The Economic Analysis of Technology Policy by Paul Stoneman (Oxford University Press, Oxford, 1987) pp. x + 224, ISBN 0-19-877260-2

This is Paul Stoneman's second book in the area of the economic analysis of technical change. While the first book used positive analysis, this one is concerned with technology policy, broadly defined as "policies involving government intervention in the economy with the *intent* of affecting the process of technological innovation" (p. 36). As in the previous book, Stoneman brings into this one too his extensive knowledge of the economic theory that is related to this area, derived from his many years of research experience that have led to numerous contributions, and, more importantly, his substantial ability to relate this theory to real world issues and derive policy prescriptions. The discussion of the latter is the unique contribution of the present volume and I found reading it extremely interesting. The area of policy related to the diffusion of new technologies, the area of most research interest to Stoneman in recent years, is particularly enlightening.

The book begins with five short introductory chapters (making up Part I) that discuss the basic concepts and the background welfare theory required for an understanding of the rest of the volume, review the different ways in which governments in different countries have intervened in the process of technical change, and review the literature (old and new) that establishes that innovativeness is fundamental to good economic performance. This part is enriched with quite a bit of useful statistical information.

Parts II and III form the core of the book. Part II (chapters 6-8) discusses diffusion, with an attempt, towards the end, to incorporate R&D activity and diffusion into a unified analytical framework. Whilst the issue of diffusion probably deserves to be treated at the length that Stoneman devotes to it, I am not convinced that there is a sufficiently important reason to separate the chapters on diffusion from the ones that follow. To my mind, they could be unified on the basis of one of themes that runs through the literature on the economic analysis of the process of technical change, excluding, for the moment, the theory on the impact of such change. This theme concerns the extent to which market equilibria correspond to social (welfare) optima with respect to a number of dimensions of this process. The most important of these dimensions are first, the amount of R&D undertaken by firms; second, the type of R&D project chosen by firms, in terms of riskiness: third, the outcome of R&D, in terms of the degree of standardisation of products; and fourth, the diffusion of the outcome of R&D. In all these respects it has been shown that market equilibria will not usually correspond to welfare optima, due to appropriability, externalities or market imperfection problems. This gives rise to a need for government intervention.

Stoneman covers the above issues in, respectively, chapters 9, 10, 11 and 6-8. With the exception of the first issue (which is not treated as comprehensively as I think it deserves), the rest of the literature is covered in sufficient breadth and depth. (Further, in the discussion of this first issue in chapter 9, I was surprised that Stoneman did not use more extensively the 1980 *Bell Journal* paper by Dasgupta and Stiglitz, rather than Nordhaus.) In addition, there is an original and very welcome chapter (13) on 'Technological change and the defence sector' and one on 'Technical change, output and employment' (14). This last chapter, as well as the chapters on diffusion, are based on Stoneman's recent contributions and his jointly published work with Ireland, David and Waterson.

A second theme that runs through much of the modern literature in this area concerns the interaction between technological competition and market dominance. The central question here is: does current market leadership confer advantages in patent races? In terms of welfare, the issue is of significance because first, incumbent monopolists may spend resources to obtain patents they do not intend to use ('sleeping patents') to preempt rivals and protect their position; second, even when this does not occur, welfare is reduced if the market becomes progressively more monopolised (for any given supply of innovations). Also, third, in an international trade context the loss of market leadership by the domestic firm implies an erosion of the share of oligopolistic industry profits annexed by the domestic economy.

This theme does not receive much attention from Stoneman (the issue of 'sleeping patents' gets some mention in chapter 9), but there is good justification for this given the nature of the book: work on policy issues as related to this theme is at its infancy, especially with respect to international competition. The existing work in the area with international trade aspects is treated (quite comprehensively, apart from the recent work of Brander and Spencer which, I think surprisingly, receives tangential attention) in chapter 12. I also found surprising the almost total lack of discussion on recent developments in the theory of co-operative research ventures by economists such as Katz and Shapiro.

In a final concluding chapter, Stoneman offers his personal view of UK experience in technology policy and makes a number of suggestions for what he considers to be the best way in which the government should intervene to correct the sub-optimal amount of R&D undertaken by the private sector in the UK, as well as non-optimal market outcomes related to the degree of risk-taking and to diffusion. I found the chapter full of useful insights obviously derived from the author's long experience in dealing with both practical and academic issues related to all aspects of the process of technological change. I can recommend this book without hesitation to all those with an active or potential interest in the economics of this process.

Yannis Katsoulacos

University of Liverpool

Beyond Computopia: Information, Automation and Democracy in Japan by Tessa Morris-Suzuki

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The enthusiasm with which certain influential government agencies, businessmen and academics in Japan have greeted the development of the new information and communications technologies and the arrival of the information society is probably unparalleled amongst developed nations. It is therefore timely to have a critical account of the history of the information society concept in Japan, the reasons for its emergence, the functions it fulfills in society, and the prospects for its realisation.

Morris-Suzuki argues that from the 1960s to 1980s, the officially accepted and propagated information image has shifted from that of an 'information