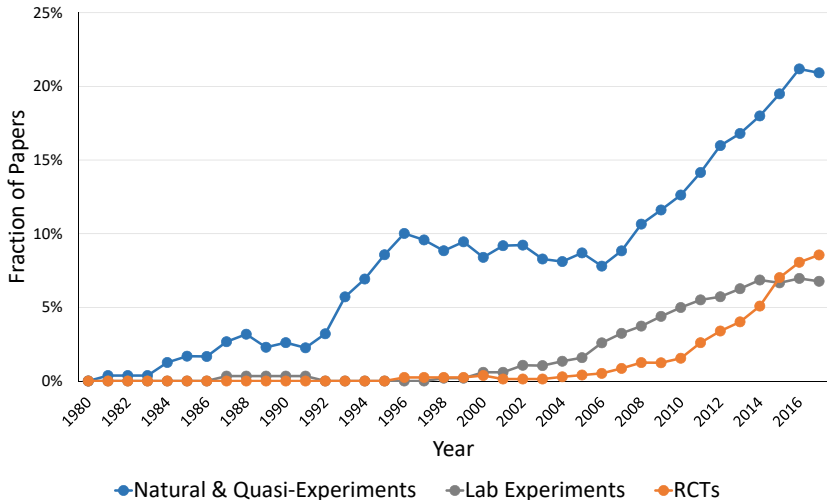
Methods

The Identification Revolution



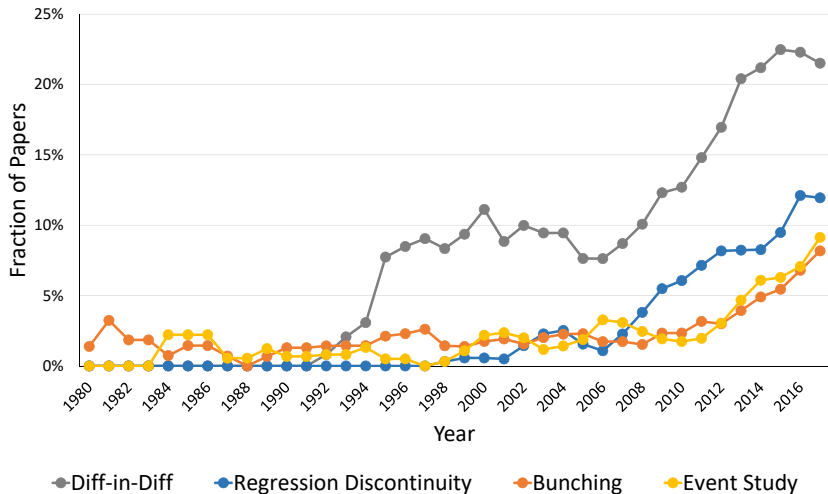
Note: The graph shows the fraction of papers that mention the word "identification" in the context of empirical identification. See [here](#) for details. The graph shows a 5-year moving average.

The Rise of Experiments



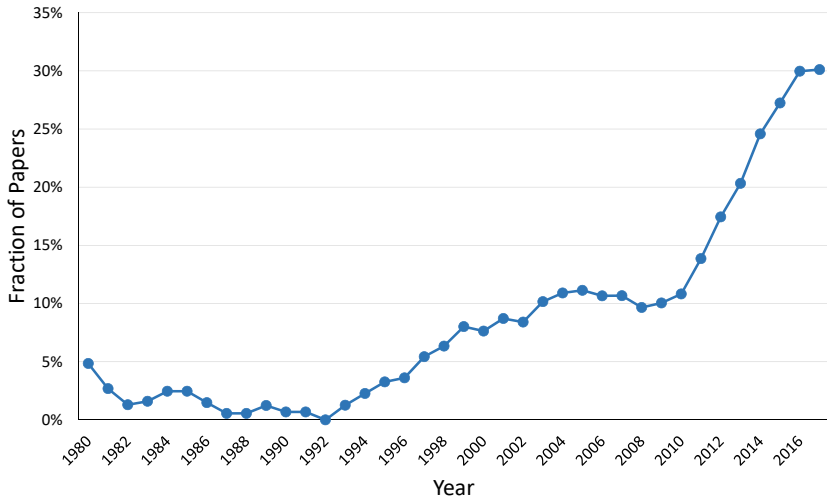
Note: The graph shows the fraction of papers that refer to each type of experiment. See [here](#) for a list of terms. The graph shows 5-year moving averages.

The Rise Of Quasi-Experiments



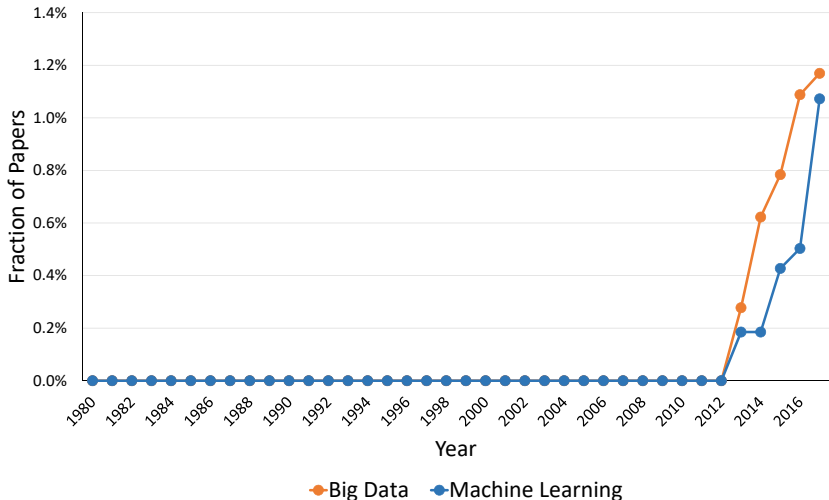
Note: The graph shows the fraction of papers that refer to each type of quasi-experiment. See [here](#) for a list of terms. The graph shows 3-year moving averages.

The Rise Of Administrative Data



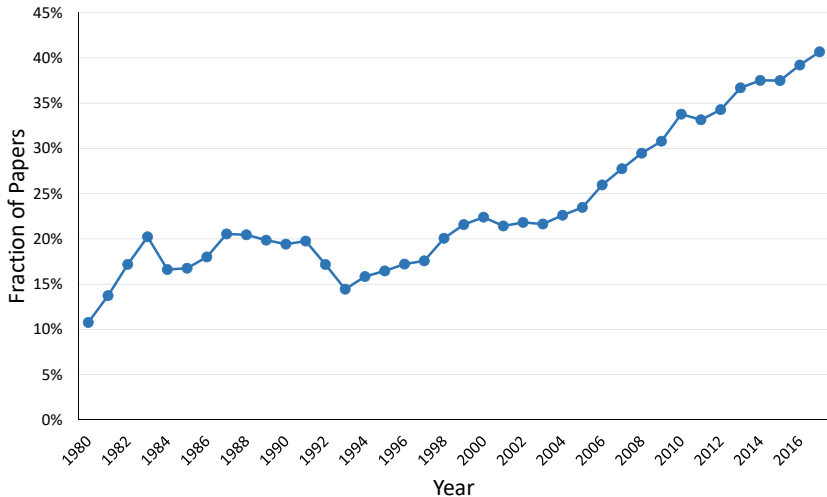
Note: The graph shows the fraction of papers that mention the term “administrative data” or any of its synonyms. See [here](#) for a list of synonyms. The graph shows a 3-year moving average.

Big Data & Machine Learning



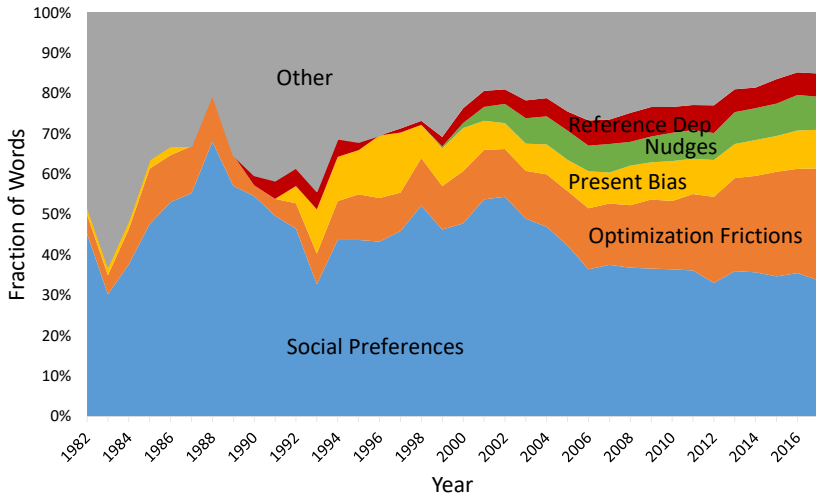
Note: The graph shows the fraction of papers that mention the given term. See [here](#) for details. The graph shows 5-year moving averages.

The Rise Of Behavioral Economics



Note: The graph shows the fraction of papers that mention any word unambiguously related to the topic of behavioral economics. See [here](#) for a list of words. The graph shows a 5-year moving average.

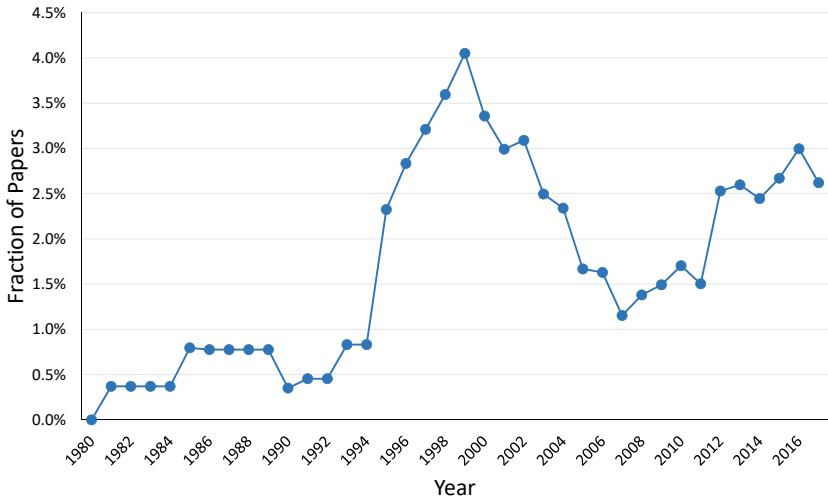
When We Talk About Behavioral Economics, What Do We Talk About?



Note: The graph shows the frequency of words within different topics as a fraction of all words across topics (among papers that mention any word unambiguously related to the topic of behavioral economics). See [here](#) for a list of words included in each category. The graph shows 5-year moving averages.

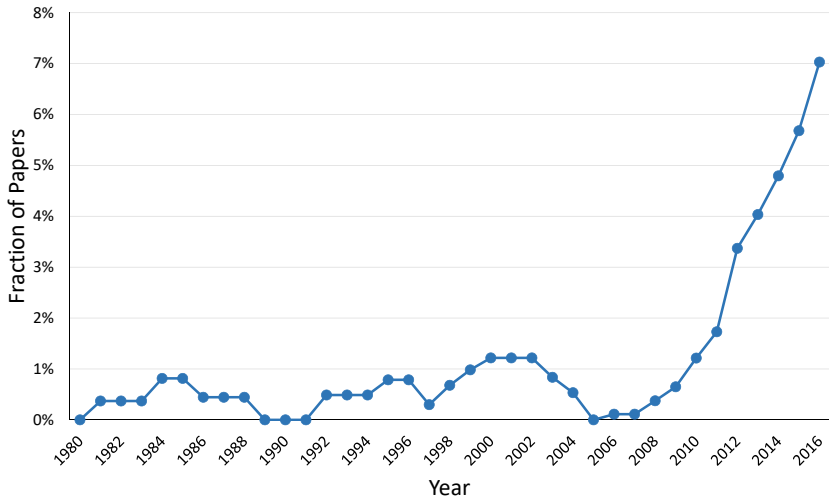
Specific Terms

The Elasticity of Taxable Income



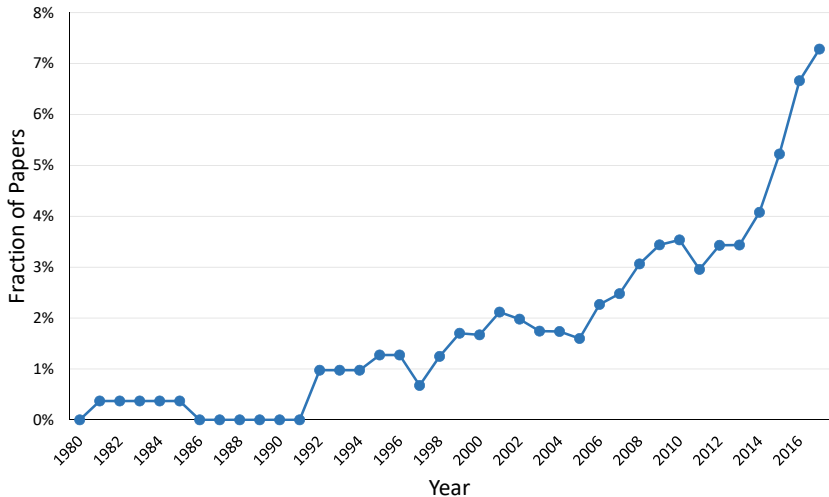
Note: The graph shows the fraction of papers that mention any variation of the term "elasticity of taxable income". See [here](#) for a list of terms. The graph shows a 5-year moving average.

Sufficient Statistics



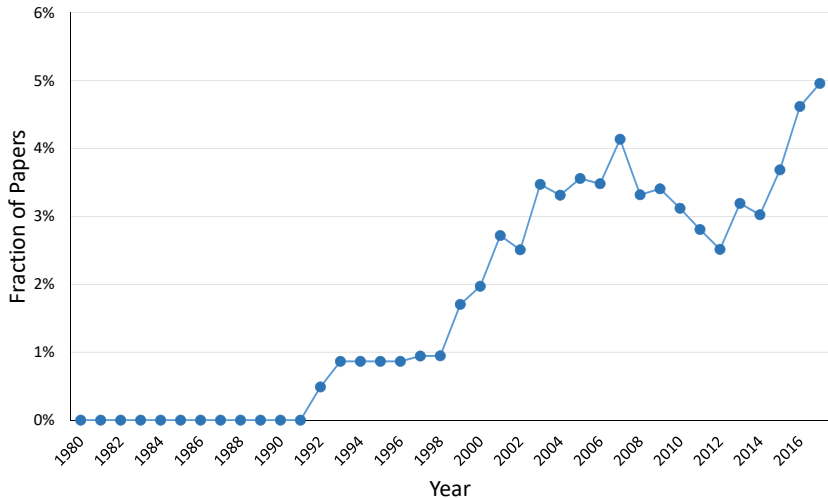
Note: The graph shows the fraction of papers that use the term "sufficient statistics" in the context of welfare analysis. See [here](#) for details. The graph shows a 5-year moving average.

Top 1%



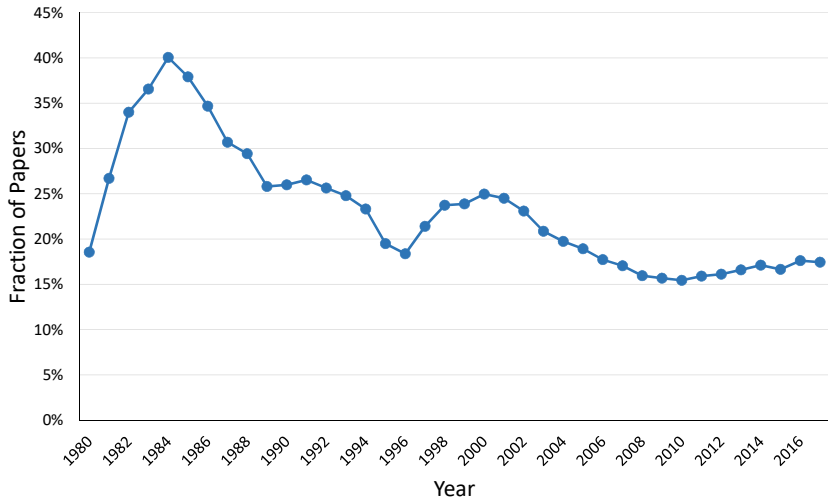
Note: The graph shows the fraction of papers that mention any variation of the term "top 1%". See [here](#) for a list of terms. The graph shows a 5-year moving average.

Quasi-Linear



Note: The graph shows the fraction of papers that mention the term "quasi-linear". See [here](#) for details. The graph shows a 5-year moving average.

General Equilibrium



Note: The graph shows the fraction of papers that mention the term "general equilibrium". See [here](#) for details. The graph shows a 5-year moving average.

What Does It All Mean?

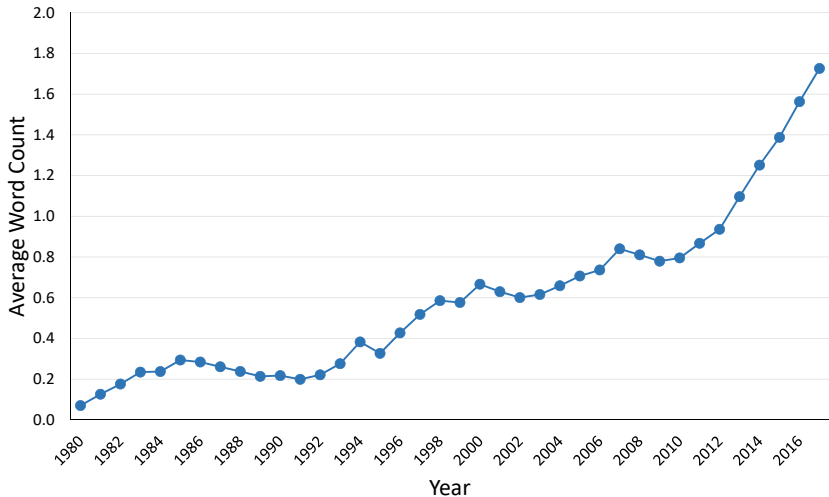
- ▶ The language of (public) economics has changed enormously over the last four decades
- ▶ The striking changes in language reflect changes in how we conduct research
 - ▶ Does it also reflect real progress in learning?
- ▶ The possibilities for this type of language analysis are endless:

Battle of the Sexes

Financial Crisis

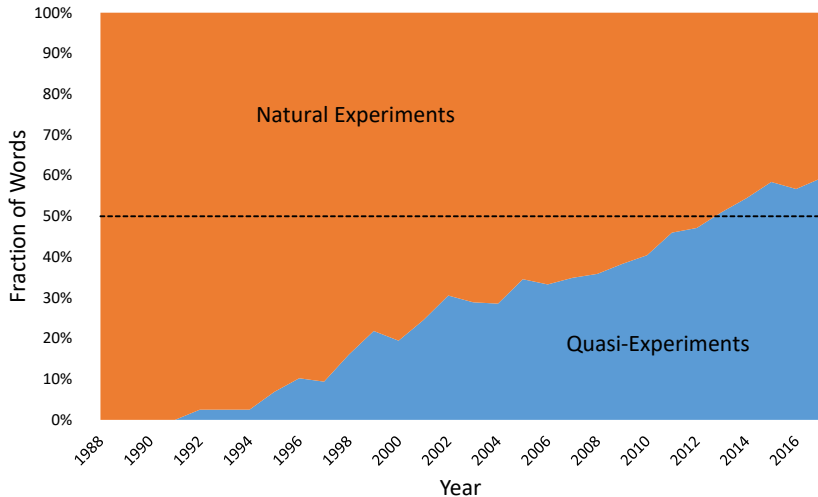
Appendix

The Graphical Revolution



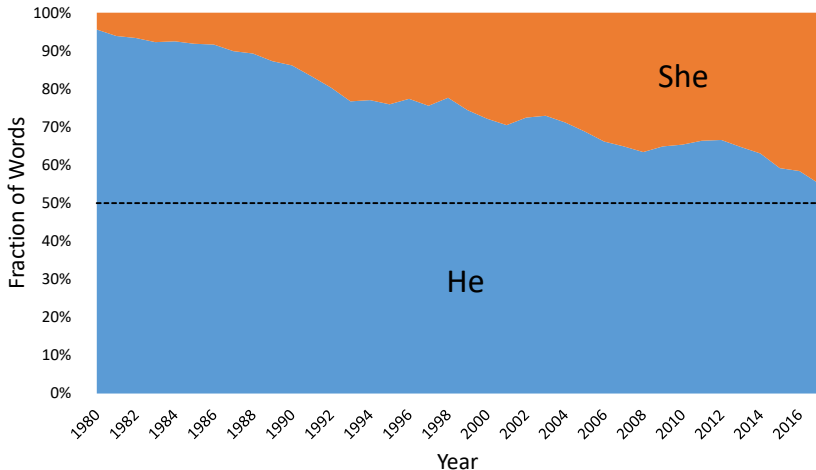
Note: The graph shows the average number of mentions of the term "graph" or any unambiguously related word. See [here](#) for a list of related words. The graph shows a 5-year moving average.

Natural vs Quasi-Experiments



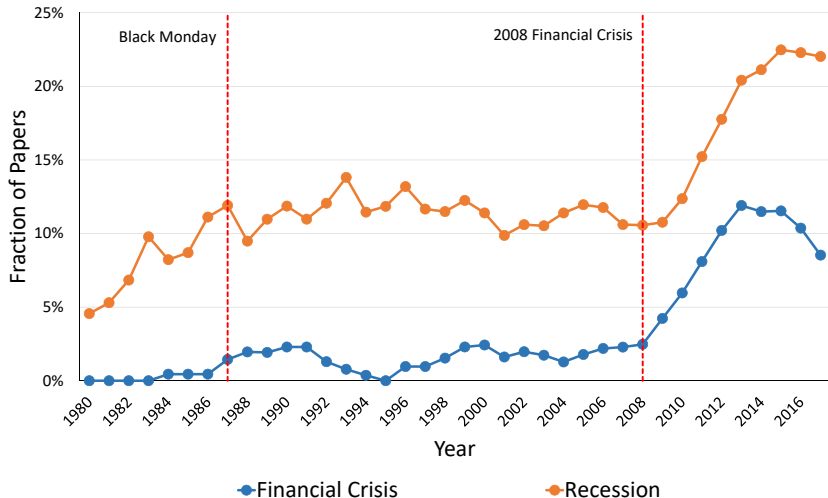
Note: The graph shows the relative frequency of the terms “quasi-experiment” and “natural experiment” among papers that mention either term. See [here](#) for details. The graph shows a 5-year moving average.

The Battle Of The Sexes: Pronouns



Note: The graph shows the relative frequency of male and female personal pronouns among papers that use a personal pronoun at least once. See [here](#) for details. The graph shows a 3-year moving average.

Financial Crisis & Recession



Note: The graph shows the fraction of papers that mention the given term. See [here](#) for details. The graph shows 5-year moving averages.

Category	Words
Taxes	'tax', 'taxes', 'taxation'
Education	'education', 'school(s)', 'schooling'
Transfers	Welfare Programs + Social Insurance (see below for word lists in each category)
Welfare Programs	'Aid to Families with Dependent Children', 'AFDC', 'Children's Health Insurance Program', 'CHIP', 'SCHIP', 'Food Stamp(s)', 'Medicaid', 'public housing', 'Supplemental Nutrition Assistance Program', 'SNAP', 'Supplemental Security Income', 'SSI', 'Temporary Assistance for Needy Families', 'TANF', 'transfer(s)', 'welfare benefit(s)', 'welfare policy(ies)', 'welfare program(s)', 'welfare programme(s)'
Social Insurance	'disability insurance', 'health insurance', 'medicare', 'social insurance', 'unemployment insurance'
Political Economy	'autocracy', 'democracy', 'dictatorship', 'election(s)', 'electoral', 'legislator(s)', 'legislature(s)', 'parliament(s)', 'parliamentary', 'politician(s)', 'political', 'politics', 'president(s)', 'presidential', 'referendum', 'referenda', 'vote(s)', 'voter(s)', 'voting'
Regulation	'regulation(s)', 'regulatory'
Public Goods	'public good(s)'

Category	Words
Labor & Income	Income Tax + Labor Income Tax + Payroll Tax (see below for word lists in each category)
Income Tax	'income tax*'
Labor Income Tax	'labor income tax*', 'labour income tax*', 'labor tax*', 'labour tax*', 'personal income tax*'
Payroll Tax	'payroll tax*', 'social security contribution*', 'social security tax*'
Capital	Capital Tax + Dividend Tax + Capital Gains Tax + Corporate Income Tax + Wealth Tax & Estate Tax (see below for word lists in each category)
Capital Tax	'capital income tax*', 'capital tax*'
Dividend Tax	'dividend income tax*', 'dividend tax*'
Capital Gains Tax	'capital gains tax*', 'capital-gains tax*'
Corporate Income Tax	'corporate income tax*', 'corporate tax*', 'corporation tax*', 'business income tax*', 'business tax*'
Wealth Tax & Estate Tax	'estate tax*', 'inheritance tax*', 'wealth tax*'
Consumption Tax	'commodity tax*', 'consumption tax*', 'excise tax*', 'excises*', 'expenditure tax*', 'indirect tax*', 'sales tax*', 'value added tax*', 'value-added tax*', 'VAT*'
Property Tax	'housing tax*', 'land tax*', 'property tax*'
Other Tax	All other mentions of the word 'tax'

*The symbol * matches any character string following the search string.*

Category	Words
United States	'United States', 'US', 'U.S.', 'USA', 'U.S.A.', 'American', 'North America'
United Kingdom	'United Kingdom', 'Britain', 'England', 'UK', 'U.K.', 'GB', 'G.B.', 'British', 'Northern Ireland', 'Northern Irish', 'Scotland', 'Scottish', 'Wales', 'Welsh'
Rest of EU	'Austria', 'Austrian', 'Belgium', 'Belgian', 'Denmark', 'Danish', 'Finland', 'Finnish', 'France', 'French', 'Germany', 'German', 'Greece', 'Greek', 'Ireland', 'Irish', 'Italy', 'Italian', 'Luxembourg', 'Luxembourgish', 'Netherlands', 'Dutch', 'Portugal', 'Portuguese', 'Spain', 'Spanish', 'Sweden', 'Swedish'
Other	All remaining countries and respective adjectivals.

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Category	Words
United Kingdom	'United Kingdom', 'Britain', 'England', 'UK', 'U.K.', 'GB', 'G.B.', 'British', 'Northern Ireland', 'Northern Irish', 'Scotland', 'Scottish', 'Wales', 'Welsh'
Germany	'Germany', 'German'
France	'France', 'French'
Scandinavia	'Denmark', 'Danish', 'Finland', 'Finnish', 'Iceland', 'Icelandic', 'Norway', 'Norwegian', 'Sweden', 'Swedish'
China	'China', 'Chinese'
India	'India', 'Indian'
Other	All remaining countries and respective adjectivals.

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The Identification Revolution (Explanatory Note)

- ▶ To be included in the paper count, a paper must either mention any of [these](#) phrases or contain one or more “matching sentences”
- ▶ A “matching sentence” must contain the following in the given order:
 1. A variation of the word ‘**identification**’
 2. Followed by 0-2 **wildcard words**
 3. Followed by a variation of any of these words: **effect, response, impact, elasticity, parameter, coefficient**
- ▶ **Match:** “We use an IV strategy to **identify the desired elasticity.**”
- ▶ **Not a match:** “Voter ID laws help election officials identify voters in different districts.”

Phrases

'causal identification', 'causally identified', 'condition for identification', 'condition for identifying', 'conditions for identification', 'conditions for identifying', 'empirical identification', 'identification analysis', 'identification approach', 'identification argument', 'identification assumption', 'identification condition', 'identification framework', 'identification issue', 'identification problem', 'identification properties', 'identification result', 'identification scheme', 'identification strategy', 'identification test', 'identifying assumption', 'identifying condition', 'identifying variation', 'issue identifying', 'issue with identification', 'issues identifying', 'issues with identification', 'non parametric identification', 'non parametrically identified', 'nonparametric identification', 'non-parametric identification', 'nonparametrically identified', 'non-parametrically identified', 'over identified', 'over identifying', 'over-identified', 'over-identifying', 'partial identification', 'partially identified', 'point identification', 'point identified', 'point identifying', 'point-identification', 'point-identified', 'point-identifying', 'problem identifying', 'problem with identification', 'problems identifying', 'problems with identification', 'set identification', 'set identified', 'set identifying', 'set-identification', 'set-identified', 'set-identifying', 'threat for identification', 'threat to identification', 'threats for identification', 'threats to identification', 'under identified', 'under identifying', 'under-identified', 'under-identifying', 'weak identification'

Category	Words
Natural & Quasi-Experiments	'natural experiment*', 'natural-experiment*', 'quasi experiment*', 'quasi-experiment*', 'quasiexperiment*'
Lab Experiments	'laboratory experiment*', 'lab experiment*'
RCTs	'random* (control* field*) (trial* experiment*)'

*The symbol * matches any character string following the search string.*

The pattern (word1|word2) matches either word1 or word2.

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Category	Words
Diff-in-Diff	'difference-in-difference*', 'differences-in-difference*', 'difference in difference*', 'differences in difference*', 'diff-in-diff*', 'd-in-d*', 'DiD'
Regression Discontinuity	'regression discontinuit*', 'regression kink*', 'RKD'
Bunching	'bunching'
Event Study	'event study(ies)'

*The symbol * matches any character string following the search string.*

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Category	Words
Administrative Data	'admin data*', 'admin record*', 'admin register*', 'admin registries*', 'admin registry*', 'administrative data*', 'administrative record*', 'administrative register*', 'administrative registries*', 'administrative registry*'
Big Data	'big data', 'big-data'
Machine Learning	'machine learning'

*The symbol * matches any character string following the search string.*

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Category	Words
Behavioral Economics	Social Preferences + Optimization Frictions + Present Bias + Nudges + Reference Dependence + Other (see below for word lists in each category)
Social Preferences	'altruism*', 'inequality aversion*', 'intrinsic motivation*', 'intrinsically motivated*', 'joy of giving*', 'joy-of-giving*', 'reciprocity*', 'social fairness*', 'social incentive*', 'social motivation*', 'social norm*', 'social preference*', 'social pressure*', 'social recognition*', 'warm glow*', 'warm-glow*'
Optimization Frictions	'attention cost*', 'inattention*', 'inattentive*', 'information friction*', 'limited attention*', 'misperception*', 'mis-perception*', 'optimisation error*', 'optimisation friction*', 'optimization error*', 'optimization friction*', 'salience*'
Present Bias	'hyperbolic discounting*', 'present bias*', 'present-bias*', 'quasihyperbolic discounting*', 'quasi-hyperbolic discounting*', 'self control*', 'self-control*'

*The symbol * matches any character string following the search string.*

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Continued...

Category	Words
Nudges	'automatic enrollment*', 'automatic enrolment*', 'default bias*', 'default effect*', 'nudge*', 'nudging*', 'optimal default*', 'status quo bias*'
Reference Dependence	'endowment effect*', 'focal point*', 'loss aversion*', 'prospect theory*', 'reference dependence*', 'reference-dependent*'
Other	Biased Beliefs + ['behavioral bias*', 'behavioral economic*', 'behavioral model*', 'behavioural bias*', 'behavioural economic*', 'behavioural model*', 'bounded rationality*', 'boundedly rational*', 'bounded-rationality*', 'denial of death*', 'denial-of-death*', 'inconsistent choice*', 'internalit*', 'irrational*', 'paternalism*', 'psychology*']
Biased Beliefs	'biased beliefs*', 'incorrect beliefs*', 'over confidence*', 'over-confidence*', 'projection bias*'

*The symbol * matches any character string following the search string.*

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Previous...

Category	Words
Elasticity of Taxable Income	'elasticities of taxable income*', 'elasticity of taxable income*', 'responsiveness of taxable income*', 'taxable income elasticit*', 'taxable income respons*'
Top 1%	'top 1%*', 'top 1 percent*', 'top 1p*'
Quasi-Linear	'quasi linear*', 'quasi-linear*', 'quasilinear*'
General Equilibrium	'general equilibrium*', 'general-equilibrium*'

*The symbol * matches any character string following the search string.*

ETI

Top 1%

Quasi-Linear

General Equilibrium

Sufficient Statistics (Explanatory Note)

- ▶ To be included in the paper count, a paper must contain one or more “matching sentences”
- ▶ A “matching sentence” must contain at least one word from each of the following sets of words:
 1. ['parameter', 'elasticity', 'response', 'responsiveness', 'statistic', 'parameters', 'elasticities', 'responses', 'statistics']
 2. ['sufficient', 'sufficiency']
 3. ['efficiency', 'welfare', 'deadweight loss', 'excess burden', 'optimal']
- ▶ **Match:** “We show that this elasticity is a sufficient statistic for determining the optimal level of unemployment benefits.”
- ▶ **Not a match:** “Previous authors have challenged the assertion that Tobin’s Q is a sufficient statistic for determining the investment decisions of firms.”

Category	Words
Graphical	'graph*'
Natural Experiments	'natural experiment*', 'natural-experiment*'
Quasi-Experiments	'quasi experiment*', 'quasi-experiment*', 'quasiexperiment*'
Financial Crisis	'financial cris*'
Recession	'recession*'

*The symbol * matches any character string following the search string.*

Graphical

Natural vs Quasi-Experiments

Financial Crisis & Recession

Category	Words
Male Personal Pronouns	'he', 'him', 'his'
Female Personal Pronouns	'she', 'her', 'hers'

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