

100 YEARS OF THE AMERICAN ECONOMIC REVIEW: THE TOP 20 ARTICLES

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The Top 20 Committee, consisting of Kenneth J. Arrow, B. Douglas Bernheim, Martin S. Feldstein, Daniel L. McFadden, James M. Poterba, and Robert M. Solow, was appointed by Robert Moffitt with the task of selecting the “Top 20” articles published in the *American Economic Review* during its first hundred years. We decided against trying to define formally the criteria for inclusion: they surely comprise sheer intellectual quality, influence on the ideas and practices of economists, and general significance or breadth; but it would be fruitless to try to specify the marginal rates of substitution among these and other qualities. We were looking for 20 admirable and important articles.

As a starting point we used citation counts and numbers of searches in JSTOR. This is obviously important and relevant information, but not decisive on its own. Citation counts are biased in favor of subfields of economics with the largest populations. There is also a bias in favor of moderately recent articles, if only because the number of potential readers and writers has been increasing in time; very recent articles suffer from the fact that citations build up over time. In any case we were expected to use our judgment about quality and significance. So we used the citation and JSTOR data only to give us a large group of eligibles. We worried especially about overlooking articles in the very early days of the *AER*, some by great names in the history of economics. But we found, just to take one striking example, that although Irving Fisher published several articles in the journal, they were all minor or ephemeral pieces.

In the event, our early ballots showed an encouraging unanimity or near-unanimity, especially about the leading candidates. We very quickly converged on the Top 15 articles. There were occasional differences of opinion, only to be expected from a group with diverse interests, as we filled in the remaining three to five places. Here is our final list, arranged alphabetically, along with a brief reminder about each. There are few, if any, surprises.

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Alchian, Armen A., and Harold Demsetz. 1972. "Production, Information Costs, and Economic Organization." *American Economic Review*, 62(5): 777–95.

What is the special role of the firm in organizing production? The authors argue that it is the ability to measure inputs and their productivity and to allocate hired resources in production involving the cooperation of many inputs. It is this phenomenon that explains why all cooperation of factors does not take place through market-determined contracts. The firm is made to be the residual claimant because that approach creates the appropriate incentives for management. Many implications of this hypothesis are developed.

Arrow, Kenneth J. 1963. "Uncertainty and the Welfare Economics of Medical Care." *American Economic Review*, 53(5): 941–73.

This paper provided a framework for thinking about the economics of the market for medical care using the language and tools of modern microeconomics. It argued that the aforementioned market is beset by market failures because consumers are exposed to risks that are not fully insurable (in large part due to problems of moral hazard), and because they lack the information and expertise required to assess risks and treatments. It hypothesized that various salient features of the institutions governing the provision of medical care are best understood as social adaptations aimed at redressing the resulting inefficiencies. It also noted that in some cases those institutional adaptations undermine competition and perversely contribute to inefficiency. Though written well prior to the emergence of the formal literature on asymmetric information, the paper anticipated many of the central issues that continue to occupy health economists today.

Cobb, Charles W. and Paul H. Douglas. 1928. "A Theory of Production." *American Economic Review*, 18(1): 139–65.

The cliché surely applies here: this paper needs no introduction. The convenience and success of the constant-elasticity Cobb-Douglas function has spread its use from representing production possibilities, which was of course its original use, to representing utility functions and to much else throughout empirical and theoretical economics. Cobb and Douglas explored the elementary properties and implications of the functional form, and pointed to the approximate constancy of the relative shares of labor and capital in total income as the validating empirical fact.

Deaton, Angus S., and John Muellbauer. 1980. "An Almost Ideal Demand System." *American Economic Review*, 70(3): 312–26.

A vast industry in applied econometrics analyzes the demand for specific products, and the impact on consumers of public and private policies that alter market equilibrium. This paper, building on the traditions of Cobb-Douglas, Stone, and Gorman, introduces a practical system of demand equations that are consistent with preference maximization and have sufficient flexibility to support full welfare analysis of policies that have an impact on consumers. The Deaton-Muellbauer system is now the standard for empirical analysis of consumer demand.

Diamond, Peter A. 1965. "National Debt in a Neoclassical Growth Model." *American Economic Review*, 55(5): 1126–50.

Building on Paul Samuelson's seminal work concerning consumption loans between individuals of different generations, this paper pioneered the analysis of overlapping generations (OLG) models with durable capital goods. It illuminated the properties of such models through two fundamental contributions. First, it demonstrated that the competitive equilibria of infinite horizon OLG models can be inefficient, even in the absence of conventional market failures. Second, it identified the mechanisms through which both external and internal debt can potentially reduce the capital stock. In clarifying the general equilibrium effects of displacing physical capital with government debt in individuals' portfolios, it resolved a long-standing debate concerning the feasibility of using internal debt to shift the burden of paying for public expenditures to future generations.

Diamond, Peter A., and James A. Mirrlees. 1971. "Optimal Taxation and Public Production I: Production Efficiency." *American Economic Review*, 61(1): 8–27.

Diamond, Peter A., and James A. Mirrlees. 1971. "Optimal Taxation and Public Production II: Tax Rules." *American Economic Review*, 61(3): 261–78.

This paper, in two parts, is the foundation of the theory of optimal taxation and public production in the presence of second-best limitations on redistribution and private production. Diamond and Mirrlees show how the tax system can be tuned to minimize distortions and disincentives, and eliminate production inefficiencies. By subjecting tax systems to rigorous microeconomic analysis, this paper opened research on tax mechanism design and minimization of the burden of taxes.

Dixit, Avinash K., and Joseph E. Stiglitz. 1977. "Monopolistic Competition and Optimum Product Diversity." *American Economic Review*, 67(3): 297–308.

Under monopolistic competition with differentiated goods and increasing returns to scale in each good, is there too much or too little product differentiation? This paper uses classical tools of microeconomics to answer this question, and in doing so, provides the foundation for an entire literature in which products are endogenous in number and attributes, and general equilibrium welfare analysis can be used to examine the consequences of tastes for variety.

Friedman, Milton. 1968. "The Role of Monetary Policy." *American Economic Review*, 58(1): 1–17.

This presidential address is the origin of the "vertical long-run Phillips curve," along with a contemporary paper by Edmund S. Phelps. It introduced the idea of a "natural" rate of unemployment as the only rate compatible with the sustained coincidence of actual and expected rates of inflation. This is the basis of the conclusion that the Phillips curve is vertical in the long run, allowing only a temporary trade-off between unemployment and inflation. From this followed possible implications for

Why not refer
to both parts?

the conduct of macro-policy, especially monetary policy. An enormous amount of research and discussion followed.

Grossman, Sanford J., and Joseph E. Stiglitz. 1980. "On the Impossibility of Informationally Efficient Markets." *American Economic Review*, 70(3): 393–408.

As pointed out by a number of scholars, in a world of dispersed information, the equilibrium price will itself in general be a source of information to participants, since it incorporates whatever information other participants have. Grossman and Stiglitz examine the implication for the case where information can be acquired at a cost. If there is an equilibrium, some will choose to get informed and others not; the two courses of action must be indifferent. (Very special assumptions are made about the risk aversion characteristics of the population and about its heterogeneity.) In particular, if some individuals can acquire perfect information at a finite cost, then no equilibrium exists, since, if information is acquired by some, it will be reflected in the price and so can be acquired costlessly by others, while if no one acquires information, it will pay any individual to acquire it.

Harris, John R., and Michael P. Todaro. 1970. "Migration, Unemployment and Development: A Two-Sector Analysis." *American Economic Review*, 60(1): 126–42.

This widely cited paper starts with the puzzle that in poor developing countries one observes individuals migrating from agricultural areas to urban areas, even though they would have positive marginal product in agriculture but face a substantial probability of unemployment in the urban area. The first step in the explanation is to note that there are politically determined minimum wages in the urban areas that prevent wages from adjusting to achieve full employment for all those who come to the urban areas. The equilibrium distribution of potential workers between the rural and urban areas equates the marginal product of labor in agriculture to the expected wage in the urban area, i.e., the product of the wage and the probability of employment.

Hayek, F. A. 1945. "The Use of Knowledge in Society." *American Economic Review*, 35(4): 519–30.

The author addresses the fundamental question of the nature of the economic system and, in particular, its role in dealing with resource allocation when a fundamental knowledge base is distributed in small bits among a large population. The knowledge needed includes consumer valuations, production relations, and resource availabilities. In particular, general scientific principles, where expert opinion might be best, are only a small part of the knowledge base. The author argues for the importance of a price system in achieving coordination and efficiency in resource use without implying an impossible aggregation of information in a central place.

Jorgenson, Dale W. 1963. "Capital Theory and Investment Behavior." *American Economic Review*, 53(2): 247–59.

This paper provided a theoretical framework for investment behavior based on a neoclassical theory of optimal capital accumulation. The paper introduced the user cost of capital as the key variable that combines the cost of finance (interest rates and equity yields) and tax rules (tax rates, depreciation schedules) and combined this user cost measure with the Cobb-Douglas production technology to obtain a desired stock of capital. Jorgenson then used the resulting implied optimal capital stock to derive an econometric equation for investment. Generalizations of the Jorgenson framework (e.g., to allow for more general production functions) made this the standard approach to the empirical study of the determinants of investment. The user cost of capital also became the key concept for the theoretical study of the effects of alternative tax rules.

Krueger, Anne O. 1974. "The Political Economy of the Rent-Seeking Society." *American Economic Review*, 64(3): 291–303.

Many government policies, such as import licenses in developing nations, create rents for some market participants. While the presence of such rents and the distortions that they create have long been noted, this paper recognized the importance of "rent-seeking behavior" and explored its welfare implications. The paper's central finding is that competitive rent-seeking increases the welfare costs of policies such as trade restrictions. In the context of import restrictions, this result strengthens the case for the use of tariffs rather than import quotas, since quotas create the possibility of rent-seeking behavior. By identifying the importance of rent-seeking activities and providing a framework for analyzing their welfare costs, this paper expanded the economic analysis of the government's choice of policy instrument to achieve particular goals. It also helped to launch a voluminous literature on the role of corruption and governance in the process of economic development.

Krugman, Paul. 1980. "Scale Economies, Product Differentiation, and the Pattern of Trade." *American Economic Review*, 70(5): 950–59.

The classical theory that foreign trade is determined by comparative advantage fails to explain some important observations, for example, that there is considerable trade in both directions within what is usually regarded as a single industry, and that countries tend to export goods for which the domestic demand is higher. Krugman investigates the determination of foreign trade under increasing returns; he assumes no difference in production conditions between countries. Prices are determined by imperfect competition with costless product differentiation. Using simple models, he formalizes foreign trade. When transport costs are introduced, he shows that each country will specialize, so no two will produce the same goods. The larger country will have terms of trade turned in its favor, and wages will be higher there. Some extensions of the model allow varieties within a single industry. It can then be shown that intra-industry trade can emerge and that countries will tend to export those commodities for which the domestic demand is highest.

Kuznets, Simon. 1955. "Economic Growth and Income Inequality." *American Economic Review*, 45(1): 1–28.

Data from developing economies indicate that the earlier phases of economic development tend to be characterized by increasing income inequality, as those engaged in the small but growing modern sector of the economy pull away from those still left in agriculture and other subsistence activities. The degree of inequality reaches a peak, however, and then diminishes with further development, as the modern sector comes to dominate the economy and perhaps more so if it creates room for redistributive activity. The resulting "Kuznets curve" has been the subject of much empirical research and discussion within development economics.

Lucas, Robert E., Jr. 1973. "Some International Evidence on Output-Inflation Tradeoffs." *American Economic Review*, 63(3): 326–34.

This article introduces a tight but stylized model in which market participants must make decisions without knowing whether local changes in price signal changes in relative price or merely reflect changes in the general price level; they do, however, know the statistical properties of both processes. From this basis emerges a natural-rate model in which the ratio of real-output change to price-level change in response to exogenous shifts in aggregate expenditure depends on the relative variance of those processes. Time-series cross-section data for a number of countries provide some weak evidence consistent with the basic conclusion. The underlying assumption has gone out of favor, but the modeling technique has been very influential.

Modigliani, Franco, and Merton H. Miller. 1958. "The Cost of Capital, Corporation Finance and the Theory of Investment." *American Economic Review*, 48(3): 261–97.

A central question in corporate finance is how a firm's financial choices, such as its use of debt rather than equity financing, affect its cost of capital and consequently its investment behavior. This paper developed a new framework for addressing this question by asking how different debt-equity choices would affect the total market value of all of the cash flows that the firm provided to its investors, both bond-holders and stock-holders. The paper's central result is that, in a setting with complete capital markets and in the absence of tax-induced distortions, a firm's total market value is invariant to its borrowing behavior. This powerful result can be demonstrated constructively, by developing a straightforward set of borrowing or lending transactions that an equity investor can undertake to offset the consequences of changes in corporate borrowing. The analytical approach in this paper is one of the key foundations for the modern field of financial economics.

Mundell, Robert A. 1961. "A Theory of Optimum Currency Areas." *American Economic Review*, 51(4): 657–65.

This paper explains that selecting the optimal geographic area for a single currency involves balancing two considerations. Macroeconomic stability is enhanced if the currency area has a high degree of internal factor mobility relative to the cross-border factor mobility. Taken by itself, this could lead to an excessively large

number of currency areas, in the sense that there would be substantial transaction costs and valuation costs involved in making cross-area purchases. The optimal size of a currency area involves balancing these two considerations. Mundell discussed the potential application of this to the European countries some 30 years before the euro was introduced.

Ross, Stephen A. 1973. "The Economic Theory of Agency: The Principal's Problem." *American Economic Review*, 63(2): 134–39.

This paper was the first to describe and analyze the canonical principal-agent problem with moral hazard, which has since become a cornerstone of microeconomic theory. It solved for the optimal compensation scheme using the first-order approach, and compared the solution to the first-best arrangement, noting that the two generally diverge due to the principal's need to motivate the agent. It characterized the class of utility functions for which the principal's solution is first-best optimal regardless of the payoff structure, as well as the class of payoff structures for which the solution is first-best optimal regardless of the utility functions. In only a handful of terse pages, it anticipated many of the central issues with which the subsequent literature was concerned.

Shiller, Robert J. 1981. "Do Stock Prices Move Too Much to Be Justified by Subsequent Changes in Dividends?" *American Economic Review*, 71(3): 421–36.

Standard models of asset market equilibrium imply that the value of a share of corporate stock equals the present discounted value of that stock's expected future payouts. This paper applied an ingenious test of this present value relationship, which compared the variance of annual stock price movements with the variance in corporate dividend payouts, to the US equity market for the period 1870–1979. The results suggested that historical stock price volatility was much greater than the volatility of dividend payouts would appear to warrant. This empirical finding stimulated a wide range of follow-on research exploring various aspects of the efficient markets hypothesis, testing for time-varying discount rates in capital markets, and investigating the econometric properties of stock market returns and corporate payouts.

REFERENCES

- Alchian, Armen A., and Harold Demsetz.** 1972. "Production, Information Costs, and Economic Organization." *American Economic Review*, 62(5): 777–95.
- Arrow, Kenneth J.** 1963. "Uncertainty and the Welfare Economics of Medical Care." *American Economic Review*, 53(5): 941–73.
- Cobb, Charles W. and Paul H. Douglas.** 1928. "A Theory of Production." *American Economic Review*, 18(1): 139–65.
- Deaton, Angus S., and John Muellbauer.** 1980. "An Almost Ideal Demand System." *American Economic Review*, 70(3): 312–26.
- Diamond, Peter A.** 1965. "National Debt in a Neoclassical Growth Model." *American Economic Review*, 55(5): 1126–50.
- Diamond, Peter A., and James A. Mirrlees.** 1971. "Optimal Taxation and Public Production I: Production Efficiency." *American Economic Review*, 61(1): 8–27.

- Diamond, Peter A., and James A. Mirrlees.** 1971. "Optimal Taxation and Public Production II: Tax Rules." *American Economic Review*, 61(3): 261–78.
- Dixit, Avinash K., and Joseph E. Stiglitz.** 1977. "Monopolistic Competition and Optimum Product Diversity." *American Economic Review*, 67(3): 297–308.
- Friedman, Milton.** 1968. "The Role of Monetary Policy." *American Economic Review*, 58(1): 1–17.
- Grossman, Sanford J., and Joseph E. Stiglitz.** 1980. "On the Impossibility of Informationally Efficient Markets." *American Economic Review*, 70(3): 393–408.
- Harris, John R., and Michael P. Todaro.** 1970. "Migration, Unemployment and Development: A Two-Sector Analysis." *American Economic Review*, 60(1): 126–42.
- Hayek, F. A.** 1945. "The Use of Knowledge in Society." *American Economic Review*, 35(4): 519–30.
- Jorgenson, Dale W.** 1963. "Capital Theory and Investment Behavior." *American Economic Review*, 53(2): 247–59.
- Krueger, Anne O.** 1974. "The Political Economy of the Rent-Seeking Society." *American Economic Review*, 64(3): 291–303.
- Krugman, Paul.** 1980. "Scale Economies, Product Differentiation, and the Pattern of Trade." *American Economic Review*, 70(5): 950–59.
- Kuznets, Simon.** 1955. "Economic Growth and Income Inequality." *American Economic Review*, 45(1): 1–28.
- Lucas, Robert E., Jr.** 1973. "Some International Evidence on Output-Inflation Tradeoffs." *American Economic Review*, 63(3): 326–34.
- Modigliani, Franco, and Merton H. Miller.** 1958. "The Cost of Capital, Corporation Finance and the Theory of Investment." *American Economic Review*, 48(3): 261–97.
- Mundell, Robert A.** 1961. "A Theory of Optimum Currency Areas." *American Economic Review*, 51(4): 657–65.
- Ross, Stephen A.** 1973. "The Economic Theory of Agency: The Principal's Problem." *American Economic Review*, 63(2): 134–39.
- Shiller, Robert J.** 1981. "Do Stock Prices Move Too Much to Be Justified by Subsequent Changes in Dividends?" *American Economic Review*, 71(3): 421–36.