on this and other developments in the field of solar technology. It is therefore a potentially useful source of information for policy analysts as well as solar technologists.

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Telecommunications and Economic Development *by Robert J. Saunders, Jeremy J. Warford and Bjorn Wellenius*
(Johns Hopkins University Press for the World Bank, Baltimore, 1983) pp. 395, $US32.50 (hb), $14.95 (pb), ISBN: 0-801-82828-7 (hb), 0-801-82829-3 (pb).

The authors have accomplished a comprehensive survey of needs and demand for telecommunications in less developed countries (LDCs). They focus mostly on the excess demand for telephones rather than on other costlier telecommunications services. This is justifiable on the grounds of funding constraints for low-income countries as well as for reasons of two-way communication needs of periphery people. The old paradigm of mass media being the most effective tool for socioeconomic development has been rightly set aside.

The beginnings of this book are best seen in an article by Saunders (Chapter 12) in *Communication Economics and Development,* Jussawalla and Lamberton (eds), Pergamon, New York, 1983. One of the authors of the book under review, Wellenius, in an article for *Telecommunications Policy* (March 1983, pp. 79-81) pointed out the lack of a framework for analysis when economists speak of telecommunications as a determining variable for economic development. These three authors have attempted to overcome this when they analyse the inadequacy of developing governments' investment in telecommunications infrastructure. Conventional tools of economic analysis have been used to quantify benefits of telecommunications services as well as to assess pricing, consumption, and distribution of such services. The difficulties encountered in the application of economic analysis to critical issues of communication policies have been adequately elaborated.

Right at the outset the authors have tackled the question so often raised by proponents of technology transfer, namely when costs of most telecommunications goods and services are declining, why is there a persistent shortage of investment in this sector in LDCs? There is no simple or straightforward answer. Data on economies of scale and network efficiencies are amply provided in the book. A discussion of the organisation and management of the telecommunications sector in developing countries forms the preamble to an in-depth review of the macroeconomic analysis of social benefits in Part II of the book. In this section the authors recognise the value-added aspects of telecommunications infrastructure, but encounter many difficulties in evaluating the benefits of telecommunications in quantitative or disaggregated terms, making the analysis more descriptive than analytical. There is sufficient evidence, however, to indicate that telecommunications is becoming a significantly important input in the production process and even a "factor of production" (p. 73). Statistics regarding telephone and telex densities are abundantly presented to support the aggregate correlation analysis and the shortcomings of this approach lead the authors to support the input-output methodology and sectoral analysis as better indicators of the value-added of telecommunications (see Chapters 4 and 5). An appraisal of the macroeconomic benefits includes a brief overview of the trade-offs between transportation and telecommunications. Not much evidence of this benefit for LDCs is forthcoming in the book.

In the section dealing with microeconomic analysis of the benefits of telecommunications (Part III), the authors again rely heavily on telephones as representing the entire gamut of telecommunications. They argue that telephones are more appropriate as a communications technology, but they exclude the networking of telephones with satellites and computers. Telematics as a probable future technology for economic development is overlooked. The World Bank's assistance to telecommunications projects is such a low percentage of its total lending program, that any justification for telematics expansion may at this stage have appeared premature for inclusion in the book.

Resource allocation, according to the authors, should be based on cost-benefit analysis. While this is true, the arguments for using this tool are linked with consumer surplus, which, at best, is an elusive method for measuring satisfaction. In developing countries 'the willingness to pay' is not a sufficient criterion for estimating satisfaction because it is not backed by purchasing power in the case of a vast majority of inhabitants. If they had access to purchasing power they would certainly be willing to have access to telecommunications services. Social costs can better be measured by shadow pricing, which the authors use for valuation of inputs. The price change method of estimating consumer surplus does not appear to be fully substantiated by the country examples cited from Costa Rica in 1976 and El Salvador in 1977. The internal rate of return as demonstrated by the willingness to pay is shown as high as 36 per cent in El Salvador and the telephone revenues of Costa Rica are cited as 50 per cent of the perceived benefits. This method involves several assumptions which tend to make the estimation arbitary. The authors have dealt with these assumptions and concluded that investment decision making at the micro level continues to be beset by the problems of quantifying indirect and intangible benefits. The use of shadow pricing will be a more reliable measure for decision makers than consumer surplus.

Rural and urban user characteristics of telephone networks have been explained in detail in Chapter 10, citing statistics from LDCs like Nepal, Upper Volta, Mali, Bangkok, Dhaka, Kenya, and other locations. Many such countries provide Public Call Offices (PCOs) in rural areas for reasons of economic development, social equity, and national integration rather than for revenues. The World Bank has been financing projects for these PCOs. Even so, the authors found that telephone access is dominated by the government and the business users so that its benefits are confined to elite groups.

The chapters on tariff policy (13 and 14) are most useful for developing country planners. Pricing for economic efficiency does not reflect demand elasticity in developing countries where telecommunications services are operated as state monopolies. The authors recommend tariffs based on marginal costs of the services, since marginal opportunity cost is in excess of marginal physical cost. In such a case, pricing the service is used as a tool for allocating the limited supply of telecommunications services. Usage sensitive pricing may not be justifiable in LDCs on account of skewed income distribution. This is the stand taken by the authors.

In the concluding chapter, strong emphasis has been laid on under-investment in the communications infrastructure and the reasons for this trend in the developing world. The sustainability of what is viewed as a natural monopoly becomes problematic in developing countries, but the authors do not offer any Ramsey-pricing type of solution. They prefer private sector competition and they have put forward several alternative methods of providing such competition side by side with regulation.

On the whole, the book is carefully documented and provides a wealth of information on the economic aspects of telecommunications services for the use of government policy makers, planners, and students of economic development.

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The Phone Book. The Future of Australia's Communications on the Line *by Ian Reinecke and Julianne Schultz*
(Penguin Books, Ringwood, 1983) pp. 270, $6.95, ISBN: 0-140-06710-8.

The *Phone Book* is an account of recent developments in the Australian telecommunications industry, focussing in particular on the emergence of pressures for the introduction of competition. It is a very useful book, certainly better than Reinecke's *Micro Invaders,* which is marred by a fairly simplistic argument with respect to the introduction of technology.

The authors review the split of the Australian Post Office into Telecom and Australia Post and follow the recent administrative changes within Telecom. They discuss government intervention in Telecom's operations in terms of the usual 'pork-barrel politics' approach of the Country Party, as well as in terms of the Liberal government's ideological commitment to free enterprise. The push for competition is examined in the context of developments in the US and the UK. In addition, the issues surrounding the satellite and cable television inquiries are examined; in particular, separation of control of the satellite system from Telecom meant that some competition was inevitable. The shift of the telecommunications unions from a fairly passive role towards an active participation in the political process is an important aspect of the industry.

These preliminary chapters provide a build up for a consideration of the Davidson Inquiry. In many respects the Inquiry and its aftermath have been an anticlimax — few were surprised by its conclusions, given the terms of reference and the composition of the committee. In addition, with the election of the Labor government, the Report's recommendations have been shelved. I feel that the Davidson Report gave a somewhat less enthusiastic endorsement for the introduction of competition than Reinecke and Schultz would have it. However, the Report was rather obscure on this vital point and left much to the discretion of the Minister.

The authors conclude that the winners from the introduction of competition will be large business firms, while the losers will be rural and, to a lesser extent,