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**Working Paper**

## What Has Mattered to Economics Since 1970

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**Working Paper No. 212**

**“What Has Mattered to Economics Since 1970”**

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## **What Has Mattered to Economics Since 1970**

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## **ABSTRACT**

We compile the list of articles published in major refereed economics journals during the last 35 years that have received more than 500 citations. We document major shifts in the mode of contribution and in the importance of different sub-fields: Theory loses out to empirical work, and micro and macro give way to growth and development in the 1990s. While we do not witness any decline in the primacy of production in the United States over the period, the concentration of institutions within the U.S. hosting and training authors of the highly-cited articles has declined substantially.

JEL Classification: A11, O33, B20

Keywords: citations, innovations in economics

Citations are one way that past research echoes through time. Although the number of academic citations accumulated by a published research paper is an imperfect measure of quality or influence of that paper, citation counts do have certain virtues. They are not subjective. They are widely used in studies of academic productivity. They are reasonably comprehensive across subject areas within economics. In this paper, we compile a list of articles published in major refereed economics journals in the last 35 years that have received more than 500 citations as of June 2006. We then use this list to examine various trends: what economics fields and types of articles are most in vogue and which institutions host their production and train their authors.

#### How We Compiled the List

For each article published in 41 prominent economics journals between 1970 and 2002, we download citations as of June 2006 from the ISI Web of Science/Social Science Citation Index. We limit our focus to 41 journals because the Web of Science has an untenable list of 175 economics and 40 finance journals. The choice of the particular 41 journals results from the union of journals which have been used in previous studies ranking economics and finance departments and individual economists. These ranking studies, summarized in Kim, Morse, and Zingales (2006), include Arnold, Butler, Crack, and Altintig (2003), Coupe (2003), Dusansky and Vernon (1998), Graves, Marchand, and Thompson (1982), and Scott and Mitias (1996). Table 1 shows the list of 41 journals.

Our objective is to prepare a list of the articles in these journals with more than 500 cites. To do so, we make an adjustment to the downloaded citation counts to restore

omitted citations resulting from references that contain erroneous information or omit necessary information to generate a citation in the main record of the article. For example, if an issue number is omitted or incorrectly referenced, the base article may not receive credit for that citation. To ensure such underestimation does not prevent deserving articles from making the list, we identify all papers with 400 or more correctly referenced cites. Then we apply a manual count procedure. We search the cited reference database for the author last name, first initial, and year for each of 198 articles receiving more than 400 cites. When we find a citation without a linkage, we identify the appropriate article deserving the citation following a set of rules designed to minimize misidentification.<sup>1</sup>

### *The List*

Table 2 presents the resulting list of 146 articles with over 500 cites as of June 2006. The most cited article, with 4,318 cites, is Halbert White's paper on robust standard errors, followed by Daniel Kahneman and Amos Tversky's paper on prospect theory (4,085

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<sup>1</sup> If an individual has only one article for a specific journal and year, all misreferenced citations that have the correct journal and year are credited to the article. If the individual has multiple articles in the journal for the year searched, we credit all cites with the correct issue or page number to the appropriate article. For the remaining misreferences for individuals with multiple papers in the same journal year, we calculate the ratio of correct citations between the multiple articles and apply the ambiguous cases in the same proportion. These rules, however, do not capture misreferences when the last name of the author is incorrectly spelled. Because it is unlikely that the last names of all authors of a co-authored article are misspelled, we follow the same procedure used above for each co-author for each article and use the largest number of misreferenced citations as the add-on to the count. Although this procedure does not capture misspellings of the last name for solo authors, the probability of omitting an over-500-cite, solo-authored article from the list is negligible because solo authors are the focal point of references. Finally, we miss citations when the year of publication is wrong, which is rather rare.

cites) and Michael Jensen and William Meckling's paper on managerial behavior and agency costs (3,923 cites).

Within these 146 papers, an elite group of 11 economists authored or co-authored at least three papers. Robert Barro, Eugene Fama, and Joseph Stiglitz have six each. Michael Jensen follows with five; Robert Lucas and David Kreps with four; and Robert Engle, Lars Hansen, Robert Merton, Edward Prescott, and Stephen Ross have three each.

### *What Has Mattered to Economics*

This list of highly cited papers provides us with an opportunity to analyze what has mattered in economics over the last 35 years. To make comparisons over time, however, we need to correct an obvious bias: papers written in the 1970s are more likely to meet the 500 cites threshold than papers written in the 1990s. In fact, Table 2 contains 69 articles from the 1970s, 58 from the 1980s, and only 19 from the 1990s with just one after 1993. To make the comparison meaningful we lower the bar for papers written in the period 1985-1999. During the first three half decades (1970-1984), the number of over-500-cite articles hovers around 35 per half decade. Hence for the following three half decades, we compile 35 most cited papers for each half decade.<sup>2</sup>

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<sup>2</sup> To identify the additional highly cited papers we manually correct for misreferences as described earlier. We do not include papers written after 2000 because the time span is too short for references to be meaningful.

To identify fields represented by these highly cited papers, we collect the JEL code for each of the articles by looking up the reference in EconLit and recording the first JEL code listing. We condense the two-digit JEL scheme into 11 fields, generally adhering to the JEL aggregate fields.<sup>3</sup>

As Table 3.A shows, econometrics and finance are well represented throughout the period with a constant flow of highly cited papers capturing about 20% and 23%, of the most cited papers respectively. Micro and macro have a relatively prominent presence during the 1970s and the 1980s (18% and 17%, respectively), but both experience a sharp decline in the 1990s (only 9% for each). In contrast, growth/development, which makes the list only once during the 1970-1984 period, explodes in the subsequent three half-decades with shares of 14%, 20%, and 17% for these periods.

When we look at the type of contribution (Table 3.B), roughly one quarter of the most cited papers in each decade are econometric methodological contributions. With the exception of the early 1970s, this share is very constant over time. By contrast, we observe a major reversal between theoretical and empirical papers. In the early 1970s, 77% of the most highly cited papers were theoretical, while only 11% empirical. At the end of the century, 60% are empirical and only 11% theoretical. This change in theory's share might be due, at least in part, to different citation patterns for empirical and theoretical papers, with theory starting out slowly but maintaining a longer staying power. However, even when we look at the 1990-94 period, which allows papers to have

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<sup>3</sup> The 11 fields are econometrics (C except game theory), microeconomics (D), game theory (C7), macroeconomics (E), international economics (F), finance (G), public finance (H and I), labor (J), industrial organization (L), growth and development (O and P) and others (K, M, Q, and R). For a few cases without JEL codes, we applied our assessment of the article. We recoded JEL codes for two cases in which the coding was clearly not the primary subject.



at least 12 years to accumulate cites, we still find a similar albeit less accentuated trend; theory represents 40% of the papers and empirics 31% during this period.

As for the publication outlet for the most cited papers, Table 4 shows sharp changes over time. In the 1970s and 1980s, the lion's share of these papers was published in *Econometrica* (22.3%), the *Journal of Political Economy* (18.0%), and *American Economic Review* (14.4%). Particularly noteworthy is *Econometrica*'s contribution in the 1980s, peaking at nearly one-third of the articles over the decade. In the 1990s, the honor belongs to the *Quarterly Journal of Economics* (21.4%), the *Journal of Political Economy* (15.7), the *Journal of Finance* (14.3%), *Econometrica* (12.9%), and the *American Economic Review* (8.6%). Considering that the *QJE*'s share was only 4.3% in the earlier period, its ascent to the position of the primary outlet for most-cited papers is remarkable.

As Table 5.A shows, eighty-five percent of the most cited papers are written by researchers when they were working at U.S. institutions. This share does not exhibit any decline over time; in fact, it slightly increases in the last five years. Within the United States, however, the concentration declines substantially. In the 1970-74 period, almost one fourth of the most cited papers were written at the University of Chicago and only 15 institutions were represented at all. At the end of the century, however, no institution accounts for more than 16% of the market, and an impressive 26 institutions contribute to the production of highly-cited articles. The within-U.S. Herfindahl index of

concentration<sup>4</sup> declines 50% from a score of 0.096 in the early 1970s to 0.062 in the late 1990s.

This reduction in concentration within the United States is consistent with Kim, Morse, and Zingales (2006), who document a significant reduction in the local spillover (university fixed effect) of academic productivity over the last three decades. It does raise an interesting question, however: Why is this spreading out limited within the United States without benefiting Europe or the rest of the world?

The same pattern emerges if we look at where the writers of the most cited papers were trained (Table 5.B). An overwhelming majority, 87%, received their PhDs from U.S. institutions, with this percentage rising to 93% at the end of the century. As for the location within the United States, however, the concentration of the institutions granting PhDs to the authors of these papers has declined. In the early 1970s, Chicago trained 28% of the authors and 72% were trained in the top 5 schools. By the end of the century, no institution trained more than 18% of the authors, and the share of the top five has dropped to 51%.

### *Discussion*

In closing, it should be noted that our list of most-cited articles is by no means intended to represent all seminal contributions in economics. Not only does it exclude foundation books such as Adam Smith's *The Wealth of Nations* (1776) and Karl Marx's *Das Kapital* (1867), it also omits all pre-1970 papers that have received vast numbers of

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<sup>4</sup> The Herfindahl index is calculated as the sum of the participants' shares squared.

citations such as the Coase (1937) paper, Friedman’s 1967 AEA presidential address, the Modigliani and Miller (1958) irrelevance paper, and so on. To help in understanding what the list covers and what it does not, it is useful to spell out some of the consequences of the choices we made in compiling the list.

The 41 journals that we searched rely primarily on a blind refereeing process, and therefore, journals in which many or all of the papers are invited were omitted. Thus, our list of articles omits the *Journal of Economic Literature* and the *Journal of Economic Perspectives*. Nor does the list include popular economic series such as the *Carnegie-Rochester Conference Series on Public Policy*, the *NBER Macro Annual*, and the *Brookings Papers on Economic Activity*.

We suspect that adding additional journals would result in only modest changes to the list. Among the articles excluded due to our choice of economics journals, one of the most likely papers to hit the 500-cites threshold is the Robert Lucas (1977) paper on business cycles that presented the rational expectations “Lucas critique” and appeared in *Carnegie-Rochester Conference Series*. However, this paper has, by our count, 491 cites and thus would not (yet) have made the list. Our list of journals also excludes the *Journal of Economic Behavior and Organization*, which published “Toward a Positive Theory of Consumer Choice” by Richard Thaler (1980) that would have made our cut with 631 citations. Because we are reluctant to fish in all other social science fields that make interdisciplinary contributions to economics, we exclude non-economic journals such as *Marketing Science*. Unfortunately, that is where Thaler (1985) published “Mental Accounting and Consumer Choice,” which has had 541 citations.

We also exclude citations to the working paper version(s) of published papers. Published articles usually have multiple working paper versions in different years, often with different titles. The underestimation from ignoring working papers is likely to be small and roughly similar across papers. The exceptions are papers like the 1985 term structure article by Cox, Ingersoll, and Ross that took almost ten years to publication. The Web of Science has approximately 90 citations to different working paper versions under Cox's name. The published version has 819 citations, implying that the omission of citations to working paper is 10% even in this extreme case.

Finally, the Web of Science database includes citations from all social science fields – not just citations from economics journals. We do not restrict citations to those from economics journals alone because a paper's spillover to other disciplines may be an important part of its impact.

These caveats notwithstanding, our study has shown which papers have had the most impact on our profession and how demands for different subfields and modes of research have changed over time. It will be interesting to look again, a few years from now, to see what articles join the list and what new patterns emerge.

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Thaler, Richard H. 1985. "Mental Accounting and Consumer Choice." *Marketing Science*. 4: pp. 199-214.

**Table 1: Journals**

The list of 41 prominent refereed economics journals is made of the union of journals which have been used in a set of previous studies ranking economics and finance departments and individual economists during sub-periods between 1970 and 2002. These ranking studies, summarized in Kim, Morse, and Zingales (2006), include Arnold, Butler, Crack and Altintig (2003), Coupe (2003), Dusansky and Vernon (1998), Graves, Marchand and Thompson (1982), and Scott and Mitias (1996).

<i>Journals</i>	
American Economic Review	Journal of International Economics
Econometrica	Journal of International Money & Finance
Economic Development & Cultural Change	Journal of Labor Economics
Economic Inquiry	Journal of Law & Economics
Economic Journal	Journal of Law, Economics & Organization
Economica	Journal of Legal Studies
European Economic Review	Journal of Monetary Economics
Industrial & Labor Relations Review	Journal of Money, Credit & Banking
International Economic Review	Journal of Political Economy
Journal of American Statistical Association	Journal of Public Economics
Journal of Business	Journal of Regional Science
Journal of Business & Economic Statistics	Journal of Urban Economics
Journal of Development Economics	National Tax Journal
Journal of Econometrics	Oxford Economic Papers
Journal of Economic Dynamics & Control	Quarterly Journal of Economics
Journal of Economic History	Rand Journal of Economics (Bell Journal)
Journal of Economic Theory	Review of Economic Studies
Journal of Finance	Review of Economics & Statistics
Journal of Financial Economics	Review of Financial Studies
Journal of Financial & Quantitative Analysis	Southern Economic Review
Journal of Human Resources	



**Table 2: List of 1970-2005 Articles Receiving More than 500 Cites**

The list contains all articles published in 41 established refereed economics journals during 1970-2005 receiving more than 500 cites in the Web of Science/Social Science Citation Index, corrected for misreferencing errors. The list is current as of June 2006. Adjustment for misreferencing is done by manually counting the citations listed in the Web of Science for all articles with over 400 cites in the primary cite record.

<i>Authors</i>	<i>Title</i>	<i>Reference</i>	<i>Cites</i>
1. White, H. (1980)	A Heteroskedasticity-Consistent Covariance-Matrix Estimator and a Direct Test for Heteroskedasticity	Econometrica 48 (4), 817-838	4318
2. Kahneman, D., Tversky, A. (1979)	Prospect Theory - Analysis of Decision under Risk	Econometrica 47 (2), 263-291	4085
3. Jensen, M. C., Meckling, W. H. (1976)	Theory of Firm - Managerial Behavior, Agency Costs and Ownership Structure	Journal of Financial Economics 3 (4), 305-360	3923
4. Engle, R. F., Granger, C. W. J. (1987)	Cointegration and Error Correction - Representation, Estimation, and Testing	Econometrica 55 (2), 251-276	3432
5. Heckman, J. J. (1979)	Sample Selection Bias as a Specification Error	Econometrica 47 (1), 153-161	2978
6. Black, F., Scholes, M. (1973)	Pricing of Options and Corporate Liabilities	Journal of Political Economy 81 (3), 637-654	2589
7. Dickey, D. A., Fuller, W. A. (1979)	Distribution of the Estimators for Autoregressive Time-Series with a Unit Root	Journal of the American Statistical Association 74 (366), 427-431	2197
8. Johansen, S. (1988)	Statistical-Analysis of Cointegration Vectors	Journal of Economic Dynamics & Control 12 (2-3), 231-254	2145
9. Cleveland, W. S. (1979)	Robust Locally Weighted Regression and Smoothing Scatterplots	Journal of the American Statistical Association 74 (368), 829-836	2051
10. Engle, R. F. (1982)	Autoregressive Conditional Heteroscedasticity with Estimates of the Variance of United-Kingdom Inflation	Econometrica 50 (4), 987-1007	2013
11. Hausman, J. A. (1978)	Specification Tests in Econometrics	Econometrica 46 (6), 1251-1271	2001
12. Alchian, A. A., Demsetz, H. (1972)	Production, Information Costs, and Economic Organization	American Economic Review 62 (5), 777-795	1880
13. Akerlof, G. A. (1970)	Market for Lemons - Quality Uncertainty and Market Mechanism	Quarterly Journal of Economics 84 (3), 488-500	1844
14. Stigler, G. J. (1971)	Theory of Economic Regulation	Bell Journal of Economics and Management Science 2 (1), 3-21	1831
15. Lucas, R. E. (1988)	On the Mechanics of Economic-Development	Journal of Monetary Economics 22 (1), 3-42	1772
16. Romer, P. M. (1986)	Increasing Returns and Long-Run Growth	Journal of Political Economy 94 (5), 1002-1037	1640
17. Hansen, L. P. (1982)	Large Sample Properties of Generalized-Method of Moments Estimators	Econometrica 50 (4), 1029-1054	1620
18. Dickey, D. A.,	Likelihood Ratio Statistics for	Econometrica 49 (4),	1596

Fuller, W. A. (1981)	Autoregressive Time-Series with a Unit-Root	1057-1072	
19. Newey, W. K., West, K. D. (1987)	A Simple, Positive Semidefinite, Heteroskedasticity and Autocorrelation Consistent Covariance-Matrix	Econometrica 55 (3), 703-708	1566
20. Fama, E. F. (1970)	Efficient Capital Markets - Review of Theory and Empirical Work	Journal of Finance 25 (2), 383-423	1554
21. Rosen, S. (1974)	Hedonic Prices and Implicit Markets - Product Differentiation in Pure Competition	Journal of Political Economy 82 (1), 34-55	1398
22. Romer, P. M. (1990)	Endogenous Technological-Change	Journal of Political Economy 98 (5), S71-S102	1333
23. Sims, C. A. (1980)	Macroeconomics and Reality	Econometrica 48 (1), 1-48	1332
24. Bollerslev, T. (1986)	Generalized Autoregressive Conditional Heteroskedasticity	Journal of Econometrics 31 (3), 307-327	1314
25. Merton, R. C. (1973)	Theory of Rational Option Pricing	Bell Journal of Economics 4 (1), 141-183	1228
26. Jensen, M. C. (1986)	Agency Costs of Free Cash Flow, Corporate-Finance, and Takeovers	American Economic Review 76 (2), 323-329	1225
27. Peltzman, S. (1976)	Toward a More General Theory of Regulation	Journal of Law and Economics 19 (2), 211-240	1214
28. Barro, R. J. (1974)	Are Government Bonds Net Wealth	Journal of Political Economy 82 (6), 1095-1117	1209
29. Nelson, C. R., Plosser, C. I. (1982)	Trends and Random-Walks in Macroeconomic Time-Series - Some Evidence and Implications	Journal of Monetary Economics 10 (2), 139-162	1198
30. Klein, B., Crawford, R. G., Alchian, A. A. (1978)	Vertical Integration, Appropriable Rents, and the Competitive Contracting Process	Journal of Law & Economics 21 (2), 297-326	1160
31. Myers, S. C., Majluf, N. S. (1984)	Corporate Financing and Investment Decisions When Firms Have Information That Investors Do Not Have	Journal of Financial Economics 13 (2), 187-221	1137
32. Stiglitz, J. E. Weiss, A. (1981)	Credit Rationing in Markets with Imperfect Information	American Economic Review 71 (3), 393-410	1122
33. Barro, R. J. (1991)	Economic-Growth in a Cross-Section of Countries	Quarterly Journal of Economics 106 (2), 407-443	1111
34. Fama, E. F. (1980)	Agency Problems and the Theory of the Firm	Journal of Political Economy 88 (2), 288-307	1091
35. Dornbusch, R. (1976)	Expectations and Exchange-Rate Dynamics	Journal of Political Economy 84 (6), 1161-1176	1074
36. Atkinson, A. B. (1970)	Measurement of Inequality	Journal of Economic Theory 2 (3), 244-263	1071
37. Summers, R., Heston, A. (1991)	The Penn World Table (Mark-5) - an Expanded Set of International Comparisons, 1950-1988	Quarterly Journal of Economics 106 (2), 327-368	1070
38. Rothschild, M., Stiglitz, J. E. (1970)	Increasing Risk .I. Definition	Journal of Economic Theory 2 (3), 225-243	1060
39. Holmstrom, B. (1979)	Moral Hazard and Observability	Bell Journal of Economics 10 (1), 74-91	1041

40. Johansen, S. (1991)	Estimation and Hypothesis-Testing of Cointegration Vectors in Gaussian Vector Autoregressive Models	Econometrica 59 (6), 1551-1580	1020
41. Williamson, O. E. (1979)	Transaction-Cost Economics - Governance of Contractual Relations	Journal of Law & Economics 22 (2), 233-261	1019
42. Kydland, F. E., Prescott, E. C. (1977)	Rules Rather Than Discretion - Inconsistency of Optimal Plans	Journal of Political Economy 85 (3), 473-491	1015
43. Fama, E. F., Jensen, M. C. (1983)	Separation of Ownership and Control	Journal of Law & Economics 26 (2), 301-325	1002
44. Becker, G. S. (1983)	A Theory of Competition among Pressure Groups for Political Influence	Quarterly Journal of Economics 98 (3), 371-400	985
45. Waksberg, J. (1978)	Sampling Methods for Random Digit Dialing	Journal of the American Statistical Association 73 (361), 407-443	983
46. Dixit, A. K., Stiglitz, J. E. (1977)	Monopolistic Competition and Optimum Product Diversity	American Economic Review 67 (3), 297-308	983
47. Perron, P. (1989)	The Great Crash, the Oil Price Shock, and the Unit-Root Hypothesis	Econometrica 57 (6), 1361-1401	965
48. Grossman, S. J. Hart, O. D. (1986)	The Costs and Benefits of Ownership - a Theory of Vertical and Lateral Integration	Journal of Political Economy 94 (4), 691-719	955
49. White, H. (1982)	Maximum-Likelihood Estimation of Mis-Specified Models	Econometrica 50 (1), 1-25	953
50. Milgrom, P. R., Weber, R. J. (1982)	A Theory of Auctions and Competitive Bidding	Econometrica 50 (5), 1089-1122	929
51. Sims, C. A. (1972)	Money, Income, and Causality	American Economic Review 62 (4), 540-552	914
52. Lucas, R. E. (1973)	Some International Evidence on Output-Inflation Tradeoffs	American Economic Review 63 (3), 326-334	907
53. Rubinstein, A. (1982)	Perfect Equilibrium in a Bargaining Model	Econometrica 50 (1), 97-109	889
54. Fama, E. F., Macbeth, J. D. (1973)	Risk, Return, and Equilibrium - Empirical Tests	Journal of Political Economy 81 (3), 607-636	883
55. Harris, J. R., Todaro, M. P. (1970)	Migration, Unemployment and Development - 2-Sector Analysis	American Economic Review 60 (1), 126-142	880
56. Myers, S. C. (1977)	Determinants of Corporate Borrowing	Journal of Financial Economics 5 (2), 147-175	879
57. Shapiro, C., Stiglitz, J. E. (1984)	Equilibrium Unemployment as a Worker Discipline Device	American Economic Review 74 (3), 433-444	856
58. Lucas, R. E. (1972)	Expectations and Neutrality of Money	Journal of Economic Theory 4 (2), 103-124	838
59. Klein, B., Leffler, K. B. (1981)	The Role of Market Forces in Assuring Contractual Performance	Journal of Political Economy 89 (4), 615-641	824
60. Cox, J. C., Ingersoll, J. E., Ross, S. A. (1985)	A Theory of the Term Structure of Interest-Rates	Econometrica 53 (2), 385-407	819
61. Kydland, F. E., Prescott, E. C. (1982)	Time to Build and Aggregate Fluctuations	Econometrica 50 (6), 1345-1370	814
62. Merton, R. C. (1973)	Intertemporal Capital Asset Pricing Model	Econometrica 41 (5), 867-887	793
63. Rothschild, M., Stiglitz, J. (1976)	Equilibrium in Competitive Insurance Markets - Essay on Economics of Imperfect Information	Quarterly Journal of Economics 90 (4), 629-649	793

64. Phillips, P. C. B. (1987)	Time-Series Regression with a Unit-Root	Econometrica 55 (2), 277-301	792
65. Mankiw, N. G., Romer, D., Weil, D. N. (1992)	A Contribution to the Empirics of Economic-Growth	Quarterly Journal of Economics 107 (2), 407-437	792
66. Hall, R. E. (1978)	Stochastic Implications of the Life Cycle Permanent Income Hypothesis - Theory and Evidence	Journal of Political Economy 86 (6), 971-987	791
67. Levine, R., Renelt, D. (1992)	A Sensitivity Analysis of Cross-Country Growth Regressions	American Economic Review 82 (4), 942-963	787
68. Krueger, A. O. (1974)	Political Economy of Rent-Seeking Society	American Economic Review 64 (3), 291-303	784
69. Merton, R. C. (1971)	Optimum Consumption and Portfolio Rules in a Continuous-Time Model	Journal of Economic Theory 3 (4), 373-413	775
70. Lucas, R. E. (1978)	Asset Prices in an Exchange Economy	Econometrica 46 (6), 1429-1445	772
71. Deaton, A., Muellbauer, J. (1980)	An Almost Ideal Demand System	American Economic Review 70 (3), 312-326	732
72. Hamilton, J. D. (1989)	A New Approach to the Economic-Analysis of Nonstationary Time-Series and the Business-Cycle	Econometrica 57 (2), 357-384	731
73. Box, G. E. P., Tiao, G. C. (1975)	Intervention Analysis with Applications to Economic and Environmental Problems	Journal of the American Statistical Association 70 (349), 70-79	726
74. Kyle, A. S. (1985)	Continuous Auctions and Insider Trading	Econometrica 53 (6), 1315-1335	724
75. Harville, D. A. (1977)	Maximum Likelihood Approaches to Variance Component Estimation and to Related Problems	Journal of the American Statistical Association 72 (358), 320-338	722
76. Stigler, G. J., Becker, G. S. (1977)	De Gustibus Non Est Disputandum	American Economic Review 67 (2), 76-90	719
77. Nelson, P. (1970)	Information and Consumer Behavior	Journal of Political Economy 78 (2), 311-329	719
78. Holmstrom, B. (1982)	Moral Hazard in Teams	Bell Journal of Economics 13 (2), 324-340	716
79. Kreps, D. M., Wilson, R. (1982)	Sequential Equilibria	Econometrica 50 (4), 863-894	715
80. Diamond, D. W. (1984)	Financial Intermediation and Delegated Monitoring	Review of Economic Studies 51 (3), 393-414	711
81. Fama, E. F., French, K. R. (1992)	The Cross-Section of Expected Stock Returns	Journal of Finance 47 (2), 427-465	703
82. Grossman, S. J., Stiglitz, J. E. (1980)	On the Impossibility of Informationally Efficient Markets	American Economic Review 70 (3), 393-408	669
83. Jensen, M. C., Ruback, R. S. (1983)	The Market for Corporate-Control - the Scientific Evidence	Journal of Financial Economics 11 (1-4), 5-50	665
84. Fischer, S. (1977)	Long-Term Contracts, Rational Expectations, and Optimal Money Supply Rule	Journal of Political Economy 85 (1), 191-205	663
85. Mehra, R., Prescott, E. C. (1985)	The Equity Premium - a Puzzle	Journal of Monetary Economics 15 (2), 145-161	662
86. Kwiatkowski, D., Phillips, P. C.	Testing the Null Hypothesis of Stationarity against the Alternative of a	Journal of Econometrics 54 (1-3), 159-178	662

B.Schmidt, P. Shin, Y. C. (1992)	Unit-Root - How Sure Are We That Economic Time-Seri		
87. Spence, M. (1973)	Job Market Signaling	Quarterly Journal of Economics 87 (3), 355-374	660
88. Ross, S. A. (1976)	Arbitrage Theory of Capital Asset Pricing	Journal of Economic Theory 13 (3), 341-360	659
89. David, P. A. (1985)	Clio and the Economics of Qwerty	American Economic Review 75 (2), 332-337	652
90. Krugman, P. (1991)	Increasing Returns and Economic-Geography	Journal of Political Economy 99 (3), 483-499	649
91. Sargent, T. J., Wallace, N. (1975)	Rational Expectations, Optimal Monetary Instrument, and Optimal Money Supply Rule	Journal of Political Economy 83 (2), 241-254	646
92. Bollerslev, T., Chou, R. Y., Kroner, K. F. (1992)	Arch Modeling in Finance - a Review of the Theory and Empirical-Evidence	Journal of Econometrics 52 (1-2), 5-59	646
93. Arthur, W. B. (1989)	Competing Technologies, Increasing Returns, and Lock-in by Historical Events	Economic Journal 99(394), 116-131	645
94. Harrison, J. M. Kreps, D. M. (1979)	Martingales and Arbitrage in Multiperiod Securities Markets	Journal of Economic Theory 20 (3), 381-408	641
95. Barro, R. J., Gordon, D. B. (1983)	Rules, Discretion and Reputation in a Model of Monetary-Policy	Journal of Monetary Economics 12 (1), 101-121	640
96. Diamond, D. W., Dybvig, P. H. (1983)	Bank Runs, Deposit Insurance, and Liquidity	Journal of Political Economy 91 (3), 401-419	640
97. Sandmo, A. (1971)	Theory of Competitive Firm under Price Uncertainty	American Economic Review 61 (1), 65-73	623
98. Arellano, M., Bond, S. (1991)	Some Tests of Specification for Panel Data - Monte-Carlo Evidence and an Application to Employment Equations	Review of Economic Studies 58(2), 277-297	615
99. Engle, R. F., Yoo, B. S. (1987)	Forecasting and Testing in Co-Integrated Systems	Journal of Econometrics 35 (1), 143-159	613
100. Brown, S. J., Warner, J. B. (1985)	Using Daily Stock Returns - the Case of Event Studies	Journal of Financial Economics 14 (1), 3-31	608
101. Katz, M. L., Shapiro, C. (1985)	Network Externalities, Competition, and Compatibility	American Economic Review 75 (3), 424-440	606
102. Jensen, M. C., Murphy, K. J. (1990)	Performance Pay and Top-Management Incentives	Journal of Political Economy 98 (2), 225-264	605
103. Davidson, R., Mackinnon, J. G. (1981)	Several Tests for Model-Specification in the Presence of Alternative Hypotheses	Econometrica 49 (3), 781-793	604
104. Kreps, D. M., Wilson, R. (1982)	Reputation and Imperfect Information	Journal of Economic Theory 27 (2), 253-279	601
105. Leland, H. E., Pyle, D. H. (1977)	Informational Asymmetries, Financial Structure, and Financial Intermediation	Journal of Finance 32 (2), 371-387	594
106. Hansen, L. P., Hodrick, R. J. (1980)	Forward Exchange-Rates as Optimal Predictors of Future Spot Rates - an Econometric-Analysis	Journal of Political Economy 88 (5), 829-853	591
107. Katz, L. F., Murphy, K. M. (1992)	Changes in Relative Wages, 1963-1987 - Supply-and-Demand Factors	Quarterly Journal of Economics 107 (1), 35-78	591
108. Cohen, W. M., Levinthal, D. A. (1989)	Innovation and Learning - the 2 Faces of R-and-D	Economic Journal 99(397), 569-596	588
109. Fama, E. F., French, K. R. (1993)	Common Risk-Factors in the Returns on Stocks and Bonds	Journal of Financial Economics 33 (1), 3-56	585

110. Christensen, L. Jorgenson, D., Lau, L. J. (1973)	Transcendental Logarithmic Production Frontiers	Review of Economics and Statistics 55 (1), 28-45	583
111. Heckman, J., Singer, B. (1984)	A Method for Minimizing the Impact of Distributional Assumptions in Econometric-Models for Duration Data	Econometrica 52 (2), 271-320	575
112. Barro, R. J., Salaimartin, X. (1992)	Convergence	Journal of Political Economy 100 (2), 223-251	572
113. Mirrlees, J. A. (1971)	Exploration in Theory of Optimum Income Taxation	Review of Economic Studies 38 (114), 175-208	571
114. Glosten, L. R., Milgrom, P. R. (1985)	Bid, Ask and Transaction Prices in a Specialist Market with Heterogeneously Informed Traders	Journal of Financial Economics 14 (1), 71-100	571
115. Roll, R. (1977)	Critique of Asset Pricing Theory Tests .1. Past and Potential Testability of Theory	Journal of Financial Economics 4 (2), 129-176	570
116. Nordhaus, W. D. (1975)	Political Business Cycle	Review of Economic Studies 42(2), 169-190	570
117. Scholes, M., Williams, J. (1977)	Estimating Betas from Nonsynchronous Data	Journal of Financial Economics 5 (3), 309-327	567
118. Hansen, L. P., Singleton, K. J. (1982)	Generalized Instrumental Variables Estimation of Non-Linear Rational-Expectations Models	Econometrica 50 (5), 1269-1286	565
119. Nelson, P. (1974)	Advertising as Information	Journal of Political Economy 82 (4), 729-754	560
120. Meese, R. A., Rogoff, K. (1983)	Empirical Exchange-Rate Models of the Seventies - Do They Fit out of Sample	Journal of International Economics 14 (1-2), 3-24	560
121. Cox, J. C., Ross, S. A., Rubinstein, M. (1979)	Option Pricing - Simplified Approach	Journal of Financial Economics 7 (3), 229-263	557
122. La Porta, R., Lopez-De-Silanes, Shleifer, A. Vishny, R. W. (1998)	Law and Finance	Journal of Political Economy 106 (6), 1113-1155	554
123. Barro, R. J., Gordon, D. B. (1983)	A Positive Theory of Monetary-Policy in a Natural Rate Model	Journal of Political Economy 91 (4), 589-610	552
124. Lazear, E. P., Rosen, S. (1981)	Rank-Order Tournaments as Optimum Labor Contracts	Journal of Political Economy 89 (5), 841-864	546
125. Nelson, D. B. (1991)	Conditional Heteroskedasticity in Asset Returns - a New Approach	Econometrica 59 (2), 347-370	544
126. Cho, I. K., Kreps, D. M. (1987)	Signaling Games and Stable Equilibria	Quarterly Journal of Economics 102 (2), 179-221	544
127. Andrews, D. W. K. (1991)	Heteroskedasticity and Autocorrelation Consistent Covariance-Matrix Estimation	Econometrica 59 (3), 817-858	542
128. Vasicek, O. (1977)	Equilibrium Characterization of Term Structure	Journal of Financial Economics 5 (2), 177-188	538
129. Davidson, J. E. Hendry, D. F., Srba, F., Yeo, S. (1978)	Econometric Modeling of the Aggregate Time-Series Relationship between Consumers Expenditure and Income in the United-Kingdo	Economic Journal 88(352), 661-692	537
130. Stephens, M. A. (1974)	Edf Statistics for Goodness of Fit and Some Comparisons	Journal of the American Statistical Association 69 (347), 730-737	535



131. Durbin, J. (1970)	Testing for Serial Correlation in Least-Squares Regression When Some of Regressors Are Lagged Dependent Variables	Econometrica 38 (3), 410-&	534
132. Breusch, T. S., Pagan, A. R. (1979)	Simple Test for Heteroscedasticity and Random Coefficient Variation	Econometrica 47 (5), 1287-1294	532
133. Koenker, R., Bassett, G. (1978)	Regression Quantiles	Econometrica 46 (1), 33-50	531
134. Shiller, R. J. (1981)	Do Stock-Prices Move Too Much to Be Justified by Subsequent Changes in Dividends	American Economic Review 71 (3), 421-436	527
135. Gibbard, A. (1973)	Manipulation of Voting Schemes - General Result	Econometrica 41 (4), 587-601	522
136. Jaffe, A. B., Trajtenberg, M., Henderson, R. (1993)	Geographic Localization of Knowledge Spillovers as Evidenced by Patent Citations	Quarterly Journal of Economics 108 (3), 577-598	521
137. Miller, M. H. (1977)	Debt and Taxes	Journal of Finance 32 (2), 261-275	515
138. Blinder, A. S. (1973)	Wage Discrimination - Reduced Form and Structural Estimates	Journal of Human Resources 8 (4), 436-455	515
139. Ehrlich, I. (1973)	Participation in Illegitimate Activities - Theoretical and Empirical Investigation	Journal of Political Economy 81 (3), 521-565	513
140. Berndt, E. R., Wood, D. O. (1975)	Technology, Prices, and Derived Demand for Energy	Review of Economics and Statistics 57 (3), 259-268	513
141. Barro, R. J. (1977)	Unanticipated Money Growth and Unemployment in United-States	American Economic Review 67 (2), 101-115	513
142. Posner, R. A. (1974)	Theories of Economic Regulation	Bell Journal of Economics 5 (2), 335-358	511
143. Breeden, D. T. (1979)	Intertemporal Asset Pricing Model with Stochastic Consumption and Investment Opportunities	Journal of Financial Economics 7 (3), 265-296	510
144. Loomes, G., Sugden, R. (1982)	Regret Theory - an Alternative Theory of Rational Choice under Uncertainty	Economic Journal 92(368), 805-824	508
145. Azariadis, C. (1975)	Implicit Contracts and Underemployment Equilibria	Journal of Political Economy 83 (6), 1183-1202	508
146. Rogoff, K. (1985)	The Optimal Degree of Commitment to an Intermediate Monetary Target	Quarterly Journal of Economics 100 (4), 1169-1189	506

**Table 3: Percent of Highly-Cited Articles by Sub-Field and Contribution Type over Half-Decades**

***Panel A***

This panel presents the percentage of highly-cited articles published in each economic field by half-decade. Economic fields are assigned according to the one-digit JEL code as reported in the EconLit reference for each article, with a few exceptions. We allow game theory (JEL classification C7) to be its own field. Development (P) and growth (O) are combined. The “Other” category contains law and economics (K), business administration (M), agricultural, resource and environmental economics (Q), and urban, rural and regional economics (R). For a few cases with no JEL codes, we applied our assessment of the article. We recoded JEL codes for two cases in which the coding was clearly not the primary subject. JEL one-digit categories not listed below are not found in the data. The counts of articles for each field and half-decade are in parentheses.

<i>Economic Field (JEL primary code)</i>	<i>1970- 1974</i>	<i>1975- 1979</i>	<i>1980- 1984</i>	<i>1985- 1989</i>	<i>1990- 1994</i>	<i>1995- 1999</i>	<i>Total</i>
Econometrics (C) (except C7)	10.0% (3)	20.5% (8)	20.0% (7)	22.9% (8)	17.1% (6)	22.9% (8)	19.14% (40)
Game Theory (C7)	--	--	5.7 (2)		5.7 (2)		1.91% (4)
Microeconomics (D)	26.7 (8)	15.4 (6)	22.9 (8)	11.4 (4)	17.1 (6)		15.31% (32)
Macroeconomics (E)	10.0 (3)	20.5 (8)	22.9 (8)	14.3 (5)	5.7 (2)	11.4 (4)	14.35% (30)
International Economics (F)	3.3 (1)	--	2.9 (1)				0.96% (2)
Finance (G)	20.0 (6)	25.6 (10)	20.0 (7)	22.9 (8)	20.0 (7)	31.4 (11)	23.44% (49)
Public Economics (H)	6.7 (2)	2.6 (1)	--	2.9 (1)			1.91% (4)
Labor (J)	6.7 (2)	2.6 (1)	2.9 (1)		5.7 (2)		2.87% (6)
Industrial Organization (L)	10.0 (3)	7.7 (3)	2.9 (1)	11.4 (4)	2.9 (1)	8.6 (3)	7.18% (15)
Growth/Development (O,P)	--	2.6 (1)	--	14.3 (5)	20.0 (7)	17.1 (6)	9.09% (19)
Other (K,M,Q,R)	6.7 (2)	2.6 (1)	--		5.7 (2)	8.6 (3)	3.83% (8)
Observations Total	30	39	35	23	20	27	209



***Panel B***

This panel presents the percentage of highly-cited articles whose primary contribution is in econometric methodology, empirical results, survey, theory and experiments by half-decade. The grouping is based on the authors' collective familiarity with the articles or a quick reading of articles. The counts of articles for each contribution type and half-decade are in parentheses.

<i>Main Contribution</i>	<i>1970- 1974</i>	<i>1975- 1979</i>	<i>1980- 1984</i>	<i>1985- 1989</i>	<i>1990- 1994</i>	<i>1995- 1999</i>	<i>Total</i>
Methodological	6.7% (2)	28.2% (11)	28.6% (10)	28.6% (10)	22.9% (8)	22.9% (8)	23.4% (49)
Empirical	13.3 (4)	10.3 (4)	11.4 (4)	25.7 (9)	31.4 (11)	60.0 (21)	25.4 (53)
Survey	3.3 (1)	--	2.9 (1)	--	2.9 (1)	5.7 (2)	2.4 (5)
Theoretical	76.7 (23)	61.5 (24)	57.1 (20)	42.9 (15)	40.0 (14)	11.4 (4)	48.7 (100)
Experimental	--	--	--	2.9 (1)	2.9 (1)	-	1.0 (2)
Observations Total	30	39	35	35	35	35	209

**Table 4: Percent of Highly-Cited Articles in Each Journal by Half-Decade**

Presented is the percentage of highly-cited articles by Journal for each half-decade. The counts of articles for each journal and half-decade are in parentheses.

<i>Journal</i>	<i>1970- 1974</i>	<i>1975- 1979</i>	<i>1980- 1984</i>	<i>1985- 1989</i>	<i>1990- 1994</i>	<i>1995- 1999</i>	<i>Total</i>
American Economic Review	20.0% (6)	7.7% (3)	14.3% (5)	17.1% (6)	5.7% (2)	11.4% (4)	12.4% (26)
Bell Journal of Economics	10.0 (3)	2.6 (1)	2.9 (1)				2.4 (5)
Econometrica	10.0 (3)	15.4 (6)	37.1 (13)	25.7 (9)	17.1 (6)	8.6 (3)	19.1 (40)
Economic Journal		2.6 (1)	2.9 (1)	5.7 (2)			1.9 (4)
European Economic Review						2.9 (1)	0.5 (1)
Industrial & Labor Relations Review					2.9 (1)	2.9 (1)	1.0 (2)
Journal of Business & Economic Statistics					2.9 (1)	2.9 (1)	1.0 (2)
Journal of Econometrics				5.7 (2)	5.7 (2)		1.9 (4)
Journal of Economic Dynamics & Control				2.9 (1)			0.5 (1)
Journal of Economic Theory	13.3 (4)	5.1 (2)	2.9 (1)				3.3 (7)
Journal of Finance	3.3 (1)	5.1 (2)		2.9 (1)	8.6 (3)	20.0 (7)	6.7 (14)
Journal of Financial Economics		17.9 (7)	5.7 (2)	8.6 (3)	2.9 (1)	5.7 (2)	7.2 (15)
Journal of Human Resources	3.3 (1)						0.5 (1)
Journal of International Economics			2.9 (1)				0.5 (1)
Journal of Law & Economics		7.7 (3)	2.9 (1)				1.9 (4)
Journal of Law Economics & Organization					2.9 (1)		0.5 (1)
Journal of Monetary Economics			5.7 (2)	8.6 (3)			2.4 (5)
Journal of Money Credit and Banking						2.9 (1)	0.5 (1)
Journal of Political Economy	23.3 (7)	15.4 (6)	17.1 (6)	17.1 (6)	25.7 (9)	5.7 (2)	17.2 (36)
Journal of the American Statistical Association	3.3 (1)	12.8 (5)				14.3 (5)	5.3 (22)
Quarterly Journal of Economics	6.7 (2)	2.6 (1)	2.9 (1)	5.7 (2)	20.0 (7)	22.9 (8)	10.0 (21)
Review of Economic Studies	3.3 (1)	2.6 (1)	2.9 (1)		5.7 (2)		2.4 (5)
Review of Economics and Statistics	3.3 (1)	2.6 (1)					1.0 (2)

**Table 5: Institutional Breakdown of Highly-Cited Articles by Half-Decade****Panel A**

This panel shows the percentage breakdown of institutions in which the authors resided during the time of writing the highly-cited articles. We take the institutional affiliation lagged back two years from the publication year to account for the publishing process time. The affiliations are weighted by the number of coauthors on each article.

<i>Hosting Institution</i>	<i>1970-1974</i>	<i>1975-1979</i>	<i>1980-1984</i>	<i>1985-1989</i>	<i>1990-1994</i>	<i>1995-1999</i>	<i>Total</i>
MIT	13.3%	9.8%	2.9%	8.3%	8.4%	3.5%	7.6%
Harvard	2.8	--	--	4.9	15.2	15.9	6.3
Total Cambridge	16.1	9.8	2.9	13.2	23.6	19.4	13.9
University of Chicago	23.3	21.2	18.6	9.8	16.2	11.2	16.7
Northwestern	--	--	5.7	1.5	3.9	4.0	2.5
Total Chicago	23.3	21.2	24.3	11.2	20.1	15.1	19.2
Stanford	4.4	5.1	5.7	9.5	3.7	1.5	5.0
Berkley	3.3	4.3	2.9	2.9	5.4	--	3.2
Total Bay Area	7.8	9.4	8.6	12.5	9.1	1.5	8.2
Rochester	3.3	6.4	12.9	4.4	4.4	--	5.4
Yale	1.7	4.7	1.4	8.6	9.1	2.0	4.6
University of Pennsylvania	--	5.1	4.3	--	3.4	8.9	3.7
Carnegie-Mellon	6.7	--	10.0	4.4	--	2.5	3.8
Princeton	5.0	1.3	1.4	4.4	3.9	1.5	2.8
Total Mid-Atlantic Area	16.7	17.5	30.0	21.8	20.9	14.9	20.3
Rest of the US	21.1	22.2	20.0	27.4	11.8	38.7	23.5
England	10.0	4.5	7.1	0.7	6.6	3.0	4.7
Rest of Europe	3.3	10.3	2.9	7.3	3.9	1.5	5.0
Rest of the World	1.7	1.3	4.3	5.9	2.5	6.0	3.6

### Panel B

This panel shows the percentage breakdown of Ph.D. granting institutions for the authors contributing to the highly-cited articles.

<i>Ph.D. Institution</i>	<i>1970-1974</i>	<i>1975-1979</i>	<i>1980-1984</i>	<i>1985-1989</i>	<i>1990-1994</i>	<i>1995-1999</i>	<i>Total</i>
MIT	15.6%	12.8%	13.8%	13.6%	16.7%	18.0%	15.1%
Harvard	18.8	8.5	20.7	8.5	13.3	18.0	14.5
Total Cambridge	34.4	21.3	34.5	22.0	30.0	36.1	29.7
University of Chicago	28.1	17.0	12.1	15.3	15.0	11.5	15.5
Northwestern	6.3	--	--	--	3.3	--	1.3
Total Chicago	34.4	17.0	12.1	15.3	18.3	11.5	16.7
Stanford	3.1	12.8	6.9	10.2	11.7	1.6	7.9
Berkley	3.1	--	3.4	1.7	5.0	1.6	2.5
UCLA		2.1	3.4	1.7		1.6	1.6
Total California	6.3	14.9	13.8	13.6	16.7	4.9	12.0
Carnegie-Mellon	0.0	4.3	0.0	8.5	3.3	4.9	3.8
Princeton		6.4	3.4	1.7	1.7	6.6	3.5
Yale		4.3	5.2	1.7	3.3	3.3	3.2
Cornell		4.3		1.7	3.3		1.6
University of Rochester		2.1	3.4		3.3	1.6	1.9
Total Mid-Atlantic	0.0	17.0	12.1	5.1	11.7	11.5	10.1
University of Michigan	3.1		1.7	5.1	1.7	1.6	2.2
University of Wisconsin	3.1	6.4	0.0	1.7	0.0	3.3	2.2
Washington Univ St Louis					5.0	1.6	1.3
Iowa State		4.3		3.4			1.3
Total Other Midwest	6.3	10.6	1.7	10.2	6.7	6.6	6.9
Rest of the US	6.3	6.4	10.3	13.6	8.3	23.0	12.0
England	6.3	4.3	5.2	5.1	5.0	6.6	5.4
Rest of Europe	3.1	2.1	1.7	1.7	1.7	--	1.6
Rest of the World	--	2.1	--	5.1	--	--	1.3