

PERFORMANCE INDICATORS FOR PUBLIC TELECOMMUNICATIONS OPERATORS

SUMMARY

This report is concerned with indicators of performance for public telecommunications operators (PTOs). The central question being posed is as follows:

How can the performance of a public telecommunications operator be measured, by what standards should it be judged, and how does it compare with similar companies in other countries?

This report is written primarily to assist in the formulation of regulatory policy towards public telecommunications service providers. Most of the discussion is restricted to the main national carrier of telephone traffic. However, the findings of the report should also be of interest to the management of PTOs, their competitors, and the users of their services.

The report addresses a sector which is currently undergoing a transition in most OECD countries from a monopoly to a competitive environment and from a single-service to a multi-service market. Public telecommunications is characterised by rapid technological change and a shift in popular perception concerning the role that the PTO should fulfil. The context is therefore one of structural adjustment in which some countries have progressed further than others but in which no country remains unaffected.

The approach taken here is in four parts: firstly, methodologies for the international comparison of tariffs for voice telephony and other telecommunications services are analysed; secondly, measures for the analysis of tariff structure are developed; thirdly, indicators of service quality are examined; and finally other measures of performance, such as efficiency and productivity, are considered.

In **chapter two**, existing methodologies for international comparisons of telephone tariffs are considered including the models proposed by Siemens (Germany), AFUTT (France), Logica Consultancy Ltd (UK), Mitchell (USA), OFTEL (UK), Telecom Australia and the US Bureau of Labor Statistics (see Figure 2.5). These approaches were discussed in detail at a Workshop on telephone tariff comparison methodologies held at the OECD, November 14th-15th 1988. While previous research is rich in content and often innovative in overcoming problems of compatibility between tariff structures, nevertheless *it is concluded that there is no single model currently available that would fulfil all the requirements for consistent and unbiased international comparisons*. The main shortcomings

of the existing research are that they are biased towards the tariff structure of the home country and that they are essentially static models which cannot easily accommodate changing patterns of telephone use.

In **chapter three**, proposals are put forward for a harmonised methodology for tariff comparisons that would combine elements of existing models. A series of “guiding principles” for the construction of a harmonised methodology are outlined in Figure A. The main methodological advances contained in the OECD approach are that the call distribution matrix is not tied to the tariff structure of any one country and that the ratio between fixed and usage charges is dynamically assigned according to average OECD usage patterns and subscriber telephone bills. Two sub-sets of the model have been defined to cover business and residential users but the methodology has been designed to be flexible enough to be extended to a much wider range of interest groups. The model is applied to a basket of national calls in OECD countries expressed in US dollar exchange rates and purchasing power parities (see Figures 3.8, 3.9a and b), and is subjected to a sensitivity analysis of the main parameters and assumptions. The OECD model is shown to be fairly robust, but the discussion highlights the need for further research, especially on subscriber call patterns.

Figure A
GUIDING PRINCIPLES FOR INTERNATIONAL
TELEPHONE TARIFF COMPARISON METHODOLOGIES

1. The methodology for tariff comparisons should initially be developed for national, non-mobile, real-time, voice telephony charges and later extended to a wider range of services including international calls, leased lines, packet-switched data services and mobile communications services.
2. The methodology should include installation charges, subscription charges (rental) and usage charges, but should exclude equipment rental. Tax should be included in the basket for residential subscribers but excluded from that for business subscribers.
3. Rather than simple rate comparisons, the methodology should use a basket of charges composed of fixed charges and national call charges. These two components should be calculated separately and then combined in a ratio which approximates to the OECD average revenue pattern for Public Telecommunications Operators (PTOs) and weighted according to average annual subscriber telephone bills.
4. The fixed charges should include annual subscription (rental) plus a proportion of the installation (connection) charge for new subscribers.
5. The usage charges should be proportional to the fixed charges and should include both local and long distance charges. They should be based on a basket of calls distributed by distance, time of day/week and duration according to usage patterns identified in international research.
6. A separate basket should be calculated for international calls using call pairs weighted by the likelihood of calling a particular destination (approximated by the value of telephone revenues of the called country).
7. Separate baskets should be constructed to reflect distinctive usage patterns, for instance for business and residential subscriber groups.
8. The preferred units for comparison are purchasing power parities (PPPs) expressed in average US Dollar values for the previous year.

Note: For full explanation, please see chapter three.

For international call charges a separate model is developed using call pairs; the cost of making the same call in opposite directions. In this way, it is possible to express the cost of a weighted basket of outgoing international calls from any one country as a function of the cost of incoming calls (see Figure 3.14). In the remaining parts of chapter three the OECD

tariff comparison model is extended to cover mobile communications, leased lines and packet-switched data communications.

In **chapter four**, the separate elements of the tariff structure of different countries are examined in detail drawing upon the insights gained from the tariff comparison model. The theory of the pricing of services is explored and certain key ratios are examined such as fixed charges to usage charges, local to long distance call charges, and national to international calls. The experience of rate rebalancing in the OECD countries is reviewed in the light of processes of on-going regulatory reform. There is a general trend away from value-based tariffing towards a closer cost-orientation which is evident in an increase in the value of fixed charges relative to usage charges, a reduction of the distance element and a fall in the cost of international calls. Rebalancing has proceeded furthest in the countries which have liberalised their telecommunications environment and introduced competition, notably the USA and the UK. However, there is little evidence that the processes of rebalancing have speeded up the rate of tariff reductions in real terms. Rather, the main pressure for downward prices is coming from technological change and is common to most of the OECD countries.

In **chapter five**, the focus shifts away from tariffs to quality but with attention to the close link which exists between the two. It is argued that in a competitive environment, the monitoring of quality and the passing on of this information to the consumer will become increasingly important. At present there is surprisingly little literature on the economics of quality in telecommunications and few countries have statutory, or even formal, requirements for monitoring quality trends. The current status of quality of service reporting is examined, firstly by country and secondly by indicator. Finally, a small number of basic quality indicators is selected that could form the basis for international comparisons adhering to a harmonised methodology. These are summarised in Figure B.

Figure B
OECD RECOMMENDATIONS FOR QUALITY OF SERVICE INDICATORS
FOR PUBLIC TELECOMMUNICATIONS OPERATORS

Indicator	Measure
1a) Waiting time for connection	Average waiting time (months) for new telephone installation or transfer of connection
b) Delivery precision	Percentage of applications for new telephone installation or transfer of connection met within half a day of agreed appointment between subscriber and PTO
2) Effective payphone density	Number of payphones per 1000 inhabitants multiplied by percentage operational
3) Call failure rates	Percentage of calls failing during busy hour due to equipment failure or network congestion
4) Fault reports	Number of technical faults reported by subscribers per 100 main lines per year
5) Fault clearance	Percentage of technical faults reported by subscribers cleared by end of next working day
6) Response time for operator services	Average delay between completion of dialling of first call and response by operator or directory enquiries, including redialling if line is busy

Note: For full explanation of indicators, please see Section 5.5

In **chapter six**, a range of additional performance indicators are considered. These relate to the size and growth of the PTO in terms of revenues, network size and penetration rates; the cost structure and income sources of the PTO; investment in capital equipment and R&D; and measures of network utilisation and productivity.

In **chapter seven**, the conclusions of the research are presented. This chapter, which was written following a Workshop of experts held at the OECD on 6th-7th November 1989, includes a summary of the 25 proposed performance indicators, an analysis of why performance disparities may arise, some directions for future research and a set of guidelines for the use of performance indicators. The aim of this report is to provide regulators with a set of methodological tools that can be used to evaluate PTO performance and to establish a benchmark of data showing the standards currently achieved in the OECD countries. While this report is probably the first comprehensive international survey of performance indicators for telecommunications, it will hopefully not be the last, for this is a rapidly changing field. For this reason the approach has been kept as transparent as possible with worked examples of the models used in an appendix. It is hoped that the proposals put forward for guiding principles for tariff comparisons and the choice of indicators of service quality will be adopted and refined by future researchers.