



## **James A. Mirrlees and William Vickrey The Nobel Laureates and Their Contributions to Public Economics**

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The Nobel Prize in Economics in 1996 was awarded to Professor James A. Mirrlees of the University of Cambridge and to Professor William Vickrey of Columbia University. Mirrlees and Vickrey were cited by the Nobel committee for their contributions to the economic analysis of informational asymmetries. The work of both of these Nobel laureates is of special interest to *International Tax and Public Finance* because of its importance for public economics. We are therefore publishing a collection of papers which review and assess the impact of Mirrlees and Vickrey on public economics and the lessons and insights that their work provides for future research in this field.

The following symposium includes two articles on the work of James Mirrlees. In the first, Robin Boadway examines Mirrlees' theoretical contributions to public economics. While Mirrlees has written a number of articles on problems in this field, his two 1971 articles on optimal taxation may be the ones that come immediately to mind for many. One of these, a two-part article written jointly with Peter Diamond (Diamond and Mirrlees, 1971), has stimulated a tremendous revival of interest in a problem first examined by Ramsey in the 1920s: how to structure a system of (linear) taxes so as to raise revenue in a welfare-maximizing fashion. Samuelson, Boiteux, and others had previously examined this problem (or variants of it), but Diamond and Mirrlees advance the discussion in a number of respects. For instance, they show explicitly how to integrate both efficiency and equity considerations in the formulation of an optimal tax structure; they break significant new ground in addressing the problem of optimal public production in a tax-distorted second-best environment; their analysis is executed within a general-equilibrium framework that traces directly to the standard Arrow-Debreu model of general equilibrium and that inherits the enormous generality of that model; and they draw specific attention to several technical problems of general-equilibrium welfare analysis which necessitate careful attention in any attempt to draw concrete policy conclusions from the analysis. Each of these aspects of the Diamond-Mirrlees paper has given rise to further analysis in the literature, and one might well conclude, in the words of Robin Boadway, that this paper is "fundamental for having laid the foundations to the 'optimal tax revolution'" in public economics. In Boadway's view, however, it is Mirrlees' *other* famous 1971 paper, on the theory of optimal income taxation, which constitutes the more seminal contribution.<sup>1</sup>

Boadway argues that Mirrlees' optimal income tax analysis, in identifying limited in-

formation as the truly fundamental constraint on public policy, has stimulated a major rethinking of public economics. Mirrlees focused on one specific aspect of informational constraints, namely, the government's inability to know exactly how productive a taxpayer could potentially be, and the necessity of gauging productivity from observed income rather than from unobservable talent or ability. His article makes clear that it is this informational constraint that prevents the government from using ideal lump-sum taxes. Without these constraints, the optimal utilitarian tax policy would result in perfect equality of incomes for all people, as the utilitarians of the late nineteenth century understood. But this perfect equality would mean, in practice, that the incentives to earn income would be destroyed. Mirrlees' analysis of optimal income tax policy maintains the social objective of utilitarianism, but takes the incentive effects of income taxation explicitly into account, with profound effects on the determination of optimal income tax policy. As Boadway's contribution to this symposium shows, the implications of the Mirrlees analysis go well beyond the optimal income tax problem itself. What he characterizes as the "Mirrlees approach" to policy evaluation is equally relevant to our understanding of numerous other branches of policy analysis, including public expenditure evaluation, the formulation of both tax and expenditure policy over time (the time-consistency problem), intergovernmental fiscal relations, and environmental policy, to name a few. In Boadway's view, and evidently in the view of the Nobel committee as well, it is Mirrlees' recognition of the incentive problems arising from informational constraints that has had, and will continue to have, the most far-reaching consequences for public economics.

Another aspect of Mirrlees' work that is important for public economists deals with project evaluation and benefit-cost analysis. In the 1970s, in collaboration with I.M.D. Little, Mirrlees prepared a manual for project appraisal in developing countries and published a well-known book on this subject. The analytical foundations of this work derive from the same tradition of neoclassical welfare economics that underlies his research on optimal taxation, but the emphasis here is decidedly practical (if no less concerned, in a different way, with informational problems in public policy evaluation). Governments in developing (and developed) countries continually make decisions that directly or indirectly affect the level of production, investment, and employment in diverse industries. Broadly speaking, the objective of benefit-cost analysis is to help governments make better rather than worse decisions. The Little-Mirrlees project appraisal methodology is a framework for systematic evaluation of the allocative and distributional effects of public-sector "projects," which can range from investments in public infrastructure such as hydroelectric dams or highways to investments in industries that produce goods and services normally considered to be "private," such as chemicals or paper.<sup>2</sup> Indeed, abstractly speaking, a "project" can be construed much more broadly still to refer to any public-sector action that perturbs the allocation of resources in the economy, i.e., virtually any public policy at all (see, e.g., Drèze and Stern, 1987). But benefit-cost analysis is not, or not only, about abstractions, it is about real decisionmaking in practical situations. What has been the impact of the Little-Mirrlees methodology in practice?

Lyn Squire has seen project appraisal in operation at the World Bank. He has himself worked to promote a better appreciation of benefit-cost methodology and toward its practical implementation (see, e.g., Squire and van der Tak, 1975). In his essay, Squire reviews the

World Bank's experience with project appraisal. Have managers of projects there utilized these methods? If so, have they applied them well? Perhaps discouragingly, the answer seems to be generally in the negative. Many projects go forward with little if any formal evaluation of a kind that would bear a recognizable resemblance to the Little-Mirrlees (or any other) benefit-cost methodology. Squire examines the reasons why this might be the case. One possibility, he finds, is that part of the "bite" of the Little-Mirrlees project evaluation procedures comes from its insistence that traded goods and services be valued at their prices on international markets rather than at domestic prices which could reflect any number of tariff and other distortions. At the time that Little and Mirrlees wrote, these distortions were more severe than they are at present. The gradual liberalization of trade in developing countries implies that domestic prices are now more closely aligned with world prices. Thus, the need to develop special accounting prices with which to value public projects is diminished. Squire identifies other important changes in the environment of public sector decisionmaking in addition to trade liberalization. His discussion suggests that the role of benefit-cost analysis—and, by extension, all economic policy analysis—may inevitably be somewhat contextual. As the world changes, perhaps the emphasis and role of benefit-cost analysis must also change. Perhaps the principles of benefit-cost analysis themselves tell us that this must be so.

Richard Arnott contributes an essay to this symposium that examines the work of William Vickrey. Vickrey had a long career in economics, culminating, just days before his death, with the award of the Nobel prize. Like Mirrlees, Vickrey made important contributions to many branches of economics. The Nobel citation, of course, emphasizes his work on information, work which has had ramifications throughout economic theory but which, in particular, has significantly influenced public economic theorists such as Groves and Ledyard (1977), Green and Laffont (1979), and many others who later grappled with the problem of preference revelation for public goods. As significant as Vickrey's impact on this line of inquiry has been, however, his influence on public economics extends well beyond pure public expenditure theory. Indeed, from the very earliest stages of his career, Vickrey displayed a keen interest in public policy analysis, and particularly in the analysis of fiscal policy. This interest—and the distinctive blend of abstraction and practicality that characterizes much of his research—is evidenced by his 1939 article on income averaging for tax purposes or his book, *Agenda for Progressive Taxation*. But Vickrey's highly creative approach to the economics of public policy was hardly confined to tax analysis alone. As Richard Arnott's essay shows, Vickrey made great contributions as well to the analysis of public expenditure policy, and not just to public expenditure analysis in general but to issues as broad as the problem of using public expenditures to achieve a just distribution of income in society and to issues as practical and specific as financing investments in urban subway systems. Indeed, he wrote on the development of pricing schemes for public transportation and highways, blending principles of public expenditure theory, tax theory, efficient pricing, and distributional equity to deal with very concrete, real-world problems of public policy.

In his evaluation of Vickrey's work, Richard Arnott discusses not only Vickrey's contributions to public finance, narrowly construed, but his contributions to economic policy generally. He notes not only the remarkable originality of Vickrey's thought, but his idiosyncracies of analytical approach and expository style, suggesting that his economic

reasoning was “model-assisted rather than model-based.” In Vickrey’s thinking, perhaps, the problems of economic policy and the problems of economic theory need not, or should not, or maybe even could not really be separated. To understand real economic problems, it would seem, we use economic theory, or, if appropriate, recast economic theory, or, if need be, invent new economic theory; theory does not exist for its own sake, but is the means by which we grapple with the problems that really define our subject. His unusual blend of theoretical and applied interests may help to explain the amazing range of Vickrey’s writings, published in an incredibly diverse variety of outlets. Vickrey was certainly remarkable in his ability to apply economic analysis to practical problems of public policy. In this, he sets a worthy example for the next (and every) generation of public economists.

It is not every year that Nobel prizes in economics are awarded to scholars who have had as much impact on public economics as James Mirrlees and William Vickrey. *International Tax and Public Finance* is pleased to present this symposium and hopes that it will serve not only as a fitting tribute to the contributions of James Mirrlees and William Vickrey but that it will also stimulate reflection on the recent development of our field and its future direction.

## Notes

1. The two 1971 articles just mentioned are not the only famous papers published by Mirrlees in the early 1970s. Another, on the welfare economics of urban spatial structure (Mirrlees, 1972), is equally renowned in its field and appeared almost at the same time as the optimal tax papers. The 1971 optimal income tax paper was pioneering in its use of control-theoretic techniques to derive non-linear functional solutions— income tax schedules, in this case—to a welfare maximization problem. The 1972 urban paper was also pioneering in its use of control-theoretic techniques to derive non-linear functional solutions—in this case, functions describing the distributions of population, consumption patterns, and utility over space—to a welfare maximization problem.
2. Such examples are discussed in another well-known book on project appraisal that dates to approximately the same period as the Little-Mirrlees work, that by Dasgupta, Marglin, and Sen (1972).

## References

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James A. Mirrlees, a British economist who won the Nobel Prize for his theories of economic incentives, which have been applied to taxation, insurance and the allocation of public services, died Aug. 29 at his home near Cambridge, England. He was 82. Dr. Mirrlees, who shared the 1996 Nobel Prize with William Vickrey of Columbia University, approached economics from a background in mathematics. He was particularly fascinated by ideas first put forth by Vickrey and others concerning "information asymmetry," in which one party in an economic transaction is privy to knowledge the other does not have. "That just means not knowing as much as you would like," Dr. Mirrlees explained. James A. Mirrlees at Cambridge University in England in 1996 after he was awarded a share of the Nobel economics prize. He was a professor there. Credit: Findlay Kember/Associated Press. Professor Vickrey was an American eccentric; his Columbia University colleagues described him as so idiosyncratic and uninterested in material comforts that he barely knew how much he was paid. Professor Mirrlees was a reserved, conventional British academic who enjoyed detective stories and playing the piano. Neither was expecting to be awarded the prize. Professor Vickrey, a pioneer in developing what became known as congestion pricing (to reduce traffic, for example), died of a heart attack at 82 three days after the Nobel was announced. The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 1996 was awarded jointly to James A. Mirrlees and William Vickrey "for their fundamental contributions to the economic theory of incentives under asymmetric information". James A. Mirrlees. Facts. Photo from the Nobel Foundation archive. James A. Mirrlees The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 1996. Born: 5 July 1936, Minnigaff, Scotland. Died: 29 August 2018, Cambridge, United Kingdom. Affiliation at the time of the award: University of Cambridge, Cambridge, United Kingdom. Prize motivation: "for their fundamental contributions to the economic theory of incentives under asymmetric information." Sir James A. Mirrlees. Nobel 1996 | How can we create a fair tax system? A mathematical prodigy, James Mirrlees spent most of his rural Scottish childhood in solitude, solving the tricky problems he found in a never-ending pile of books. Field: Information economics. Prize-winning work: Economic incentives in situations with incomplete or asymmetrical information; specialized in optimal taxation. Missed opportunities: He never met his co-laureate William Vickrey, who died a few days after the announcement of the 1996 Nobel prize. Hong Kong's best: He found the only place in Hong Kong where you can get German-style bread (but we forgot to ask for the address). A small honorarium was provided to speaker(s) to cover their time and expenses.