A Citation for Professor Sir James Mirrlees

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Market transactions are based on information about prices. Recent advances in economic theory have explored the implications of informational asymmetries, situations where information is not equally available to all agents. Such situations are common in the real world. For instance, an insurance company knows less than the policyholder about the true risks faced; a borrower knows more than a lender about the probability of repayment; a government cannot directly observe the true incomes of its taxpayers. Informational asymmetries can clearly give an advantage to one party over another. Resources are spent in an attempt to overcome these difficulties. Decision-making based on imperfect knowledge is far from trivial. Strategies may be devised to influence prices. Once informational asymmetries are recognized, the paradigm of the perfectly competitive and fully efficient economy breaks down.

Professor James Mirrlees is a pioneer of the economics of imperfect information. His work has laid the methodological foundation of the modern approach to decision-making under imperfect and asymmetric information. His work, the work of his co-authors -- notably Peter Diamond of MIT -- as well as the work of the scores of talented economists he has inspired, all of these endeavours have helped improve our understanding of the trade-offs faced by homo economicus in a wide range of situations: in understanding credit markets, private insurance markets, social insurance, the internal organization of firms, tax systems, the optimal design of institutions, and many other issues.

James Mirrlees was born in 1936, in Scotland, in the village of Minnigaff. He graduated in Mathematics from the University of Edinburgh (1957), then went to Cambridge to read Mathematics, and in 1959 switched to Economics. His PhD thesis, entitled "Capital Accumulation Under Uncertainty", with special concern on technical progress, indicated his first significant contribution to economics, was the prelude to a life devoted to economic research.

His first appointment as assistant lecturer was in association with Trinity College in 1963. Five years later, he was appointed the Edgeworth Professor of Economics, at Oxford, where he remained until 1995, when he returned to Cambridge as Professor of Political Economy.

In Oxford, Professor Mirrlees worked on the theory of planning, economic development, and public finance. In collaboration with Ian Little he wrote his first

book on cost-benefit analysis for developing nations. In collaboration with Peter Diamond he wrote several articles on the theory of optimal taxation. "An Exploration in the Theory of Optimal Income Taxation", published in 1971, made an immediate and lasting impact on the profession.

In Cambridge, Professor Mirrlees returned to Trinity College. In 1996 he was awarded the Nobel Prize in Economics for his fundamental contribution to the economic theory of incentives under asymmetric information (the prize was shared with William Vickrey). Professor James Mirrlees was knighted in 1998.

He is a Fellow of the Econometric Society (of which he was the President in 1983) and of the British Academy, and a foreign member of the US National Academy of Sciences. Sir James Mirrlees held visiting professorships at the Massachusetts Institute of Technology (1968, 1970, 1971, 1976), University of California at Berkeley (1986), and Yale University (1989). His professional connections with China began in 1997. Sir James Mirrlees is Honorary Professor at Peking University and Xi'an University. Since 2002, he has been Distinguished Professor-at-Large at the Chinese University of Hong Kong.

The design of optimal income taxation in the presence of information asymmetries is regarded as the foremost achievement of Sir James Mirrlees. Before Mirrlees, as it were, various principles of justice had governed the structure of taxation. Based on a utilitarian perspective, Francis Y. Edgeworth (1897) argued that incomes should be equalised by lump-sum transfers. However, the information that the policymaker would need to implement an optimal system of lump sum transfers are clearly beyond the reach of the tax administrator. An income tax distorts incentives (in particular the incentive to work) and creates efficiency losses in the economy. As such, the design of an income tax involves a tradeoff between equality and efficiency. William Vickrey reformulated the issue as an incentive problem under asymmetric information, but stopped short of providing the complete and usable framework that would make Mirrlees' 1971 article so novel and influential. One significant breakthrough was to impose an empirically reasonable restriction on the utility function, which guarantees a solution to the optimization problem, the now famous "single-crossing condition".

The Mirrlees optimal income tax schedule can be seen as the solution to a problem of optimal design of incentives under asymmetric information. In the model a redistributive tax has to be levied on income, with the result that it distorts the labor-leisure decisions. The question Mirrlees asked is the following: "What are the properties of the optimal income tax function? Of particular interest is the question of how the marginal tax rate varies with income." At the very top of the income distribution, distorting this one person's choice of effort effects no redistribution, while it does imply an efficiency loss. Hence the top marginal rate should be zero. It

should be stressed that this is a result about limits, and that it does not necessarily support the view that the rate applicable to, say, the upper percentile of income earners should be zero.

His analysis further extended to the theoretical and practical generality of the so-called "revelation principle", according to which the solution to incentive problems under incomplete information belongs to a relatively limited class of allocation mechanisms—those which coax all individuals to reveal their private information in accordance with their true preference without violating their self interest. By applying this principle, it becomes much easier to design optimal contracts. Nowadays, this principle is the standard method for designing optimal allocation mechanisms under information asymmetries.

Another important outgrowth of Sir James Mirrlees's work on taxation is on the design of two-party negotiations, for instance in the context of insurance, in the presence of "moral hazard"—that is, whenever one party (say. the insurer) is at the practical mercy of the other party's honesty (here the insured). It was Sir James Mirrless in the mid-1970s who formally couched the "game" being played under these conditions as bilateral attempts to accommodate "probability information" into mutually acceptable terms such as the availability of the policy or the value of the premium, as well as the nature of clauses that modify or restrict coverage. The two parties to the contract are, in essence, tailor making a field-leveling incentive scheme. And the sellers must keep their contractual counter-balances reasonable. for fear of losing the business to a competing insurer, as buyers of insurance are. no doubt, conducting similar negotiations with other insurers.

Together with Peter Diamond, Sir James Mirrlees investigated the consumption tax in a second-best world where "tax wedges" give rise to social inefficiency. They showed that, under relatively general conditions, it is desirable to maintain production efficiency. This means that taxes should not be imposed on factor inputs. This result has had widespread influences for project appraisal and economic policy in developing countries. In subsequent developments of this work, Sir James Mirrlees has set up criteria for evaluating projects based on the desirability of efficiency in production.

Sir James Mirrlees' fundamental achievements in the theory of incentive demonstrate his far-reaching contributions to economic science. Methodologically, his work has become a paradigm in the economics of asymmetric information, inspiring many new successors and paving the way for further refinements of the economics of information and incentive, as exemplified by the work of his contemporaries and Nobel Laureates George Akerlof, Michael Spence, and Joseph Stiglitz.

Your Excellency, Chancellor, I thus have the privilege to present Professor Sir

James Mirrlees, Nobel Laureate in Economics, for the award of the degree of Doctor of Social Sciences, *honoris causa*.