

## Review Essay

# The politics, mathematics and morality of economics: a review essay on Robert Nelson's *Economics as Religion*

**Cristobal Young**

*Department of Sociology, Princeton University*

*Correspondence: cristo@Princeton.edu*

Is economics a science or a theology? Nelson sensibly argues that economists are a priestly class; they issue authoritative (scientific) blessings upon the marketplace. The bishops of this class are the mathematicians, who convert ideology into "science". This essay, in contrast, argues that mathematics has more to do with internal competition between economists than with politics or religion. Indeed, in the early years, mathematical economics was dominated by socialist advocates of central planning. Over time, the mathematical school evolved towards a milder critique, emphasizing the weakness of "free market" assumptions. With an ironic twist, mathematical economics ultimately came to be interpreted as a defense of *laissez faire*. In short, mathematics traversed the whole political spectrum from socialism, to social democracy, to capitalism. While modern-day economists do often seem like free market evangelists, the role of mathematics in this is poorly understood.

**Keywords:** Mathematical economics; religion; socialism; central planning; laissez faire; sociology of economics

**JEL classification:** A110, B210, N010, B240, Z120

### 1. Introduction

In the *Encyclopedia of the World's Religions* there is, apparently, a chapter on Marxism. The core message of Robert Nelson's book, *Economics as Religion* (2001), is that there should also be a chapter on neo-classical economics. The speciality of economics, Nelson argues, is to provide a value foundation for society. 'Beneath the surface of their formal economic theorizing, economists are engaged in an act of delivering religious messages' (Nelson 2001, p. xx)—they issue a 'market sustaining

set of norms' (*ibid.*, p. 9). Economics offers morality, conviction, and ideology in the 'voice of science' (*ibid.*, p. 64).

Nelson's work challenges the distinction between the 'sociology of religion' and the 'sociology of science', or for that matter, the distinction between scientific theory and theology. His stated intent is to study the theology of economics. 'Following Isaac Newton, much of the authority of traditional religion was transferred to science' (Nelson, 2001, p. 263). Social science provides much the same moralizing function as classical religions, in a more sophisticated language but with a similar talent for confusing dogma with fact.

Nelson's subtitle, *From Samuelson to Chicago and Beyond*, is a useful organizational device, and this essay will follow it. However, this should not be taken as an endorsement of the book. Despite its engaging subject matter, the text is superficial and it wallows in the author's own theological doctrine. At the same time, there is insight to be salvaged and provocative questions to be tackled. It is a story about the fundamental nature of modern economics.

## 2. Samuelson's religion

Paul Samuelson is the key figure—or villain—in Nelson's book. Samuelson was one of the most prolific writers of 20th century economics and stood at the centre of the post-war mathematical revolution. Through the 16 editions of his best-selling textbook, he introduced generations of students to the discipline. The Nobel committee, in awarding Samuelson the 1970 prize in economics, declared that he had 'more than anybody else, shown the advantages of strict formalization of economic analysis' and had 'set the style for several generations of economists' (Nobel Foundation, 2003).

Samuelson's first book, *Foundations of Economic Analysis* (1947), was his most important. The title page contains a quote that 'Mathematics is a Language', and this sets the tone of the book. The text did not offer novelty of substance, but it did furnish things known with a new technical sophistication. Although Samuelson authored the book while still at graduate school, it was in its day, the densest mathematical treatment ever written by an American economist. The book 'might as well have been written in Sanskrit for all the incomprehension with which [it was] received by the older generation of pre-war economists' (Blaug, 1999, p. 257). This ability to mystify more senior economists was a key element of Samuelson's career success, and much of the discipline has since followed in his path.

Indeed, Samuelson—and *Foundations* in particular—was a crucial breakthrough in the mathematization of the discipline. A study of the leading American economics journals found that in 1930, little more than 10% of articles used any form of mathematics. Even among theory papers—which are the most mathematically intense—only 20% involved the use of algebra (Backhouse, 1998, pp. 92–3). By 1980, a review of the journals noted that, on average, almost every second

page featured several mathematical equations (Baumol, 1985, p. 8). Economics has become a system of thought written almost entirely in algebraic form.

In searching out the political, or religious, underpinnings of technical economics, Samuelson seems the perfect creature to dissect. Indeed, Nelson definitively establishes Samuelson's leftist political leanings. Samuelson was a leading proponent of Keynesianism, proselytized at least occasionally for the social welfare state, and described his personal philosophy as 'a simple ideology that favors the underdog and . . . abhors inequality' (cited in Nelson, 2001, pp. 53–4). It is perhaps excessive to say that his work amounted to 'a poetry of large government' (Nelson, 2001, p. 91), but this points toward Samuelson's views.

The disappointment is that Nelson has little interest in the rise of mathematical economics, or the political/religious uses for which it was employed. This is a surprising disinterest, given his central contention that the mathematical apparatus of economics is only a thin guise for sweeping value judgements.

The commentary on Samuelson is little more than a sprawling book review of the first edition of his undergraduate textbook, *Economics: An Introductory Analysis* (1948). The point, it seems, is to berate Samuelson for his leftist political leanings.

Samuelson's undergraduate text is indeed worthy of discussion. Perusing this work, one is struck by its literary quality, its breadth, and its determined relevance to practical economic problems. It is almost the antithesis of Samuelson's technical work. For example, the treatment of the communist economic system begins with a detailed account of the Russian revolution and political events leading to the immediate post-war stand-off. Elsewhere we find lengthy discussions on the structure of the modern corporation, occupations and economic stratification, and the political-economic history of the American labour movement. This is characteristic of Samuelson's approach: simplified analysis built upon the relevant historical, political and empirical surroundings. In form, it is probably less technical and more interesting than any introductory text available on the market today.

By comparing Samuelson's first book, *Foundations*, with his second book, *Economics*, one is given a vivid sense of the 'rigour *versus* relevance' trade-off. The real surprise is that they were written by the same author—indeed, published only a year apart.<sup>1</sup>

Nelson's work, however, does little to show how Samuelson quietly imported his political (or 'religious') values into the discipline under the shadow of esoteric mathematics. None of Samuelson's values are hidden, disguised, or mathematized in the introductory textbook.

---

<sup>1</sup> In the introduction to *Foundations*, Samuelson comments that 'my interest in mathematics has been secondary and subsequent to my interest in economics' (1947, p. 6). After reviewing *Economics*, one is inclined to believe him.

Nelson's intuition is difficult to dispute. 'The extensive mathematical symbolism,' he argues, 'has amounted to a special way of painting an inspiring picture of economic science at work' (Nelson, 2001, p. 147). And Samuelson used such techniques to deliver a 'scientific blessing for the welfare and regulatory state' (*ibid.*, p. 263). But there is little in this book that actually supports these claims.

### 3. The economics of mathematical economics

There is, nevertheless, an interesting question raised by Nelson's work. Why was the leftist Paul Samuelson so deeply involved in the mathematization of economics—in developing a method often seen today as 'conservative'?

There is a telling anecdote about an exchange between the mathematician Euler and the philosopher Diderot (a crusader against the Church). In a public debate, Euler pounded Diderot with the perplexing statement, 'Sir,  $(a + b^n)/n = x$ , hence God exists; reply!' (quoted in Samuelson, 1952, p. 65). Euler's defeat of Diderot points to much of the appeal of mathematical formalism.

The drive behind advanced mathematical work in economics has much to do with young economists building a competitive advantage against the more senior tenured faculty. In economics, the young have the most advanced technical skills, conduct the most 'cutting edge' research, and ascend the career hierarchy most rapidly. This is something rarely appreciated outside the discipline: advanced mathematics holds the power to confuse and intimidate not only outsiders, but also more senior economists who are rarely able to stay abreast of the latest technical advancements (Johnson, 1971). Having established a career path in which mathematical talent is so rewarded, the discipline suffers from a competitive inflation of 'rigour'. And with every cohort since Samuelson, economics has moved steadily closer to the study of applied mathematics and further from the inquiry into economic life. Indeed, it is difficult to understate the importance of mathematics in the internal rivalry for publication and prestige in modern economics.

In spite of all this, there *was* a strong ideological agenda embedded in the initial mathematical project. But for this one must rewind the historical record to the beginnings of general equilibrium and welfare economics in the US. It is an odd story of political intrigue.

### 4. The mathematics of socialism

General equilibrium theory—the mathematical analysis of a market economy as a whole—has its roots in the late 19th century works of Leon Walras and Vilfredo Pareto. Walras drafted a system of equations to represent the whole economy, while Pareto provided a 'welfare criteria' to decide what would be the ideal (efficient) level of production. It was, in essence, a project of formalizing Adam Smith's 'invisible hand' and mathematically proving its efficiency. However, the project failed to attract much following and soon faded into dormancy.

It was the era of the Great Depression, ironically, that saw a tremendous revival of the General Equilibrium (GE)/Welfare economics project. In the US, a loose grouping of devout socialists were busy detailing the elegance of the market equilibrium. The leaders of the GE revival—Oskar Lange, Abba Lerner and Abram Bergson—were cutting-edge mathematical economists and true believers in Soviet-style central planning.

This ‘socialist calculation’ project was inspired by the idea of the economy as a system of supply and demand equations. Efficiency, in the GE/welfare system, holds whenever the price of a good equals its marginal cost of production ( $P = MC$ ).<sup>2</sup> This would occur in an ideal-type competitive market, but the efficiency criteria does not require a market solution. Indeed, many could imagine a central planning committee *administering* the condition that price equal marginal cost.

Pareto himself offered the initial musing on the socialist calculation project. He noted that if a government wanted to maximize the well-being of its subjects, it would set the ‘coefficients of production’ to match the conditions of a perfectly competitive market (Pareto, 1897, p. 499). The market outcome, in other words, could be centrally planned. If an economy is simply a set of supply and demand equations, all that is really needed for its optimal solution is an economist.<sup>3</sup> Thus, capitalism was left with little formal justification.

Abram Bergson—the first to seriously develop Pareto’s ‘welfare criteria’ in the US—reflected that ‘a major aspect of the development of [general equilibrium] welfare economics’ was ‘the theoretic analysis of socialist economic calculation’ (Bergson, 1966, p. vii). The career of Oskar Lange—the leading figure in the GE/welfare economics revival—drives the point home. In the 1930s, Lange gained notoriety for combining cutting-edge neo-classical theory with socialist advocacy, staging a famous (and surprisingly successful) clash with the Austrians over the possibility of central planning. In his later years in the US, he served as editor of *Econometrica*—then, as now, the most technically advanced journal in the discipline. After World War II, he returned to a communist-dominated Poland, taking on elite posts such as delegate to the UN Security Council. As a member of the Polish State Council, he advocated neo-classical pricing theory as the foundation for central planning. In 1953, he wrote an essay praising the recently deceased Joseph Stalin as an ‘economic theorist’ whose writings on the Soviet economy constituted a ‘momentous event in the history of science’ (cited in Kowalik, 1987, p. 128).

---

<sup>2</sup> The ‘price equals marginal cost’ condition was first established, using the tools of geometry, by the socialist Abba Lerner (1934).

<sup>3</sup> It remains a core theorem of mathematical economics that production functions of firms can be aggregated (i.e. centralized). This allows the economist to identify the optimal output for an economy (for a technical treatment, see Mas-Colell *et al.*, 1995, pp. 147–9). The competitive (‘free market’) output is no different than if production were centrally planned.

The pioneering generation of GE/welfare economists saw their task as writing a guidebook for the operation of a socialist economy. Yet there was another appeal of GE analysis, which explains its popularity beyond the initial circle of communist planning theorists. Once again, motivations can be traced back to Pareto. He argued that it was ‘necessary to give [the ‘invisible hand’] proposition precision, in order to see more clearly the limitations within which it holds true and what conditions it assumes as given’ (Pareto, 1897, p. 499). Formalistic precision would illuminate the weak points in free-market theory.

The GE framework, given sufficient mathematical complexity, is actually a grand narrative on the fragility and implausibility of perfect market equilibrium. Successive mathematical torturing has outlined an extensive list of unlikely conditions required to demonstrate general market efficiency. Mark Blaug has nicely summarized a partial inventory: ‘perfectly rational, omniscient, identical consumers; zero transaction costs; complete markets for all time-stated claims for all conceivable contingent events, no trading at disequilibrium prices; no radical, incalculable uncertainty . . . ; only linearly homogeneous production functions; no technical progress requiring capital investment, etc’ (Blaug, 1997, p. 5).

Market efficiency was seen as highly contingent upon the accuracy of these sorts of underlying assumptions. This is well captured in the dry conclusion of Arrow and Debreu’s famous equilibrium proof: ‘For an economic system satisfying Assumptions I-III, IV<sup>n</sup>, V and VI, there is a competitive equilibrium’ (Arrow and Debreu, 1954, p. 287). For an economic system that failed to satisfy such assumptions, there seemed a need for government intervention. General equilibrium theory provided a sort of checklist for market critics.

Oskar Lange once likened the prospects of a free market achieving efficiency to the situation of ‘an ape trying to write the Encyclopedia Britannica’ (Kowalik, 1987, p. 125). The second generation of GE/welfare theorists—led by Paul Samuelson—were more generous in their assessment of capitalism, but not enormously so. For Samuelson’s generation, GE/welfare economics was not a framework for socialist planning, but rather a sort of mathematical de-clawing of the market and its claims to perfection. This was the broader GE/welfare project that drew in a long series of gifted economists—Paul Samuelson, Nicholas Kaldor, John Hicks, Gerald Debreu, Kenneth Arrow, and so on. Compared to the pioneering group associated with Oskar Lange, these were moderate reformers. They were, nonetheless, a group that held little appreciation for free-market theory, and their mathematics elegantly demonstrated the fact.

## 5. ‘God bless the market’

The Chicago school of economics, under the gifted and dogmatic leadership of Milton Friedman and George Stigler, took up the task of rescuing the market from the unflattering conclusions emerging in GE analysis.

None of the Chicago school participated in the development of the GE/welfare school of thought, or its mathematical formalism. Indeed, one of the hallmarks of the Chicago school is its relatively simple and informal analytical tools.<sup>4</sup> Chicago has generally taken the view that ‘good theory’ should be comprehensible to non-specialists.

The Chicago hostility to the GE project is well summarized by Stigler. Finding ‘the conditions necessary to make [market efficiency] rigorously true,’ Stigler wrote, is in essence a ‘search for flaws in the doctrine’. Indeed, ‘the complex theory of welfare economics’ was better described as ‘the economic analysis of market failure’ and the project was ‘infertile and obfuscatory’ (Stigler, 1975, pp. 103–4). Nevertheless, it was rare to find Chicago economists directly attacking GE/welfare economics. Rather, their approach was sideways, ingenious and effective.

Their principle device was the ‘as if’ assumption. Milton Friedman, torchbearer for the ‘free market’, insisted that the realism of background assumptions is not important. ‘In general, the more significant the theory, the more unrealistic the assumptions’. Good theory may well make use of ‘wildly inaccurate’ assumptions, and proceed ‘as if’ the assumptions held true (Friedman, 1953, p. 14). The purpose of theory is to generate testable implications. Economics seeks ‘to construct an “engine” to analyze [the economy], not a photographic reproduction of it’ (*ibid.*, p. 35).

On these grounds, Friedman rejected the complaint that ‘the assumptions of “perfect competition” . . . are a false image of reality’ (Friedman, 1953, p. 15). Confidence in capitalism, Friedman pointedly wrote, does not depend on the mathematical requirement for ‘markets to be perfect, competition to be pure, and commodities, labor, and capital to be homogeneous’ (*ibid.*, p. 31). The ‘as if’ qualifier was the ultimate assumption—assumptions could be assumed to hold true.<sup>5</sup>

This methodological—or, perhaps, religious—outlook was supported by unrelenting attacks on virtually any viewpoint skeptical of free-market idealism. Parallel to this ran an analysis of ‘government failure’—a demonstration of the inefficiency of government and its susceptibility to ‘capture’ by powerful interests (Stigler, 1975). Pressing further, Friedman widely popularized the ‘road to serfdom’ hypothesis—that government represented a dangerous intrusion into individual liberty (Friedman and Friedman, 1981). Even if the market was an imperfect creature, the imperfections of government were a far greater threat.

<sup>4</sup> Of course, rational choice theory reigned supreme in the Chicago world, but the seminal Chicago economists forged their analysis out of straightforward arguments that any intelligent audience could understand (if not accept). Much of this analytical simplicity has been lost. Wandering the halls of Chicago economics today, one would no longer find an oasis of informal argumentation. This reflects Samuelson’s influence upon the discipline—the entrenchment of a career track in which mathematics is enormously rewarded.

<sup>5</sup> Friedman failed to insist, as Blaug noted, that assumptions should be possible to relax ‘without doing fatal damage’ to the whole theory (Blaug, 1997, p. 5).

In the end, the project initiated by socialist economists never survived the Chicago response. The GE/welfare programme is today widely seen as demonstrating ('proving') the efficiency of free-market capitalism. There still remains the extensive list of implausible requirements for market efficiency, it is just that an 'as if' world need not worry about such qualifiers. The mathematical proofs of market efficiency are now regarded as making claims to truth, rather than highlighting the tenuous and implausible nature of the idea. The new context put in place by the Chicago School largely transformed the meaning of the early mathematical economics.

But all of this wanders quite a distance away from Nelson's text. Despite the many condemnations of Samuelson and his mathematical formalism, Nelson offers no understanding as to why the leftist Samuelson embraced mathematics or why his conservative Chicago critics rejected such techniques. The intrigue surrounding mathematical economics—its reformation from central planning, to more moderate government intervention, to free-market liberalism—goes largely unnoticed in Nelson's book.

## 6. Chicago versus The 10 Commandments

Nelson is in his best form when he takes up the 'other side' of Chicago economics. Chicago is rightly interpreted as having two distinct branches: one that fiercely defended *laissez faire* capitalism, and another that pressed the neo-classical framework deep into the traditional territory of sociology, political science and law.

This 'other side' of Chicago economics is represented by Gary Becker and Richard Posner. New subjects taken on by Becker and Posner include crime, capital punishment, euthanasia, divorce, prostitution, polygamy and promise-keeping. By inserting the word 'efficient' before each of these subjects, we are informed that economic science can solve most—if not yet all—of the social and ethical problems of humanity. Their conclusions, as Nelson observes, usually contradict God's Commandments as they were reported by Moses.

The Becker–Posner tack has been to interpret all of social life as business exchange. Some of this is amusingly subversive. In the world of consensual sexual relations, one finds two basic models. There is the long-term contract for the exchange of services (sometimes referred to as 'marriage'), and there is the less-involving 'spot market.' In the latter market structure, the demand side often turns to prostitutes 'in order to minimize search costs.' Prostitution is, in the end, an optimal arrangement for a society that has a 'surplus of bachelors' (Nelson, 2001, pp. 180–1).

The 'efficient rape' hypothesis puts a distinctly darker tone on the logic. Rape is in a sense a redistribution of utility from the victim to the offender. It is not

fundamentally different from a government programme for the redistribution of income. Under the 'Potential Pareto' criteria, rape is efficient if the utility gain of the offender is greater than the losses suffered by the victim. It follows that the criminal justice system should not set the 'price' (punishment) of rape 'too high'.

The only form of rape that is deplorable, in this view, is that which is inefficient (generates a net loss of utility). People with oddly-shaped preference functions should be allowed to rape others, provided that they would be willing to pay the efficient price. The traditional error of the criminal justice system is that it fails to consider the utility of the offender.

It is seriously doubtful if Becker or Posner actually believe rape is ever 'efficient'. The point is that it can be *in principle*. Indeed, the Becker–Posner branch of Chicago seems to take enjoyment in attacking 'the traditional moral outlooks of ordinary Americans' (Nelson, 2001, p. 167). And by expanding the boundaries of conventional economic logic, Becker and Posner have done more than any critic to point out the profound value judgements that are so often embedded in economic analysis.

## 7. Economists as (efficient) priests

It is hard, in the end, to sort out Nelson's concluding arguments. But it is clear that the Becker–Posner approach has strayed from the path of God. At the same time, the Chicago economics department is the site of God's latest revelations, and Friedman and Stigler are His prophets.

The real value of economics lies in defending the glory of the market, and this task 'did not require any great scientific apparatus' (Nelson, 2001, p. 330). Indeed, 'any old religion may do for economic purposes as long as it is truly believed in and supports the market'. The validity of economic arguments is not of central importance. What is needed is a 'class of priestly deliverers of authoritative blessings' (*ibid.*, pp. 301–2). The irony is that in the modern, rationalized world, authoritative blessings need a veil of scientific prestige. Thus economists need to make truth claims about the superiority of market, although it does not matter if these specific claims are precisely true.

In the chapter, 'God Bless the Market,' Nelson presents his view that God has, in fact, blessed the market. Indeed, Nelson goes so far as to critique the Pope for not being sufficiently informed by neo-classical theory (Nelson, 2001, p. 322).

The market, in Nelson's view, needs an 'implicit contract' to the effect that 'each person accepts as socially legitimate the verdict of the market, even when this verdict in particular circumstances may turn out quite negative for some of the individuals' (Nelson, 2001, p. 261). Thus, economic progress is likely to 'require proselytizing and religious conversion . . . as much as increased investment' (*ibid.*, p. 263). Economics *is* a religion, Nelson concludes, and this is its chief virtue.

## 8. Conclusion

One of the pleasures of reading Nelson's work is discovering its unlikely combination of arguments. Rarely are the politically charged so willing to relinquish their claim to scientific superiority.

In places, Nelson can be said to extend a sort of Weberian approach—understanding social behaviour in terms of religious foundations—into the sociology of science. For example, Nelson argues that a 'Calvinist economics'—with its rejection of this-world pleasures—would lead to 'almost a complete inversion of the foundational assumptions of economics' (Nelson, 2001, p. 133).

Yet such insights amount to no more than the occasional, passing remark. The focus of the book is elsewhere. Nelson, although deeply religious himself, mainly uses religion as slander. One can tell how 'progressive' an idea is by the frequency and intensity with which the author draws religious parallels. A fan of the Friedman–Stigler team, Nelson almost entirely drops the language and metaphors of religion when describing their work. A serious history of religion would not conclude that the Protestant Reformation achieved a better understanding of God's will. But this is the sort of history Nelson is writing. Milton Friedman, we learn, was really a progressive in the tradition of Paul Samuelson. 'But [Friedman] had a deeper insight into the policy actions necessary to realize these values' (Nelson, 2001, p. 141).

These sorts of passages make the book read more like a Republican Party newsletter than a serious academic work. Indeed, Nelson's footnotes are frequently reserved for approving quotes from Christian theocratic magazines and dogmatic US Republicans such as Pat Buchanan. The book concludes with a two-page quote from Republican Senator John McCain on the theme of American glory.

Nevertheless, the book clearly has merits. One of its strengths is that Nelson shines attention on the two central figures that have shaped post-war economics: Milton Friedman, for his political leadership, and Paul Samuelson, for his innovations in mathematical formalism. Sociological discussions of economics have generally neglected both writers.<sup>6</sup>

There is an intriguing point to be drawn from the focus on Friedman and Samuelson. The tremendous influence of these two might have run in a completely opposite direction, had different aspects of their 'religions' been embraced. Samuelson was a left-wing mathematician extraordinaire; Friedman was a sharp conservative with little interest in the rigorous abstractions of formal theory. The profession, it seems, has salvaged what it wanted from each author. Thus a conservative, formalistic discipline was founded in a place where political and methodological pluralism had previously reigned.

---

<sup>6</sup> The Becker/Posner branch—the intrusions of economics into sociology—has received much more attention in sociology. However, this is still a bit of a sideshow in economics, acknowledged by the mainstream but distant from the work of most authors.

## Acknowledgements

The author would like to thank Patricia Young, Malcolm Rutherford, Ken Avio, an anonymous reviewer and a co-editor of the *Socio-Economic Review* for helpful comments and criticisms.

## References

- Arrow, K. J. and Debreu, G. (1954) "Existence of an Equilibrium for a Competitive Economy" *Econometrica*, **22**(3), 265–290.
- Backhouse, R. E. (1998) 'The Transformation of US Economics, 1920–1960, Viewed through a Survey of Journal Articles'. In Morgan, M. S. and Rutherford, M. (eds) *From Interwar Pluralism to Postwar Neoclassicism. Annual Supplement to Volume 30. History of Political Economy*, Durham, Duke University Press, pp. 85–107.
- Baumol, W. J. (1985) 'On Method in US Economics a Century Earlier', *American Economic Review*, **75**, 1–12.
- Bergson, Abram. (1966) *Essays in Normative Economics*. Cambridge, Belknap Press of Harvard University Press.
- Blaug, M. (1997) 'Ugly Currents in Modern Economics', *Policy Options*, **18**, 3–8.
- Blaug, M. (1999) 'The Formalist Revolution or What Happened to Orthodox Economics After World War II?' In Backhouse, R. and Creedy, J. (eds) *From Classical Economics to the Theory of the Firm*, Northampton, Edward Elgar, pp. 257–280.
- Friedman, M. (1953) *Essays in Positive Economics*, Chicago, University of Chicago Press.
- Friedman, M. and Friedman, R. (1981) *Free to Choose: A Personal Statement*, New York, Avon.
- Johnson, H. G. (1971) 'The Keynesian Revolution and the Monetarist Counter-Revolution', *American Economic Review*, **61**, 1–14.
- Kowalik, T. (1987) 'Lange, Oskar Ryszard'. In Eatwell, J., Milgate, M. and Newman, P. (eds) *The New Palgrave: a Dictionary of Economics*, New York, Stockton Press, pp. 123–9.
- Lerner, A. (1934) 'The Concept of Monopoly and the Measurement of Monopoly Power', *Review of Economic Studies*, **1**, 157–75.
- Mas-Colell, A., Whinston, M. D. and Green, J. R. (1995) *Microeconomic Theory*, New York, Oxford University Press.
- Nelson, R. H. (2001) *Economics as Religion: From Samuelson to Chicago and Beyond*, University Park, Pennsylvania State University Press.
- Nobel Foundation (2003) The Bank of Sweden Prize in Economic Sciences in Memory of Alfred Nobel 1970. Presentation Speech by Professor Assar Lindbeck, Stockholm School of Economics. Available at [www.nobel.se/economics/laureates/1970/press.html](http://www.nobel.se/economics/laureates/1970/press.html) (accessed September 2003).
- Pareto, Vilfredo. (1897) "The New Theories of Economics." *The Journal of Political Economy*, **5**(4), 485–502.

Samuelson, P. A. (1947) *Foundations of Economic Analysis*, Cambridge, Harvard University Press.

Samuelson, P. A. (1948) *Economics: An Introductory Analysis*, 1st edn, New York, McGraw-Hill Book Company.

Stigler, G. J. (1975) *The Citizen and the State: Essays on Regulation*, Chicago, University of Chicago Press.