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The Era of Empirical Evidence

Brandon D. Brice^{*}, Hugo M. Montesinos-Yufa[†]

Abstract

We document a dramatic methodological shift in the economics profession. By text mining the titles of the 500 most-cited titles in economics' top journals, by decade since the 1950s, we provide evidence for a shift away from advancing and testing theory, and towards a profession that is directed by the provision of empirical evidence. We provide a simple model to explain this methodological shift through changes in relative costs of producing theoretical and empirical research, in which innovative advancements in computing technology and data accessibility since the 1990s play a significant role.

Key words: History of Economic Thought, Economic Methodology, Word Clouds

JEL codes: B20, B41, Y10

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We would like to thank Randall G. Holcombe for his helpful comments.

I. Introduction

In 1947, Paul Samuelson wrote *Foundations of Economic Analysis*. This influential work formalized a theoretical structure for economics by providing a mathematical framework for constrained optimization and its implications for human action (Dixit, 2012). This approach to the discipline influenced teaching and research in the discipline for the decades to come. Much of the reason for this framework's success was Samuelson's *Economics* text, which was first published the following year. This revolutionized economic instruction, which because of his influence began increasingly to focus on formalized theoretical structures to investigate economic questions. The education of generations of economists to follow were rooted in these lessons³.

This formalization coincided with the postwar expansion of economics and journal publications in the American Economic Review (AER), as documented by Margo (2011) in his Economic History of the American Economic Review. Early in the Samuelson era, researchers in economics' top journals focused on rigorously creating, and creatively testing, economic theory. With the passage of time, the profession drifted away from theoretical models to give more emphasis to applied work, resulting in a profession dominated by the provision of empirical evidence. Biddle and Hamermesh (2017) document this as a movement away from consensus, where the discipline focused on optimization and equilibrium, and towards a focus on applied work in an experimentalist paradigm. This implies a subtle, yet major, shift in how economists see their contributions. We contribute to this literature by providing a simple model for this shift based on the relative costs of conducting each type of research. We then provide evidence consistent with this shift utilizing bibliometric techniques on the most-cited articles in three of economics top

³ Both directly through students such as Diamond, Krugman, and Stiglitz; and indirectly through the thousands of students that utilized his text.

journals; AER, Quarterly Journal of Economics (QJE), and Journal of Political Economy (JPE); by decade since the 1950s. We create word clouds from the most utilized words in the titles of the 500 most-cited papers of these journals for each decade. To complement this analysis, we also provide the number of pages, equations, figures, regressions, tables, appendices, and citations for the five most cited articles in the AER, by decade, and the most cited article in the JPE and QJE. See the Appendix for this analysis, which supports the methodological trends documented in the body of this paper.

We are not the first to note or to acknowledge this shift. For example, Card, DellaVigna, and Malmendier (2011) document that over 68 percent of field experiments in five top economic journals from 1975 to 2010 are descriptive studies lacking any explicit model. Margo (2011) states that much of the change in the economic profession reflects the growing use of mathematics and statistics in economic analysis. Card and DellaVigna (2013), Hamermesh (2013), and Margo (2011) also provide insightful evidence on how the profession has changed in multiple dimensions including the number and type of submissions, acceptance rates, length of the articles, number of authors, utilization of data, and citations. These papers, however, do not provide an analysis of the fundamental methodological change in the profession or a framework to understand it. This paper provides evidence for a major systematic methodological shift in the profession by applying bibliometric techniques to economics most-cited publications, and provides a formal model to assist in our understanding for why this shift has occurred. We also provide insight into the major focus of economic research, for each decade since the 1950s.

Additionally, our paper informs a growing body of literature on the history of economic thought, and the history of economic methodology. This existing literature outlines how the field has developed (Backhouse 2008), how it has become more applied (Hamermesh 2013, Backhouse

and Cherrier 2014, Biddle and Hamermesh 2017). Our paper also informs a growing literature on bibliometric methods. For example, Ambrosino et al. (2017) use the Latent Dirichlet Allocation method to assess the prevalence of topics in economic publications, but does not address the methodology used in economic publications, or its prevalence over time.

By understanding how the topics, and methodology, evolved in the most-cited articles from economics' top journals since 1950; we provide strong evidence for how the focus of the discipline has progressed. Additionally, we provide insight for the future direction of the discipline. Organization for the rest of the paper is as follows: Section II provides a simple model for economic research tradeoffs. Section III provides a bibliometric analysis of the most-cited articles in the AER, QJE, and JPE by decade; providing evidence for how empirical research trends have evolved in the profession. Section IV provides further discussion and acknowledges potential limitations of the analysis. Section V provides a brief survey of emerging data sources and its applications as the focus of the discipline becomes more empirical. Section VI concludes the paper.

II. A Simple Model for Economic Research Tradeoffs

To assist in our understanding of why the economics profession has shifted away from the creation of pure theory and towards empirical analysis, we consider a researcher solving the following maximization problem:

$$\text{Max } F(K, E) \quad \text{subject to} \quad t_K K + t_E E = T \quad (1)$$

where K is a measure of the knowledge created, or the importance of the research in terms of advancing a new theory or testing an existing theory. E is a measure of the evidence provided consistent with the previous theory. t_K and t_E represent the time spent on each activity, and T represents the total impact of the research conducted. The first order conditions imply:

$$F_K/F_E = t_K/t_E \quad (2)$$

This implies that there is a tradeoff between creating new theory and providing evidence for existing theory, and the optimal allocation depends on the relative costs of doing each activity (t_K/t_E).⁴ With advancements in computing technology and data accessibility in recent decades, the relative cost of performing empirical techniques, conducive to evidence provision, has declined. Consequently, the optimal time allocation shifts towards providing evidence for existing theories rather than advancing new knowledge. Researchers, thus, optimize by utilizing more of their scarce time for empirical research and experimentation as advancements occur in data collection, availability, software, and empirical techniques.

⁴ This tradeoff exists regardless of the functional form of utility function F , as long as minimal conditions are satisfied. A necessary condition is that the first derivatives F_K and F_E exist. A sufficient condition is that F is twice differentiable and strictly quasi-concave.

III. Research Trends

Utilizing the bibliometric technique of text mining, we search the titles of the 500 most-cited journal articles in the AER, JPE, and QJE from each decade since 1950; to see which words are most commonly used. This informs our analysis by providing insight into the focus and methodology in top-ranked journals in economics during these decades. We create word clouds for each decade to help visualize the most important topics and emerging trends.

1950s

The most common words in the titles of the most-cited articles from the 1950s were ‘economic’, ‘theory’, ‘growth’, ‘income’, and ‘development’. See Figure 1: Panel A. The use of these words suggests a profession dominated by theoretical contributions and their implications. Testing economic theory was the major focus in the discipline’s most influential articles from this decade. Even the most-cited article in the AER is titled, “Theories of Decision-Making in Economics, and Behavioral-Science” by Herbert A. Simon (1959). Theories specifically pertaining to growth, income, and development were widely tested. These articles most notably include “A Contribution to the Theory of Economic-Growth” by Robert M. Solow (1956), which tested the knife-edge assumption in the Harrod-Domar Growth Model, and provided a new theoretical framework incorporating the substitution of capital and labor.

1960s

The most utilized word in the 1960s was ‘theory’; followed by ‘economic’, ‘investment’, ‘growth’, and ‘capital’. See Figure 1: Panel B. Again, the focus of this decade was economic theory. Economic growth theory remains an important topic, with a focus on investment and capital accumulation. “Toward a Theory of Property Rights” by Harold Demsetz (1967) described

the theoretical importance of institutions for growth by internalizing externalities. “National Debt in a Neoclassical Growth Model” by Peter A Diamond (1965) identified the mechanisms through which debt reduces capital stocks. “International Investment and International Trade in the Product Cycle” by Raymond Vernon (1966) tested the Heckscher-Ohlin international trade model and introduced a new model for dynamic comparative advantage. All of these highly cited articles relate to this continued focus.

1970s

Again, ‘theory’ is the most utilized word in the 1970s. See Figure 1: Panel C. This demonstrates consistency in the most cited-papers from the 1950s through the 1970s, in economics top journals. While the primary topics shifted, a focus on testing theory is consistently present. The other most utilized words are ‘model’, ‘market’, ‘income’, ‘economic’, and ‘analysis’ as economic modeling climbs in importance. There is also a rejuvenation in the analysis of income, and an emerging interest in market analysis in the profession. “Market for Lemons – Quality Uncertainty and Market Mechanism” by George A. Akerlof (1970) is an example of a highly cited article in this area.

1980s

For the first time in this analysis, ‘theory’ falls to the third most utilized word in these titles. See Figure 1: Panel D. The word ‘market’ is now number one, after climbing to number three in the previous decade. This suggests a subtle shift in the profession with a growing interest in market analysis. Again, ‘model’ is the second most used word, representing the continued importance of modeling in the profession. The words ‘economic’ and ‘price’ are the fifth and sixth most utilized. “Agency Costs of Free Cash Flow, Corporate-Finance, and Takeovers” by Michael C. Jensen

(1986) is the most-cited article in the AER from this decade, and illuminates the frictions between managers and shareholders, particularly in companies with free cash flows, in the market.

1990s

Growth analysis has a resurgence in the 1990s with many of the most-cited articles investigating this topic. For instance, “A Sensitivity Analysis of Cross-Country Growth Regressions” by Ross Levine and David Renelt (1992) is the most-cited article from the AER from this decade, and “Economic Growth in a Cross-Section of Countries” by Robert J. Barro (1991) is the most-cited work in the QJE. Given the focus on economic growth during this decade, it is no surprise that ‘growth’ is the most utilized word in these titles. See Figure 2: Panel A. The word ‘theory’ falls to fifth and ‘modeling’ falls to sixth, while ‘evidence’ appears for the first time as it moves into third on the list. The other top words in the 1990s are ‘economic’ and ‘market’, consistent with the continued focus on market analysis since the 1970s.

2000s

In the 2000s, ‘evidence’ becomes the most utilized word in the titles of economics’ top journal articles. See Figure 2: Panel B. This corresponds with a dramatic shift in methodology, as theory and model fall to fifth and sixth on this list. The most cited articles in economics’ top journals were beginning to focus heavily on the provision of empirical evidence in the 2000s. This is consistent with the findings of Biddle and Hamermesh (2017) which document a partial abandonment of economic theory in applied work beginning in the late 1990s.

Daron Acemoglu et al. actually have highly-cited articles in all three journals (AER, JPE, and QJE) during this decade; making use of advanced empirical methods while helping to establish

a new focus on institutional analysis. “The Colonial Origins of Comparative Development: An Empirical Investigation” (2001) is the most-cited article in the AER. “Unbundling Institutions” (2005) was one of the most-cited articles in the JPE, and “Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution” (2002) was one of the most cited in the QJE. All of these articles make use of empirical methodology, cross-country regression, and two stage least-squared approaches in an attempt to identify causal parameters in structural equations.

While these papers by Acemoglu et.al. highlight the continued push towards empirical analysis in the discipline, the most-cited paper in the QJE during this decade calls for caution when employing a particular type of empirical analysis. “How Much Should We Trust Differences-in-Differences Estimates?” by Marianne Bertrand, Esther Duflo, and Sendhil Mullainathan (2004) reflects the concern in the profession for the increasing reliance on empirics, and the pursuit of providing non-theoretical evidence in economics.

2010s

During the 2010s, almost one in five of the 500 most-cited papers in the profession contains the word ‘evidence’ in its title. ‘Evidence’ appears significantly more frequently than any other word, in each prior decade, in our analysis. See Figure 2: Panel C. The words ‘trade’, ‘risk’, ‘experiment’, ‘effects’, and ‘economic’ round out the list. Words that commonly appeared in other decades such as ‘market’, ‘growth’, and ‘theory’ no longer make the list. This provides evidence that by this decade economists largely see themselves as providing evidence, rather than creating or testing theory, and that they value the research of others who provide evidence over articles that create pure theory.

1950 – 2015

Even though the word ‘evidence’ first appeared in our analysis in the 1990s, ‘economic’ and ‘evidence’ are by far the most utilized words when pooling and investigating the titles from all decades. This is because the profession had a tremendous and noticeable shift away from creating theory and towards providing evidence beginning in the 1990s. See Figure 2: Panel D.

IV. Discussion and Limitations

The analysis in Section III provides evidence consistent with our model, indicating that the trade-off between advancing knowledge (creating new ways of thinking, new theories, new models, or falsifying existing theories) and providing evidence for already existing theories is leaning significantly toward the latter in recent years. The explanation suggested by our model lies in the reduction in relative costs of performing applied work, relative to theoretical research, over time. This fits with the existing literature that identifies a contemporary trend in economic research, which is becoming more applied.

While our analysis is intensive, we recognize that it is limited in several dimensions. Field journals publish applied and theoretically specialized work. A more comprehensive analysis could include a detailed examination of the methodological shift in field journals. We chose not to include this analysis for brevity, and because a focus on top general-interest journals better informs our understanding of the general direction of the discipline. A focus on the AER, QJE, and JPE achieves these goals. Therefore, we limit our scope to these three top economic journals.

A second limitation is that a focus on the 500 most-cited papers in these journals inevitably omits crucial papers in the profession published in other journals. For example, we exclude highly cited works such as "The Problem of Social Cost" by Ronald Coase, published in the *Journal of Law and Economics* in 1960, when we limit our focus to other journals. Although we regret not including such articles, providing such articles in an ad-hoc manner could be misleading and bias our analysis, as our own prior knowledge of the literature could influence the results of our bibliometric analysis. We therefore adhere to the original focus on highly cited articles in

economics top journals, and address our research question scientifically acknowledging that some important papers may inevitably fall outside scope of our study.

Third, we text mine the titles, not the full-texts, of the 500 most-cited papers by decade. This approach has benefits and drawbacks. On one hand, the titles are short, efficient, and representative of their papers. They also tend not to have duplicate words. On the other, titles may capture systematic trends among economists not reflected in the body of the paper. To minimize this concern, we perform two separate analyses. In one, we carefully read the full text of the five most-cited papers by decade in the AER, and the most-cited articles in the JPE and QJE by decade. We tabulated the number of equations, regressions, tables, figures, theorems, proofs, and mathematical appendices. These results are available in the appendix of this paper. In the second, we text mined the abstracts of the 500 most cited papers in these journals by decade. These results are available upon request. In both analyses, the results corroborated our primary findings that research in top journals became more empirical, and less theoretical, over time.

V. A Brief Survey of Emerging Data Sources and Applications

Corresponding with economics' methodological shift towards the provision of evidence and empirical analysis, which began in the 1990s, are increases in the collection and utilization of data. In particular, we witness the emergence and analysis of "big data". These massive datasets are a consequence of the same phenomena that has led to increases in sophisticated empirical analysis, and advancements in computing power and memory. Below we outline a few of the currently available big data sources, highlight how economists have begun utilizing this data, identify analytical problems that these sources can help overcome, and provide a road-map for the future of the economics profession which we anticipate will increase its analysis and utilization of these types of data sources.

Nothing may highlight the amazing possibilities of the big data revolution in economics more than the recent use of satellite imagery in empirical research. This type of data collection and analysis certainly was not available in Samuelson's era, and showcases the potential of modern technology to display and collect massive amounts of data from very sophisticated sources. Maxim L. Pinkovskiy and Xavier Sala-i-Martin (2016) use data associated with satellite imagery of artificial lighting, whose error is likely independent of measurement error, to evaluate existing economic activity measures. Remarkably, this analysis concluded that unadjusted GDP growth predicts true income better than series based on purchasing power parity (PPP) adjustments. This is a conclusion that would have been difficult, if not impossible, to evaluate without the emergence of this contemporary big data source. In a more recent publication, the same authors, along with Hunter Clark, overcome historically unreliable data sources to analyze China's true GDP growth rate using satellite imagery (Clark et. al, 2017). The possibilities to utilize satellite data seem

endless when you consider that this data contains information not just on lights; but also on variables such as heat, wave activity, and weather.

In Section III, we demonstrate that prices were a major focus in economics' top journals beginning in the 1970s. Prices even cracked the top five most utilized words in our journal analysis in the 1980s. It is unlikely that the authors of these highly cited articles ever could have imagined having access to data on over fifteen million products, from over 900 retailers, in over sixty countries updated daily. Remarkably, today this data is publically available thanks to the Billion Prices Project. This big data project utilizes advances in automated software to scrape millions of online prices in real time. This overcomes the problems associated with historically expensive, complex, and slow price collection procedures to provide more reliable, larger, and faster price data for research investigating topics such as inflation (Cavallo and Rigobon, 2016).

Other venues, which we are all familiar with, also generate big data. For instance Facebook, which has over one billion users logging in daily, provides huge amounts of data about its users in their Graph API. Many large facial recognition databases exist, and along with it the endless possibilities for its analytical uses. Google searches, student performance, songs, health, genetics, and government data are just several of the many big datasets that are appearing for use in the era of empirical evidence.

In 2015, Bernard Marr wrote that in the previous two years alone more data was generated than in all of the previous years in human history.⁵ With this data explosion expected to continue, we anticipate that the economic profession will become even more focused on the provision of evidence and empirical analysis of new, larger, and better data sources. While this revolution and

⁵ See Bernard Marr's Forbes article (September, 2015). His books include *Big Data in Practice*, *Big Data*, *Key Business Analytics*, and *Key Performance Indicators*.

its future economic contributions are certain to provide important insights into human behavior, it is important for economists to ensure that the data they decide to analyze (out of the immense number of emerging data sources) are reputable and reliable. It is more important than ever to ensure that the analytical strategies we use to investigate these data are the correct ones; and that the conclusions we draw as economists for businesses, the public, and governments are sound and reserved.

VI. Conclusion

Bibliometric analysis of the titles of the 500 most-cited articles in three of economics' top journals uncovers a rapid methodological shift in the profession that began in the 1990s. Before this, economists focused on creatively testing and advancing economic theory. By the 1990s, a revolution was taking place where economists began to see their role as providers of evidence. This corresponds with a massive shift in computing power, and technological innovation, that concurrently occurred in the 1990s; which likely explains the widespread use of empirical techniques. This shift was not due to the predictions or calls of any particular economist, but rather from a spontaneous process in how economists saw their role in the profession, and aided by technological advances that were not previously available. Since the 1990s, there now appears to be a growing expectation for rigorous empirical analysis in order to publish in these top journals.

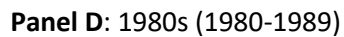
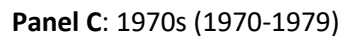
To better visualize this shift in economic publications, we form word clouds from the most commonly used words in the 500 most-cited articles from the AER, JPE, and QJE for each decade since the 1950s. From the 1950s through the 1970s, testing economic theory was the major focus of highly cited research in these journals. Theoretical analysis of many topics such as growth, income, capital, investment, and markets appear in our results. This theoretical analysis began to focus on markets more broadly in the 1980s.

In the 1990s, economic growth research dominated the profession, while there were emerging signs of evidence provision starting to play an important role. By the 2000s, 'evidence' was the most used word in the titles of the most-cited articles and the methodological approaches in the profession were shifting. By the 2010s, the word 'evidence' is in almost one in every five

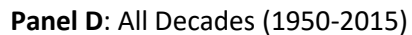
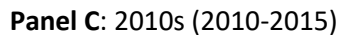
titles. A search for evidence is what the economics profession has become, and we expect continued focus on empirical analysis long into the future.

Corresponding with the shift towards empirical analysis and a search for evidence was the emergence of big data sources. Along with advances in data availability come new methods to analyze the data, new protocols to collect it, and new ways to understand the world. Empirical evidence allows us to measure and test hypotheses that otherwise had not been possible, expanding the knowledge frontier. The changes and implications that this exponential trend has had, and will continue to have, on the economic profession are dramatic. We are currently witnessing many of those changes. Records of satellite imagery, the Billion Price Project, biological and genome data, political surveys, social media data, and web searches are just a few examples of big data sources that economic researchers utilize today.

In order to document the methodological evolution in the profession since the 1950s, we amusingly use a computer intensive technique and a large data source that was not available decades ago. This research fits with the growing methodological trend that we identify. We are in an era of change, the era of evidence. Understanding and adapting to this change is paramount for understanding the future of our discipline, and ensuring the “evidence” we provide is justifiable and sound will be of ever-increasing importance.



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Appendix: The five most cited papers in the AER, by decade. From 1950 to 2015.

Panel A: 1950s													
Title	Authors	Journal	Year	Volume	Issue	#Pages	#Equations	#Figures	#Regressions	#Tables	#Appendices	Cites	Cites/year
The Cost Of Capital, Corporation Finance And The Theory Of Investment	Modigliani, F; Miller, M	AER	1958	48	3	36	34	6	4	4	0	2524	43.52
Theories Of Decision-Making In Economics And Behavioral-Science	Simon, Ha	AER	1959	49	3	30	0	0	0	0	0	728	12.77
Distribution Of Incomes Of Corporations Among Dividends, Retained Earnings, And Taxes	Lintner, J	AER	1956	46	2	21	2	0	1	1	0	543	9.05
International-Trade And Factor Mobility	Mundell, Ra	AER	1957	47	3	14	0	4	0	0	0	401	6.8
The Size Distribution Of Business Firms	Simon, Ha; Bonini, Cp	AER	1958	48	4	10	3	0	0	2	0	329	5.67
A Pure Theory Of Local Expenditures	Tiebout, Cm	JPE	1956	64	5	8	0	0	0	0	0	3549	59.17
A Contribution To The Theory Of Economic-Growth	Solow, Rm	QJE	1956	70	1	29	20	9	0	0	0	3279	54.65

Panel B: 1960s													
Title	Authors	Journal	Year	Volume	Issue	#Pages	#Equations	#Figures	#Regressions	#Tables	#Appendices	Cites	Cites/year
Uncertainty And The Welfare Economics Of Medical-Care	Arrow, Kj	AER	1963	53	5	32	2	0	0	0	1	1618	30.53
Toward A Theory Of Property Rights	Demsetz, Harold	AER	1967	57	2	12	0	0	0	0	0	1494	30.57
Role Of Monetary Policy	Friedman, Milton	AER	1968	58	1	16	0	0	0	0	0	1382	28.79
National Debt In A Neoclassical Growth-Model	Diamond, Pa	AER	1965	55	5	24	38	8	0	0	2	993	19.47
Allocative Efficiency Vs X-Efficiency	Leibenstein, H	AER	1966	56	3	23	0	4	0	2	0	968	19.36
Crime And Punishment - Economic Approach	Becker, Gs	JPE	1968	76	2	48	55	4	0	2	1	2989	62.33
International Investment And International Trade In Product Cycle	Vernon, Raymond	QJE	1966	80	2	17	0	1	0	0	0	1930	38.60

Table 1 (Continued): The five most cited papers in the AER, by decade. From 1950 to 2015.

Panel C: 1970s													
Title	Authors	Journal	Year	Volume	Issue	#Pages	#Equations	#Figures	#Regressions	#Tables	#Appendices	Cites	Cites/year
Production, Information Costs, And Economic Organization	Alchian, Aa; Demsetz, H	AER	1972	62	5	18	0	0	0	0	0	3051	69.34
Monopolistic Competition And Optimum Product Diversity	Dixit, Ak; Stiglitz, Je	AER	1977	67	3	11	58	4	0	0	0	2135	54.74
Migration, Unemployment And Development - 2-Sector Analysis	Harris, Jr; Todaro, Mp	AER	1970	60	1	16	12	3	0	0	3	1456	31.65
Political Economy Of The Rent-Seeking Society	Krueger, Ao	AER	1974	64	3	12	19	3	0	1	0	1326	31.57
Money, Income, And Causality	Sims, Ca	AER	1972	62	4	12	2	2	5	5	1	1128	25.64
Pricing Of Options And Corporate Liabilities	Black, F; Scholes, M	JPE	1973	81	3	17	27	1	0	0	0	6737	156.70
Market For Lemons - Quality Uncertainty And Market Mechanism	Akerlof, Ga	QJE	1970	84	3	12	10	0	0	2	0	4181	90.89

Panel D: 1980s													
Title	Authors	Journal	Year	Volume	Issue	#Pages	#Equations	#Figures	#Regressions	#Tables	#Appendices	Cites	Cites/year
Agency Costs Of Free Cash Flow, Corporate-Finance, And Takeovers	Jensen, Mc	AER	1986	76	2	6	0	0	0	0	0	3580	119.3
Credit Rationing In Markets With Imperfect Information	Stiglitz, Je; Weiss, A	AER	1981	71	3	17	25	10	0	0	0	2352	67.2
Clio And The Economics Of Qwerty Network Externalities, Competition, And Compatibility	David, Pa	AER	1985	75	2	5	0	0	0	0	0	1663	53.65
Equilibrium Unemployment As A Worker Discipline Device	Katz, Ml; Shapiro, C	AER	1985	75	3	16	16	0	0	0	1	1619	52.23
	Shapiro, C; Stiglitz, Je	AER	1984	74	3	11	12	4	0	0	0	1433	44.78
Increasing Returns And Long-Run Growth	Romer, Pm	JPE	1986	94	5	35	9	5	0	3	0	3746	124.87
A Theory Of Competition Among Pressure Groups For Political Influence	Becker, Gs	QJE	1983	98	3	29	30	2	0	0	1	1446	43.82

Table 1 (Continued): The five most cited papers in the AER, by decade. From 1950 to 2015.

Panel E: 1990s													
Title	Authors	Journal	Year	Volume	Issue	#Pages	#Equations	#Figures	#Regressions	#Tables	#Appendices	Cites	Cites/year
A Sensitivity Analysis Of Cross-Country Growth Regressions Incorporating Fairness Into Game-Theory And Economics R&D Spillovers And The Geography Of Innovation And Production	Levine, R; Renelt, D	AER	1992	82	4	21	2	0	10	10	0	1511	62.96
Financial Dependence And Growth	Rabin, M	AER	1993	83	5	21	0	6	0	0	2	1316	57.22
Protection For Sale	Audretsch, D; Feldman, M	AER	1996	86	3	10	0	1	3	6	0	1281	64.05
Law And Finance	Rajan, Rg; Zingales, L	AER	1998	88	3	27	1	1	3	10	0	1157	64.28
Economic-Growth In A Cross-Section Of Countries	Grossman, G; Helpman, E.	AER	1994	84	4	17	19	3	0	0	0	1043	47.41
	La Porta, R; Et. Al.	JPE	1998	106	6	42	0	0	3	8	0	3198	177.67
	Barro, Rj	QJE	1991	106	2	36	0	11	6	6	3	2278	91.16

Panel F: 2000s													
Title	Authors	Journal	Year	Volume	Issue	#Pages	#Equations	#Figures	#Regressions	#Tables	#Appendices	Cites	Cites/year
The Colonial Origins Of Comparative Development: An Empirical Investigation	Acemoglu, D; Johnson, S; Robinson, Ja.	AER	2001	91	5	32	5	0	8	8	3	1823	121.67
Erc: A Theory Of Equity, Reciprocity, And Competition	Bolton, Ge; Ockenfels, A	AER	2000	90	1	27	13	6	0	0	1	1235	77.19
Gravity With Gravitas: A Solution To The Border Puzzle	Anderson, J; Van Wincoop	AER	2003	93	1	22	26	0	1	6	2	973	74.85
Cooperation And Punishment In Public Goods Experiments	Fehr, E; Gächter, S	AER	2000	90	4	14	2	3	1	5	0	947	59.19
Risk Aversion And Incentive Effects	Holt, Ca; Laury, Sk	AER	2002	92	5	11	3	6	0	4	0	861	61.50
Nominal Rigidities And The Dynamic Effects Of A Shock To Monetary Policy	Christiano, Lj; Eichenbaum, M, M; Evans, Cl	JPE	2005	113	1	44	43	6	1	2	0	1003	91.18
How Much Should We Trust Differences-In-Differences Estimates?	Bertrand, M; Duflo, E; Mullainathan, S	QJE	2004	119	1	26	3	0	7	8	0	1339	111.58

Table 1 (Continued): The five most cited papers in the AER, by decade. From 1950 to 2015.

Panel G: 2010s													
Title	Authors	Journal	Year	Volume	Issue	#Pages	#Equations	#Figures	#Regressions	#Tables	#Appendices	Cites	Cites/year
Beyond Markets And States: Polycentric Governance Of Complex Economic Systems	Ostrom, Elinor	AER	2010	100	3	31	2	6	0	0	0	186	31.00
SOCIAL PREFERENCES, BELIEFS, AND THE DYNAMICS OF FREE RIDING IN PUBLIC GOODS EXPERIMENTS	Fischbacher, Urs; Gächter, Simon	AER	2010	100	1	15	1	2	0	2	0	158	26.33
Learning About A New Technology: Pineapple In Ghana	Conley, Timothy; Udry, Christopher	AER	2010	100	1	34	8	5	7	7	2	151	25.17
Growth In A Time Of Debt	Reinhart, Carmen; Rogoff, Kenneth	AER	2010	100	2	5	0	4	0	1	0	147	24.50
The Macroeconomic Effects Of Tax Changes: Estimates Based On A New Measure Of Fiscal Shocks	Romer, Christina; Romer, David	AER	2010	100	3	38	8	14	0	1	0	133	22.17
When Is The Government Spending Multiplier Large?	Christiano, Lawrence; Eichenbaum, Martin; Rebelo, Sergio	JPE	2011	119	1	43	63	7	0	0	0	104	20.80
Did Securitization Lead To Lax Screening? Evidence From Subprime Loans	Keys, Benjamin J.; Mukherjee, Tanmoy; Seru, Amit; Vig, Vikrant	QJE	2010	125	1	55	2	13	6	6	4	150	25

**Comprises the period from 2010 to June 1, 2015. Source: Thomson Reuters Web of Science.*

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