

Telecommunications Demand in Theory and Practice by *Lester D Taylor* (Kluwer Academic Publishers, Dordrecht, 1993), pp.xviii + 406, US\$132.50, ISBN 0-7923-2389-0.

Taylor's 1980 book, *Telecommunications Demand: A Survey and Critique*, underwritten by AT&T, quickly became the standard reference on this topic. The intervening years brought a massive growth in the literature, including a Special Issue of the journal, *Information Economics and Policy*, edited by Taylor, on telecommunications demand in 1988.

Most of what has happened in these years is, according to the author, "the result of the divestiture of AT&T and competition in markets that had historically been the preserve of natural monopoly. In transforming the legal and organisational structure of the industry, the divestiture created a number of new players and redefined the lines along which competition was expected to ensure. Fuelled by technological innovation in conjunction with the price distortions between the toll and access markets induced by many years of regulation, competition burgeoned not only in the equipment and toll markets as intended, but in the local market as well through "bypass", shared-tenancy, and mobile cellular services. All this has created new challenges for demand analysis". (p. 1)

Taylor was ideally placed for his task as much of the empirical work he discusses reflects studies and research in which he was involved throughout the 1980s at Southwestern Bell and Bell Canada and in very recent times in conjunction with the National Telecommunications Demand Study (NTDS). His new edition "has benefited from no corporate funding" (p. xvii).

The focus of the book is on North America. Despite the inclusion of several recent European and Australian studies, the need for comparative studies in other countries with a different mix of industrial, regulatory and cultural circumstances remains.

This is an important book for topics often covered in *Prometheus* but it is a technical work for readers with skills in economics and econometrics. This review, therefore, focuses on Chapter 11: Evaluation and Conclusions where Taylor outlines what we appear to know about the structure of telecommunications demand and then goes on to list what are in his view the areas of telecommunications most in need of research.

In 1980, he says "we knew a lot more about the demand for usage than the demand for access, a lot more about toll usage than local usage, a lot more about residential demand than about business demand, and we probably had more precise knowledge about price elasticities than about income elasticities: (p. 256). There were plenty of topics on which very little or nothing was known: e.g., international demand; business demand for terminal equipment; cross-elasticities between local and toll usage or between other categories of service. Network and call externalities and option demand were thought important but there was little empirical information.

Since then research has:

- Added greatly to knowledge of demand for residential access;
- Made a significant start in qualifying the structure of business demand;
- Improved earlier estimates of price elasticities;
- Made a start on providing estimates of cross-price elasticities between services; and
- Made a start in analysing the demand for custom-calling features.

Taylor highlights several achievements. First, innovations in modelling — a matter for specialists. Second, clarification of understanding of network and call externalities. In contrast to earlier thinking, which had been primarily concerned with whether network externality might be large enough to justify continuing the large toll-to-local subsidy, Taylor

emphasises the likelihood "that calls give rise to further calls, quite independently of price and income" (p. 259). He now prefers to assign a role not only to call externality but also to an independent phenomenon he labels "the dynamics of information exchange". To this reviewer, the acknowledgement that the exchange of information creates the need for further information marks an all-too-rare event when the narrower 'telecom economics' is brought into an analytical partnership with the wider, burgeoning information economics.

Researchers generally and in particular those in Australia should pay attention to the findings on the price elasticity/length-of-haul relationship. Taylor admits "surprisingly little is known about either the characteristics or motivation associated with calls to different distances" (p. 261). He then draws on a California study of 22,351 calls by 680 households.

- Half of all calls terminated within six miles of the calling party;
- Half of all calls lasted four minutes or less;
- There were significant differences between weekday and weekend calling;
- There were significant variations in call purposes:
 - 34 per cent to friends, 27 per cent to relatives
 - calls to friends were to shorter distances, similar duration, less costly and of lesser importance than calls to relatives
 - work-related calls were less frequent, shorter, less costly, and more important than social calls;
- There was differentiation of calls by callers:
 - two thirds were by wives
 - calls by teenage girls were longest
 - husbands were most likely to make calls to work
 - childrens' calls were predominantly to friends.

Against such background knowledge of physical and attitudinal characteristics of calling behaviour, Taylor seeks to interpret the research findings. To do so, he reminds us that price elasticity consists of two effects, an income effect and a substitution effect, and asks that we take account of the effect on utility of a call not being made, i.e., a call "may be important to the *earning* of income, rather than being simply a way of *consuming* it" (p. 262).

This leads to several conclusions. Work-related calls and calls for shopping and commercial recreation will be less sensitive to price than calls to friends and relatives. There may be no feasible substitute in work situations and in the shopping and commercial recreation situations, the cost of the call will be treated as part of the price being paid. This is why calls of less than six miles are most numerous, shortest in duration and have the smallest price elasticity.

For longer-haul calls, friends and relatives become more important in the communities-of-interest. "Since the opportunity cost of not making a call will in general be of less consequence, calls and calling will become more sensitive to price, which in turn implies a larger price elasticity" (p. 263-4).

Important neglected areas in the 1980s were business demand, international calling, the duration and time-of-day dimension of calling, and the behavioural relationships involved in income elasticities.

Taylor concludes with a short list of his research priorities: business demand; residential cross-price elasticities; separability (the relationship between telecommunications and other goods and services in households' budgets); dynamics of information exchange; option demand; and firm-specific elasticities (as monopoly suppliers have been replaced by duopoly or oligopoly).

As Taylor sees research agenda, "The challenge for demand analysis in the telephone

companies in the years ahead is to forge links with marketing departments and to become integrated into company budgeting and forecasting processes. Applied demand analysis has a strategic role to play in a competitive environment, ranging from the conventional types of elasticity estimation in traditional markets to the identification of new markets. The possibilities are vast. It only requires imagination, hard work — and some humility — on the part of economists and demand analysts" (p. 270).

'Restructuring' of telecommunications has hampered demand studies "as much of the demand data that had previously been available to the public became proprietary" (p. 3). In the US, research is being facilitated by the National Telecommunications Demand Study (NTDS), an on-going study of the demand for services provided by local companies which is a joint undertaking of INDETEC, Inc. CA., PNR & Associates, PA. and Taylor. The data set from this study has more than two million observations on both business and residential customers.

The studies of economists and demand analysts reported and commented upon by Taylor reflect a high degree of specialisation. Perhaps the most productive research, in this reviewer's opinion, will come through the cooperative investigation of the dynamics of information exchange. Taylor points to, e.g., a need to understand how communities-of-interest form (p. 268, n.19) but we can go further, adding how such communities cohere and disintegrate; how new information goods and services are adopted; how calls create need for further calls; how business (and more generally, organisational) needs for information are shaped and managed. To do so, we shall have to recognise the diversity in real world information and information processes and devise a rich taxonomy of information to replace the present all-purpose notion.

These lines of inquiry might enable us to cast light upon the much debated direction of causality in the telecommunications/growth process. Telecom economics can be informed by information economics and the joint product of their efforts might help provide the elusive theory of learning so much needed in economics.

D. McL. Lamberton
Australian National University

The Economics of Intellectual Property in a World without Frontiers by *Meheroo Jussawalla* (Greenwood Press, Westport, Connecticut, 1992), pp.158 ISBN 0 313 27620 X.

This book deals with two important developments in the world. The first is the global flow of information generated by information technology (IT). The second, which stands in sharp contrast to the first, is the creation of an international regulatory framework to deal with the rights of ownership in information.

These two developments cut across each other in important ways giving rise to many regulatory, economic and political issues. Jussawalla mentions many of these, including the following. Property rights, as both Adam Smith and Jeremy Bentham observed, help to create certainty of expectations. The grant of property rights in information, it might be thought, would encourage investment in the creation of information. The problem is that