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# TELECOMMUNICATIONS *and* UNIVERSAL SERVICE

INTERNATIONAL EXPERIENCE  
*in the* CONTEXT *of*  
SOUTH AFRICAN POLICY REFORM



SEÁN Ó SIOCHRÚ

INTERNATIONAL DEVELOPMENT RESEARCH CENTRE

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INTERNATIONAL DEVELOPMENT RESEARCH CENTRE  
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# TABLE OF CONTENTS

|  |      |
|--|------|
| Foreword .....   | v    |
| Preface .....  | vii  |
| Acknowledgments .....  | viii |
| Chapter 1. Introduction .....  | 1    |
| Context and terms of reference .....   | 1    |
| Report structure .....   | 2    |
| The problem of universal service: affordable access .....                                  | 2    |
| The Information Age: effective use .....   | 4    |
| Chapter 2. Provision of Universal Service: State Monopoly or<br>Private Competition? ..... | 5    |
| Structural tendencies .....  | 6    |
| Nonstructural factors .....  | 7    |
| Conclusion .....   | 18   |
| Chapter 3. Instruments, Measures, and Requirements for<br>Universal Service .....          | 21   |
| Sources of finance and investment control .....  | 22   |
| Instruments for universal service .....  | 26   |
| Chapter 4. The Universal Service Agency: Some Conclusions .....                            | 39   |
| Diverse demands .....  | 39   |
| Avenues to explore .....   | 42   |

Chapter 5. International Experience in Regulation and  
    Universal Service ..... 47  
    Some relevant experience ..... 47  
    Future research possibilities ..... 64

Appendix A: Statistical Comparisons of Teledensity and  
    Network Growth. .... 75

Appendix B: Tariff Averaging and Cross-Subsidization ..... 79

Appendix C: *Universal Service or Telecommunications for  
    Development?* ..... 87

References ..... 91

## FOREWORD

The idea for this book grew out of the International Development Research Centre's (IDRC's) involvement with the South African National Telecommunications Policy Project. The book is intended to provide valuable input to the Universal Service Agency, which will be created under the *South African Telecommunications Act* to be presented to Parliament in 1996. The agency will work closely with the new South African Telecommunications Regulatory Authority and will try to keep universal service at the centre of South African telecommunications policy and debate.

The new democratic Government of South Africa approached IDRC shortly after the 1994 elections to seek support for its efforts to reform the telecommunications sector. The resulting National Telecommunications Policy Project was funded jointly by IDRC and the Canadian International Development Agency. Technical, logistical, and administrative support was provided by IDRC, but leadership was firmly in the hands of Willie Currie, advisor to Dr Z. Pallo Jordan, the Minister of Posts, Telecommunications and Broadcasting.

The project began early in 1995 with the preparation of a Green Paper by a team of South African and international specialists. The Green Paper was published in 4 of South Africa's 11 official languages and given wide distribution and publicity. It attempted to identify the key issues for the sector and posed questions about the relationship between telecommunications and broader economic and development issues. It represented one of the first attempts in South Africa to draw the stakeholders and the interested public into a broad debate on relatively technical issues that would have important implications for the future of South Africa in the global "Information Society."

The Green Paper elicited about 1 500 pages of comments; these were analyzed and synthesized into a draft White Paper, which was then presented to a number of stakeholder groups, refined through discussions with a group of eminent specialists, and eventually approved by Cabinet for transformation into draft legislation. The whole process was accomplished within a year.

IDRC was closely associated with the project and was particularly interested in the challenge facing South Africa: universal-service delivery in a country that, from a communications perspective, combines the needs of a highly sophisticated first-world urban business sector (with communications needs critical to investment and economic growth) with the needs of a vast, underserved population in urban townships and rural communities, mainly without access to even basic telephone service.

The services delivered over telecommunications networks can provide enormous opportunities today: for education, for health care, for income generation, and for access to, and communication with, all levels of government. To benefit, countries must find ways to deliver such services to their entire populations in an affordable way and using technologies — and supporting systems — that enable effective use.

This publication is intended to suggest some approaches to the delivery of universal service: What institutional, financial and technological arrangements have been tried elsewhere, and how successful have they been? Are they more effective with a monopoly or in a competitive environment?

The idea for the publication owes much to Willie Currie, who, as advisor to Ministers Pallo Jordan and Jay Naidoo, has managed the reform process with enormous skill and has provided IDRC with the opportunity to develop an understanding of critical telecommunications issues that we hope will be useful elsewhere.

The manuscript was prepared by Séan Ó Siochrú, whose experience and many contacts all over the world have enabled him to bring a broad perspective to the problems under consideration.

**Kate Wild**

Senior Advisor

Information and Communications

Regional Office for Southern Africa

IDRC

## PREFACE

This report presents the results of research carried out between January and April 1996 by NEXUS Research Cooperative for the International Development Research Centre's Regional Office for Southern Africa. The contents are based on existing published and unpublished material and on personal communications with experts around the world.

**Seán Ó Siochrú**



## ACKNOWLEDGMENTS

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Kate Wild of the International Development Research Centre and James Cornford of the Centre for Urban and Regional Development Studies in Newcastle provided invaluable guidance, support, and commentary throughout, and the comments of Muff Andersson and Robert Horwitz are also greatly appreciated.

## CHAPTER 1

# INTRODUCTION

### **Context and terms of reference**

Telecommunications policy is always a balance between economic growth and social justice. Universal service is, in general, most concerned with the latter. The South African government's "Green Paper on Telecommunications Policy," for instance, underlines the ability to pay and equity in its objective of "provision of a telecommunications line and access to services available on that line to every applicant upon request at affordable/equitable prices." Note that *universal service* means "a telephone at the premises or house," whereas *universal access* means "a telephone within a reasonable distance."

The balance to be struck between economic and social priorities in South Africa, however, will be fairly unique in a couple of ways, and universal service is by no means concerned solely with social justice.

First, for historical reasons, the extent of injustice in the system is even greater than in the polarized networks of other similarly developed countries. Second, the requirements for economic growth are distinctive: a relatively developed business sector desperately needs the most advanced and competitive telecommunications system to reassert itself in the national and world economy, but the future economic prospects of the mass of the population depend largely on encouraging and supporting a great number and variety of small, local-level economic and job-creation activities. Not only big business but hundreds of thousands of microbusinesses must be supported if South Africa is to succeed in its aims.

This report was prepared in the context of a national effort to develop a telecommunications policy to achieve these aims. Following an extensive consultation process and the publication of a White Paper, a number of areas required further consideration and elaboration. The objective of this short study was to produce background information of relevance to the Universal Service Agency and

involved the identification of a number of countries whose experience appeared relevant to this question; and an examination of this experience in some depth.

### **Report structure**

Below, we will first sketch out some central concepts pertaining to universal service, briefly alluding to its likely evolution in the context of the global “Information Society.”

Chapter 2 will then confront an issue that cannot be avoided in debates on the provision of universal service: state monopoly versus private competition. The chapter first describes the dangers for universal service posed by the inherent forces released by liberalization in a hypothetical unregulated “pure” form. It will then somewhat provocatively highlight the important influence of nonstructural factors (those that are not derived from industry structure) on the achievement of universal service. The point will be to illuminate the significance of the concrete characteristics of any given country and the constraints on it to consider when assessing the regime that might be most appropriate in the long run.

With the scene set, Chapter 3 will begin the description of the instruments, measures, and requirements for the pursuit of universal service. These can be organized in a number of ways, but their complex intertwining and overlapping nature means there is no single correct way. The presentation will attempt to draw out their key structural interrelationships, the limitations of each, and their relationship with different industry structures.

Chapter 4 will discuss the diverse demands the proposed Universal Service Agency must meet and will suggest possible avenues to explore in meeting the challenge.

Chapter 5 will provide more detailed descriptions of telecommunications-industry structures, regulatory regimes, and universal-service instruments and actions on a country-by-country basis. The countries will be ranked loosely by relevance.

### **The problem of universal service: affordable access**

Figure 1 offers an overview of the challenges for universal-service delivery. The aim of the figure is simply to outline some of the major relationships and dynamics among the different elements. Subsequent discussions will refer back to these at various points.

For the purposes of universal service, users can be divided broadly into four groups:

- Commercially feasible users currently supplied with service;

- Commercially feasible potential users who for various reasons are not yet supplied with service;
- A number of currently subsidized customers, some in urban areas on very low incomes with low usage levels and others in isolated rural areas that are very costly to provide with service (although these rural users perhaps have relatively high incomes); and
- Commercially nonfeasible potential users currently lacking service.

Figure 1 is not, of course, drawn to scale for South Africa. But a number of general dynamic relationships still apply. First, the size of unsatisfied commercially feasible demand is important because this can provide “leverage” to subsidize noncommercial demand. The key requirement for fulfilling this demand is investment capital. Second, there are a number of ways commercially nonfeasible customers can become feasible; that is, point A on Figure 1 can be moved to the right:

- The criteria of commercial feasibility may change through diminishing cost of investment capital, possibly combined with lower expectations for the rate of return;

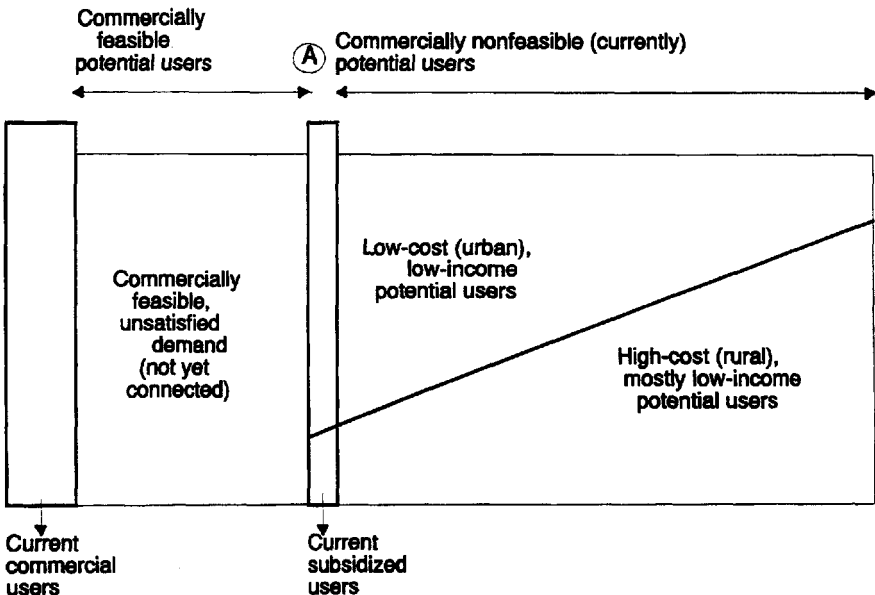


Figure 1. Categories of customers (potential and actual) relevant to universal service.

#### 4 TELECOMMUNICATIONS AND UNIVERSAL SERVICE

- The calculation of commercial feasibility can also be revised through, for instance, including in the equation the long-term return to the economy as a whole, including (among other matters) the relative overall levels of economic benefit that can be derived from rural access and from urban access;
- The costs of service provision can fall, for instance, through the introduction of new technologies; and
- The income of potential customers — and the amount they spend on telecommunications — can increase.

The trade-off between providing universal access and providing universal service is also important because many low-income urban users already have reasonable access.

#### **The Information Age: effective use**

A new parameter of universal service may soon figure more prominently alongside the above. The much heralded dawn of the Information Society, though little in evidence in many parts of the world, will significantly alter and supplement our current notion of universal service (Ó Siochrú et al. 1996).

Traditionally, universal service refers to access to services at affordable prices, and this will remain at the core of the concept. But the assumption — reasonable in the case of telephony — is that users can get on with reaping the benefits themselves. In the context of the Information Society, more sophisticated use can be made of the basic network for Internet services, data and file transfer, electronic data interchange (EDI), and so forth. The effective use of these services cannot be easily taken for granted. Here, reaping the benefits requires at least a higher level of knowledge and skills and usually some specialized equipment, such as computers.

This implies that universal service must concern itself not simply with provision of affordable services but also with support for effective use. Thus, the expression “affordable access, effective use” sums up universal service for the Information Society.

## CHAPTER 2

# PROVISION OF UNIVERSAL SERVICE: STATE MONOPOLY OR PRIVATE COMPETITION?

There has been much debate on the relative merits of state monopoly and private-sector competition for the provision of universal service. Each can muster extensive evidence to support its cause. None can deny the impressive level of universality of service achieved under monopoly conditions in Europe, in many developing countries, and elsewhere. On the other hand, much private-sector-inspired research has drawn attention to changes in the fundamental structure of the industry and to strong growth rates under some more liberalized conditions.

Yet no conclusive arguments have been put forward to convince the impartial reader. There are a number of reasons for this, aside from the fact that there are few impartial writers. There is, for instance, insufficient well-documented, comparable experience to draw on. Furthermore, it is often difficult to distinguish temporary from long-lasting effects, and aggregate data are often insufficiently differentiated to allow one to discern spatial and sectoral impacts.

At present, even the most exhaustive study of the experience of universal service under monopoly and under more liberalized conditions would fail to establish the superiority of one over the other. This is because the regime, either state-owned monopoly or privately owned competitive supply, is seldom the key issue in determining the likely outcome for universal service. Any regime is implemented within an environment of internal and external constraints and possibilities — including the inherited telecommunications sector — and in a specific historical context. Thus, comparative studies often reveal contradictory outcomes, with, for instance, short-term gains being followed by long-term losses (e.g., Straubhaar et al. 1995).

In this chapter, we will first argue that state monopoly and competitive supply, fundamentally different types of industry structures and regimes, are not neutral in relation to universal service. A liberalized regime has an inherent

tendency to inhibit and even curtail universal service in certain ways, a tendency always alleviated by some form of regulation, whereas a state-owned monopoly is much more at the behest and mercy of policy.

Nevertheless, then we will argue that relatively arbitrary constraints and opportunities, which vary from one country to another, can be far more influential than the structure of the industry as a determinant of the universality of service. Policy and research efforts should therefore be more firmly focused on these factors than on the type of regime.

### **Structural tendencies**

A number of points of tension between liberalization and universal service derive from the establishment of competition as the central dynamic of development. Competition, in contrast to (and usually succeeding) monopoly, fundamentally alters the imperatives imposed on the different actors and ultimately strongly influences the tariffs charged, the reach of the network, and the services available to users (see Ó Siochrú et al. 1996, chapter 9, for detailed argument). These points of tension are as follows:

- Competition tends to bring tariffs into line with costs through rebalancing, which usually implies increasing (relatively) the charges for initial connection, line rental, and local calls and decreasing the cost to users of international and long-distance services and leased lines. The immediate benefits therefore go to those customers who make most use of international and long-distance services and leased lines, that is, to large firms. Conversely, rapidly rising tariffs charged to domestic subscribers would lead them to reduce usage or even to disconnect from the network.
- In a competitive environment, there are strong incentives for telecom operators not to extend services to customers or areas where revenues generated (at prevailing averaged tariffs) are lower than the costs of providing service. Such uneconomic customers and areas are mainly found in rural, peripheral, and less favoured regions.
- As attested to by the experience of liberalized countries, the benefits of liberalization in terms of new investment in enhanced or new services have uneven geographic distribution. Telecom operators have little incentive to serve areas with low effective demand or high costs of service provision. New services are therefore offered in the central

business districts of major cities and other areas of business concentration and reach rural and peripheral areas (even in cities) only later, if at all.

Thus the internal logic of liberalization and competition is to restrain the growth of universal service in three directions: the tariffs charged, the geographic scope of basic services, and the introduction of new services, with a strong bias toward large corporate users in urbanized areas. For these reasons, the introduction of competition is almost always accompanied by regulation.

This is not to say that public monopoly will always work better for universal service. But a task of the regulator in competition is to implant and sustain tendencies that go against the grain of competitive forces, whereas in private monopoly, the regulator must thwart the tendency to use monopoly power in the interests solely of maximizing profits and return to the investor. Indeed, the situation in many liberalized countries, especially for local service supply, is a de facto monopoly or, at best, a duopoly with a single dominant player. Here, the need for competent and firm regulation is, if anything, even more pressing, and its role in simultaneously directing the competitive pressures and the profit motivation presents a complex challenge. The United Kingdom is a good example of the enduring nature of this task.

A publicly owned monopoly, on the other hand, may not require regulation per se to keep universal service high on the agenda but only to maintain a direct link to policy. If such policy is weak, compromised, ill conceived, or poorly informed, then universal service is in jeopardy. But a vigorously pursued, well-formulated, and informed policy with a reasonably conducive external environment has the optimal chance of succeeding.

There is thus no inherent tendency of a public monopoly toward or against universal service. Universal service must rely first on the orientation, capacity, and determination of the policymakers and ultimately on those of the government. With these in place, the degree of success will be a function of a range of concrete circumstances and constraints as much to do with factors outside the telecommunications sector as with those inside it.

### **Nonstructural factors**

Competition, in the imperatives it imposes on actors, therefore sets in motion a number of trends that are harmful to the provision of universal service and that inevitably require regulation. A public monopoly, by contrast, is in principle driven by policy, rather than by an internal logic. Such policy, if it is to serve universal service, must in turn be translated into regulations, mechanisms, and



actions. In Chapter 3, we will describe these in some detail for both competition and monopoly, but here, we will flesh out the factors that very often exert a greater influence on the promotion of universal service than the structure of the sector per se. Such factors manifest differently in monopoly and in a competitive environment, and the type of regime clearly influences not only how they might be addressed but also to what degree of success. However, the relationship is often complex and mediated, rather than straightforward as often portrayed, and the outcome is contingent and uncertain.

The successful or unsuccessful provision of universal service may be traced along a number of interdependent parameters, including the following:

- *The scale of the challenge* — the level of teledensity (lines per 100 population), the level of economically feasible unsatisfied demand, and the unevenness of teledensity territorially and among different groups;
- *The capital resources available* — access to investment capital and the terms on which it is available (for instance, the expected rate of return and recoupment time);
- *What can be achieved with capital investment* — the efficiency and cost effectiveness of network deployment and operation and the range of possible technical solutions; and
- *The scope for tariff flexibility* — especially the extent and type of cross-subsidy possible between different tariffs, services, and user groups.

In the remainder of this section, a few of the major factors influencing these parameters are considered. The aim is to illustrate some of the ways the concrete circumstances of a country will influence how different types of regimes can retard or promote universal service. (Statistical comparisons of teledensity and network growth are given in Appendix A.)

### **The scale of the challenge**

The strongest claims for the virtues of monopoly over competition, and vice versa, are often staked out for less-developed networks with low teledensities. The previous section supports the argument for monopoly by showing how liberalization sets in motion certain trends that are potentially detrimental to universal service. However, it also underlines the fact that regulations can be introduced to counter these risks and in some cases lead to a net contribution to

universal service. Claims for the absolute superiority of one or other approach are thus unsustainable.

### *Political considerations*

The efficacy of regulation in pursuit of universal service will depend greatly on the strength of political commitment. Those who support the cause of universal service in countries with very poorly developed networks may find it especially hard to muster public and policy support, for reasons rooted in political realities. Where teledensity is already reasonably high, there is likely to be considerable resistance to the greatly increased local tariffs and connection fees that competition tends to bring about. Thus, the maintenance of universal service, including low connection fees and local tariffs, is likely to be a high priority for regulators introducing liberalization. This is the case, for instance, in a number of countries of the European Union (EU) (Ó Siochru et al. 1996).

However, in countries with low teledensity, the introduction of liberalized services, even at high connection fees and tariffs, is likely to encounter little resistance because it will meet the needs of at least some customers, albeit only the well-off minority. In these situations, and in the absence of dissenting voices, universal service may be sacrificed to the needs of such customers. This has been the case in most of the countries of Central and Eastern Europe (Berlage 1995). There, liberalization is being introduced, but universal service in most countries is accorded a low priority, and services such as cellular mobile can command very high tariffs in the absence of an alternative.

Sudan offers a stark example of a least-developed country where a desperate need for investment capital has led to virtually total neglect of universal service in the context of privatization. In 1992 the more profitable and efficient parts of the government-owned provider were disentangled from the national operator and made into a new company, the shares of which were sold. Despite very generous conditions to encourage private-sector participation, including an exclusive licence for international services, a low valuation, and total private-shareholder control, the offer failed to have the desired effect, and so far progress has been uncertain. But the government-owned provider — with its staff inflated after the new company took only what it needed — must now grapple with the problem of providing services to the poorest areas with no definite cross-subsidy from profitable areas. The Deputy Director General admits that they have no idea how they can achieve this (Yousif 1994).

The situation of inflated staff raises a second key political issue. Technological and organizational developments have certainly increased the potential productivity of staff, thus reducing the numbers needed to support the same level

of service. In a drive to greatly increase network density, the employment effects of allowing new competing operators will be very different from the employment effects of investing in the existing operator so it can expand and retrain its excess workers. The political implications of mass redundancies of existing workers (even where some are promised jobs with competing operators), are major determinants of the outcome. Furthermore, investment focusing primarily on the commercial sectors may generate fewer jobs than that focusing on universal service.

Thus, the political circumstances of countries with least-developed networks may further reinforce the tendency of liberalization to bring services only to commercial users or at least to hinder the maintenance of universal service at the centre of policy, especially where trade-union influence is weakened. Indeed, partly in growing appreciation of this, the earlier rush to liberalization in Central and Eastern Europe (where trade unions had little influence) has more recently been reconsidered, and more complex regulatory arrangements combining competition in some services with monopoly in others are being devised, for instance, in Hungary. In other parts of the world, such as in the Philippines, trade-offs between commercial and noncommercial customers have been devised.

Political pressures resulting from the recent changes in South Africa are twofold. On the one hand, there is an urgent need to remedy the imbalances of the past in all domains, including telecommunications. On the other, there is a need to ensure that traditional industrial sectors do not slip behind international competitors; the availability of low-cost, high-quality advanced services can play a part in ensuring this. Thus, any moves toward liberalization would have to consciously and explicitly maintain a carefully balanced approach to these twin requirements. The position of the trade unions on the employment implications is also likely to play a central role in the outcome.

#### *Unfulfilled demand*

The trade-off solutions mentioned above demand a strong regulatory policy, which is in turn bolstered by the existence of a lucrative subset of customers against which loss-making services can be offset. Such unsatisfied but economically feasible demand does exist in quite a number of countries where the development of the telecommunications network has lagged behind that of other infrastructures. As earlier alluded to, the extent, type, and location of this pent-up economically feasible demand in relation to the overall level of unsatisfied demand (economic or not) are key variables determining the speed with which universal service can be achieved and the strategies that can be deployed.

Clearly, more rapid progress will be made and a greater variety of approaches can be pursued where a large portion of the unsatisfied demand is

economically feasible. There are indications that South Africa does have considerable unsatisfied demand, particularly among the black population (Koning and Bles 1994).

How soon this demand can be satisfied (even, to some extent, the size of this demand) is a function largely of the availability and terms of investment capital. Once telecommunications is established as a priority, the speed with which demand can be met is not inherently determined by whether supply is monopoly based or competition based. The supply of investment capital is the paramount consideration.

### **The capital resources available**

#### *Sector-internal investment*

Investment resources internal to the sector are derived mainly from tariff income. The extent to which profits are reinvested (leaving aside for a moment the size of profits or the priorities to which they are directed) is a question ultimately of how much is taken out. Some state-owned providers are treated by governments as major net contributors to general exchequer funds, especially where international accounting rates generate hard foreign currencies. Governments can also impose hefty licence fees on private operators without reinvesting such fees in the sector. Many publicly owned operators (including Telkom in South Africa) are also burdened with large debts (built up over a number of years), the repayment of which can absorb much of the operating profits. Somewhat ironically, it has only been in preparation for privatization that some governments have agreed to reduce such debts, which suggests that funds can be found in the right circumstances.

However, privatization does not necessarily stem the outward flow of profits, because there is increasing concern about the payment of high shareholder dividends. Since privatization of British Telecommunications plc, for instance, dividends have grown markedly as a percentage of sales and on a per-line basis, costing 1.7 billion United States dollars (USD) in 1995, and this is perceived as a growing problem (Heyworth 1995). Furthermore, multinational operators are using profits to fuel expansion plans outside the country where they are actually generated. For instance, Telecom NZ in New Zealand distributed 91.4% of its 620.2 million NZD (in 1996, 1.44 New Zealand dollars [NZD] = 1 USD) net profits in 1994/95 as dividends to shareholders, of whom the majority were foreign. Bell Atlantic and Ameritech between them owned 49% of the company, and other foreign investors owned more. Adverse effects on the already poor trade deficit were a growing concern (PTTI 1995).

*Sector-external investment*

Investment comes not only from profits but also from sources external to the sector. A number of factors have resulted in greater availability of investment capital to the private sector than to the public sector and governments.

A general period of economic crisis exerts extreme pressure on government expenditure, especially in developing countries struggling with large external debts, so that direct state-capital injections become difficult. This is exacerbated by the high proportion of hard currency required for network development.

The environment for loans has also deteriorated. The World Bank, whose influence extends far beyond its own relatively small loans, shifted its policy toward refusing to fund any government-run monopolies resistant to market reforms leading to privatization and competition (Lynch 1995; Urey 1995). Furthermore, loans granted are in effect often conditional on recipients' investing in ways that satisfy the needs of transnational capital rather than those of the mass of the population, such as in the Philippines (Sussman and Lent 1991) and in Malaysia (Lent 1991). Kenya offers an example of the reluctance of bilateral and multilateral development programs to invest in rural telecommunications: only about 15% of the 270 million USD invested in the decade after 1984 could be raised from these sources (Muigua 1994). All these factors have reduced the flexibility of investment capital and its availability to the public sector.

However, actions have been taken to enhance the attractiveness of publicly owned monopoly operators from the point of view of lenders. The most common of these actions in recent years has been the corporatization of the operator, with the government being the main shareholder, which reduces political risks and increases the accounting transparency of investment. A clear declaration from government (as the major shareholder) to reinvest rather than to extract profits also helps. Furthermore, subdivision into regional companies and service-specific companies can secure loans, but there are also clear dangers here for universal service because the lender can more easily pick and choose the most attractive regions or services for investment. However, governments can sell telecommunications development bonds to those seeking a telephone; these bonds mature after a specified period and yield competitive interest rates. A simple tax destined for network extension can also be levied on telecommunications bills and justified by the increase in utility resulting from additional users. Both these options (and other similar ones) depend on the general economic circumstances of a given country.

Overall, investment resources available for direct private investment in telecommunications companies have been much higher in recent years: the private sector accounted for more than 40% of investment in developing countries in the 1990s, compared with just 5% in the 1980s (Lynch 1995), and its role is still

growing. Not all of this comes from national or international private-sector investors: most of the private national investment in the Chilean and Venezuelan privatizations, for instance, came from “social capital,” such as pension funds. (Barrera 1995). There have also been many direct sales of shares to the public, such as in the United Kingdom and Mexico.

Private-sector investment is by no means indifferent to sector structure. On the contrary, investors are far more likely to be attracted by the prospects of effective control of a monopoly supplier than they are by competitive supply and are willing to invest more because uncertainty is greatly reduced and the potential for profit is higher. In general, Latin American countries have been more willing to cede a controlling share than their Asian counterparts, although very recently a desperate need for cash has forced the government of Pakistan to put total control of its operator on sale (APTA 1996e). In Argentina, the interest of bidders for privatization was in direct proportion to the extent and duration of the monopoly or exclusivity to be granted (González and Luis 1992). In Latin America, a period of exclusive supply of certain services is a feature of many privatizations, although in some cases this is designed to maximize returns to the exchequer, rather than investment in the sector. In Mozambique, the operator has attracted private investment from outside the sector by entering into joint ventures to offer ancillary activities, such as vehicle maintenance, telecommunications consultancy, and production of telephone directories (Fernandes 1994a).

A relatively stable environment for investors can also be offered by build–operate–transfer (BOT) and build–transfer–operate (BTO) schemes, whereby networks are built with private capital but revert to public ownership immediately after construction (BTO) or after a longer period (BOT) and tariffs are shared according to an agreed formula. Thailand, for example, is taking the BOT approach; Malaysia, the BTO approach. BOT and BTO schemes may even offer a greater degree of stability where a degree of competition is permitted. Despite greater uncertainty and profits, competitive supply offers the opportunity to attract investment from a larger set of investors, especially where the target volume of investment is significant and can better be addressed if it is broken into separate parcels among competing licencees.

However, a number of problems must be considered in seeking private-sector capital. Private capital tends to come with a more restrictive set of conditions than state capital. The private sector in general demands a higher and more secure rate of return, as well as a shorter repayment term, for its capital expenditure on telecommunications. There are a number of reasons for this. For instance, private-sector investors cannot capture for themselves the beneficial externalities generated (the benefits accruing to users and to others outside the

sector that exceed the value of tariffs paid), and the *raison d'être* of private firms is to maximize returns to shareholders, not to increase general welfare or development. Furthermore, any sizeable private-sector investment is today competing with global opportunities in any sector elsewhere. This means that, all things being equal, the group of economically feasible users is smaller as far as private-capital investment is concerned. (On the other hand, public investment directed to general economic development is content with a lower direct rate of return over a longer period in the expectation that additional significant benefits will be spread throughout the economy. This means lower tariffs and hence a larger potential group of economically feasible users.)

Second, private capital may be drying up, especially for larger projects. The flotation in autumn 1995 of the Indonesian operator, Telkom, rang alarm bells for many. Because of a poor response, the government was forced at the last minute to scale down by more than half its international placement and to reduce prices below their own indicative price range. Instead of there being the anticipated boost to the Jakarta Stock Exchange, the market index actually fell. It attracted only 1.59 billion USD against an expected yield of 2.5–3.1 billion USD. A *Financial Times* publication (APTA 1995b) commented that the international placement was complicated by the oversupply of telecoms issues from so many governments seeking to privatize their national operators. This problem seems set to continue well into the future. A recent survey revealed a queue of 51 forthcoming privatizations worldwide: 11 in Europe; 8 in Eastern Europe and former Soviet Union; 11 in the Middle East and Africa; 9 in Latin America; and 12 in the Asia–Pacific region (Salomon Brothers 1995). Analysts believe that the Korean Telecom (KT), Videsh Sanchar Nigam Ltd (VSNL), and Mahanagar Telephone Nigam Ltd privatization programs may be casualties. Indonesia itself has signaled an about turn in its privatization plans (APTA 1995c). A successful issue also depends on gauging the market, generating appropriate and accurate information, setting the right conditions, and preparing the right regulatory regime. Recent experience attests to this in India, where there are now major legal battles in the Supreme Court over procedures under which local licences were tendered and where a regulator is not yet even in place (Ingelbrecht 1996), and in Pakistan, where the issue in 1994 was marred by an admission that an error in the offer document had significantly overstated its worth. The current Pakistan offer is also facing great uncertainty (APTA 1995c).

Finally, extensive recent research suggests that privatization is successful only in the presence of certain political factors: specifically, a cohesive group of policymakers and the insulation of the state from major civil-society interest (Petrazzini 1995). It cannot be said that both factors obtain in South Africa.

### **What can be achieved with capital investment**

What can a given level of capital investment contribute to the achievement of universal service? A number of factors come into play.

#### *Investment focus*

Attention was drawn above to how a competitive environment and (in a different way) privatized operators tend to focus investment on the most profitable areas. Although doing this may make customer numbers rise significantly in urban areas, this is likely to be accomplished at the expense of universal service in rural and remote areas and likely to introduce a bias against local line provision and in favour of international connections. Thus, a given amount of investment is less likely to benefit the aims of universal service; even government monopolies are not always directly guided by such aims.

Specific options will be explored later, but suffice it to note at this point that retaining the focus of investment on universal service in the case of competition or private monopoly requires regulation against the prevailing tendencies, whereas in the case of a public-sector monopoly it requires a firm policy priority (which inevitably competes with other policy requirements).

#### *Operator efficiency*

It is often claimed that private operators are more efficient and cost effective because state monopolies are burdened with practices, worker skill profiles, and support infrastructure that have built up over decades, but the same can be argued of private monopolies, such as (until very recently) in the Philippines. Of course, with privatization, operators inherit whatever prevailed under public ownership, including a set of agreements with trade unions. For this reason, private investors usually benefit from the implementation of corporatization and restructuring before privatization. (It should be pointed out that privatization is not the only reason for these — they can also be implemented during continuing public ownership.)

The need for public and political support for privatization has seen the creation of a number of schemes to incorporate employee-redundancy payments into the process. In Chile, for instance, the government offered 50% of a generous severance pay in advance, on condition that the workers used 80% of it to buy shares in the operator. Shares were in turn guaranteed not to fall below the amount of severance pay they would have been entitled to at retirement. A total of 6.4% of the shares were bought by 84% of the company's workers, who thereby had an incentive to retire (Barrera 1995).

Nevertheless, it is true that new, probably competing, operators have the advantage of directly hiring appropriately skilled staff and deploying leaner labour



and management systems and advanced supporting infrastructure. The question is whether existing operators can achieve the same results through significant investment in restructuring and, especially, in employees' skills. This is being achieved, with strong political commitment and the cooperation of labour unions, in countries such as Korea, which has seen rapid network expansion under a monopoly (Kim 1993). Performance can be improved by developing a more flexible corporate structure and more effective yardsticks to evaluate past performance; decentralizing decision making and financing; and devising forms of incentive regulation (Bauer 1995). Dividing a national monopoly into regional carriers can also yield a thoroughgoing reorganization that in the context of an injection of investment might result in significant efficiency gains, but it also raises an issue for universal service because a mechanism would have to be devised to ensure that cross-subsidization can take place between economically strong urbanized regions with relatively developed networks and weaker rural regions where networks are patchy.

The cost of deploying new lines is significantly affected by the cost of switching and transmission equipment, which in turn may be influenced by, for instance, protectionist policies for the local telecommunications industry or by credit and other terms of multilateral or bilateral development programs.

### *Innovation*

A further factor influencing the effectiveness of investment is the extent to which innovation can be harnessed to achieve the goals of universal service in the short and long term.

There is strong evidence that technological innovation will become increasingly important in reducing the cost of providing service in rural and remote areas. In some remote rural areas, satellite solutions using Inmarsat are even now more appropriate than radio or land lines (Wright 1995); very small aperture terminal (VSAT) technology has been used in innovative ways in Algeria and Indonesia to promote universal service (Tyler 1994); and other satellite options, such as low Earth-orbiting satellites, are imminent. The explosive growth of cellular phones in urban areas has increased investment and interest in the technology, and fixed wireless may soon offer low-cost solutions for rural situations. Fixed wireless in poorer zones surrounding wealthy urban areas may also benefit from effective cross-subsidization, derived from piggy-backing on the existing system (Weterveld 1994). Other transmission technologies with rural potential include point-to-point radio for the local loop, digital-loop carrier, allowing multiple customers unrestricted access over a single copper line, and short-haul microwave.

The issue here is not the specific technologies — these will continue to evolve and multiply for some time — but rather how to create a regulatory and economic framework to allow such innovative solutions to be tested and to proliferate. A major report on this question (Tyler 1994), prepared for the International Telecommunications Union (ITU), concluded that the potential of innovation to forward universal service can be realized in a number of ways, including the following:

- Encouraging multiple new entrants, such as public telecommunication operators and VSAT satellite operators, each offering different solutions;
- Licencing local enterprises and municipal and cooperative ventures;
- Licencing and encouraging a single operational entity, created, at least in part, for the purpose of generating innovative solutions; and
- Retaining a monopoly operator but creating specific incentives.

The ITU report (Tyler 1994) outlines general approaches of regulators, from strongly proactive ones, deploying many of the above directly, to the *laissez faire*, essentially creating the conditions for competition.

General programs have also been launched to support innovation for specific social groups or regions. The EU launched the STAR Programme and Telematique Programme during the late 1980s, spending more than 1.5 billion USD on innovative networks, services, and applications for the less-developed regions of Europe (Ó Siochrú 1993); and the EU's current Telematics Programme and Advanced Communication Technologies and Services Programme promote innovation in all member states. Many developed countries have also directly supported broadband and other advanced technology trials aimed at improving rural access to citizens' services and to small business activity.

It is clear that what is needed is encouragement not simply for technical innovation, but also for institutional innovation. Morris and Stavrou (1993) suggested a combination of technological and institutional innovation for rural public telephones in South Africa to ensure access and reduce costs and vandalism. Rural telephone cooperatives played a major role in the extension of the telephone network in the United States during the 1930s. Creating an institutional and economic space for the rural entrepreneur or collective to provide services requires significant innovative thinking and support. A role for virtual-telephony

systems, based on voice mailboxes for leaving messages for people often a day's walk from a phone, is also being explored in South Africa.

The large migrant population in South Africa also lends itself to institutional innovation: for instance, migrant workers from the same area could be allowed to support the provision of a local phone near their homes; the service provider should consider the income of both urban and rural family users when assessing the feasibility of a rural line.

### **The scope for tariff flexibility**

Finally, even if all profits are reinvested, universal service is not necessarily best served through maximizing of profits for this purpose. A delicate and complex balance must be struck between investing in new user lines and maintaining tariffs at a level that users can afford. There is in turn the question of setting the level of tariffs for different services and setting the connection, rental, and usage fees.

Even in a completely unregulated and profit-oriented regime, achieving the optimal set of tariffs is problematic, given, for instance, the externality benefits of each additional user of the network and the difficulty of allocating costs accurately among different services. Where the regulatory regime is attempting to balance a range of priorities, including radical tariff adjustments, fair competition, and universal service, the regulatory mechanisms become both more complex and more uncertain in their outcome. The Office of Telecommunications in the United Kingdom is one of the most experienced and advanced in this, but even there, with a basic level of universal service virtually secured long before liberalization, regulations are constantly being revised to deal with competing and evolving aims.

From this point of view, a regulator can more easily oversee the activities of a state monopoly, focusing directly on policy priorities and on formulating appropriate tariff policy, although this independence is sometimes subject to external constraints, such as the imposition of *de facto* tariffs by international callback services, even where they are nominally illegal. Drawbacks can also include less rigour in cost control and more mediated feedback of customer requirements and opinions, but the latter also means a greater capacity to focus on the needs of those with little market power.

## **Conclusion**

In sum, the parameters above, all critical empirical determinants of the growth of universal service, can be addressed by either monopoly (public or private) or competitive service providers. The means by which they are addressed varies, sometimes in complex ways, among different regimes. But an important point is

that their positive influence on universal service is determined far more by national characteristics and international factors than by the type of regime.

Certainly, the specific characteristics and constraints of a given country might mean that a public monopoly rather than competition (or any variation in between) might in principle be more appropriate, or vice versa. The final outcome may be far more influenced by how effectively these policies are devised and implemented than by which of them is chosen.

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## CHAPTER 3

# INSTRUMENTS, MEASURES, AND REQUIREMENTS FOR UNIVERSAL SERVICE

How in practical terms can universal service be supported by policy? This chapter presents a more detailed and complete inventory of the various instruments and possibilities discussed in previous chapters.

Figure 2 illustrates the general relationships among different sources of finance, points of decision, and instruments. The figure distinguishes where resources may be directly gathered; the bodies that determine the destination of that finance; and the instruments available to pursue universal service. There are, of course, many complex relationships of exclusion and complementarity among these three and within them that the figure can make little attempt to illustrate without sacrificing even minimal clarity. The aim is simply to draw attention to broad relationships.

Sources of finance for universal service can broadly be divided into those that originate from within the telecommunications sector and those that are attracted there from outside. However, the investment goals of such finance (and especially whether it is devoted to network extension and affordability) will be determined by a number of different actors, and each source imposes certain constraints as well. Some fund-raising mechanisms by nature direct investment to very specific universal-service instruments and ends. Others are unconditional: the proceeds can be invested anywhere, even outside the telecommunications sector. Indeed, much of the investment raised within the sector will alone contribute nothing to universal service but will be drained from the sector.

Other mechanisms simply involve internal transfers and cross-subsidies in which the instrument and destination are inseparable. Special attention might also be given to the role of innovation as a dynamic factor that affects all other factors in universal service.

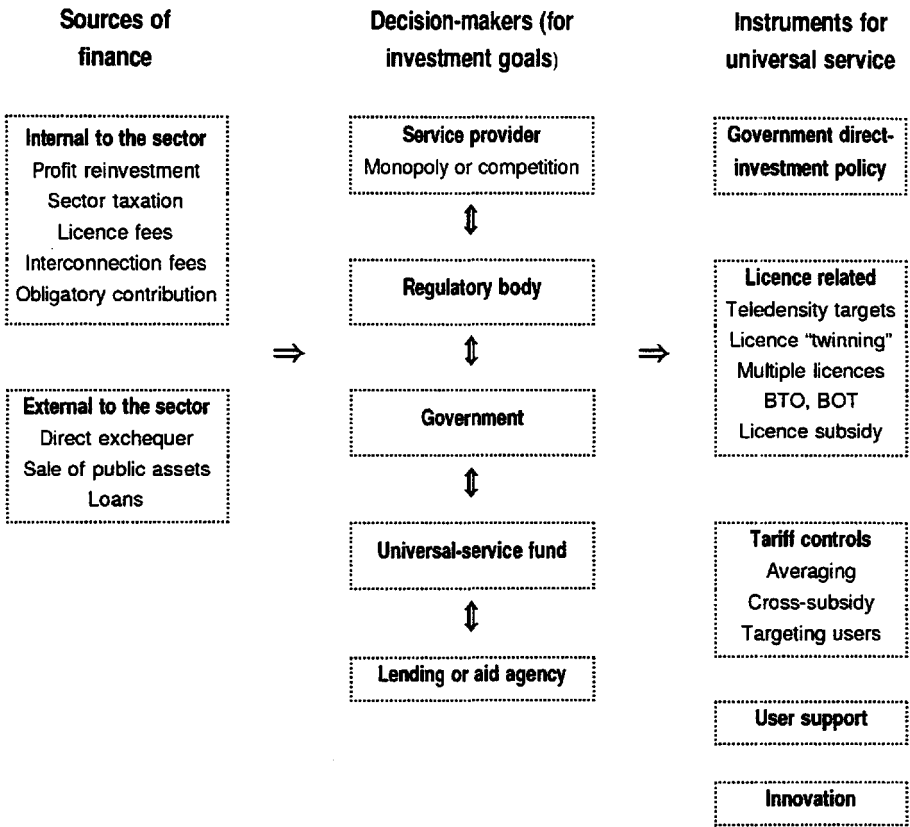


Figure 2. General relationship between finance, control, and instruments. Note: BTO, build-operate-transfer; BTO, build-transfer-operate.

The following explores these categories in some depth. The sources of finance are outlined first, along with the constraints, key actors, and factors that determine whether proceeds will go to universal service. In considering in turn the categories in Figure 2, some repetition of earlier sections will be unavoidable. Country examples will be given in more detail in the profiles in Chapter 5.

### Sources of finance and investment control

#### Sector-internal sources

##### *Profit reinvestment*

Telecommunications is virtually everywhere a profitable business (or at least potentially). The most common means of financing universal service is reinvested

profits. Generally, deciding whether to reinvest profits (and where) or to distribute them will rest ultimately with the owner, whether private or public.

The amount of net profits for investment in universal service will depend on the amount taken out. Governments, as owners of monopoly providers, often extract dividends for the general exchequer, and there are often significant debts to be paid. The commercialization of publicly owned operators generally means that operators gain more say in whether profits are distributed or reinvested and especially in the focus for investment. The threat of competition (whether at some specified date in the future or as a general possibility) will tend to direct investment away from universal-service needs and toward areas in which there is most likely to be competition.

Privatized operators, on the other hand, are generally less burdened with debts, but dividend payments to shareholders are rising and can sometimes consume virtually the entire profit. Liberalized regimes are also less likely to invest in universal service per se and more likely to invest in profit maximization (in the case of privatized monopolies) and in areas of competitive pressure (in the case of competition). Although these types of investment increase penetration, they might not do so according to the broader principles of universal service that focus on development.

Tariff cross-subsidies, when they are aimed at enhancing universal service and not at maximizing revenues, are in a sense a form of profit reinvestment, but the profits are foregone. (Cross-subsidy is considered below in "Mechanisms for Universal Service.")

#### *Telecommunications-sector taxation*

A number of tax systems have been devised by governments to gather additional revenue from users and operators in the telecommunications sector. In principle, the destination of tax revenues will be determined by government, but methods have been developed to ensure that revenues are reinvested in universal service and the development aims of the sector.

A development tax on all users, as a percentage of the regular bill, can be imposed; this is being considered, for instance, in Kenya. There is then, of course, the problem of ensuring that funds raised in this way will in fact be dedicated to universal service and development needs (Muigua 1994). To the user, this is in effect simply an increase in tariffs, with the prospect of only a very generalized benefit in the form of increased calling opportunities in the future (unlike the bonds mentioned in the previous chapter, which give potential subscribers specific benefits).



A turnover tax on service suppliers has been imposed, for instance, in Peru, which is a relatively liberalized context. The amount, 1% of turnover, is imposed on firms supplying communications services, including basic service, value-added services, and even cable television (CATV). The problem of ensuring that the funds collected will reach their intended destination (in this case, rural network extension and other areas of priority concern) is addressed by setting up a specific fund, Fondo de Inversión en Telecomunicaciones (FITEL, telecommunications investment fund), legally dedicated to the purpose.

#### *Licence fees*

Although governments occasionally collect licence fees from their own monopoly providers, licence fees come to the fore when private operators are offered licences in areas of large unmet demand and great growth potential. These licencees (often consortia of local and international firms) may be offered an exclusive monopoly in totally unserved areas, may be competing with an existing monopoly in poorly served areas, or may be facing several competitors but in very lucrative markets, such as international telephony or mobile services. (A licence fee may also constitute an element in a privatization package.)

In large underdeveloped markets, huge sums can be raised through licences. The current issue of licences for basic and mobile services in India will yield the government tens of billions of dollars, although it is experiencing great difficulties in completing the process.

However, licence fees are ultimately passed on to customers in tariffs, and they are thus usually accompanied by tariff regulations (see below) to ensure that universal-service goals are addressed, as in India. There is thus necessarily a trade-off between high fees and affordable tariffs. In India, some claim that the balance struck will be to the detriment of universal service.

High fees can be used to extend the network and services to areas beyond the reach of competitive new licence holders or may be redirected to general government expenditure, on the basis that the government is disposing of a general asset (as happened in the United Kingdom with both licence fees and privatization receipts and will probably happen to much of the fee yield in India).

#### *Interconnection fees*

Liberalization creates the need for network interconnection, that is, for various service providers to have access to the networks of others. Usually, the dominant network provider will be required to make the network available to other service suppliers at a tariff closely related to cost.

At the same time, the dominant operator (and possibly others) can be obliged to fulfil universal-service obligations pertaining to network extension and tariffs. Adjusting the interconnection fee is a means of collecting the money to cover the cost of such obligations.

This operation is complex, and there are several ways to calibrate the system, each with its own effect on competitive forces and on universal service. This system is currently used in the United Kingdom but will be replaced with contributions to a universal-service fund in 1997. In the United States, a variation on interconnection fees is used to ensure transfers from long-distance carriers to local-access networks.

#### *Obligatory contributions (universal-service fund)*

Taking advantage of the suppliers' need to interconnect services, a regulatory authority can collect interconnection fees to help finance universal service, or it can choose simply to impose obligatory contributions from operators (or only the dominant operator). The amount and distribution of these are determined by a number of possible formulae. These contributions are in turn usually directed to a universal-service fund, which is thus not a mechanism for raising finance per se but rather a clearing house for funds raised by other means. (Universal-service funds are sometimes used freely to raise finance from several of the sources outlined in this section, and the regulatory authorities can redirect them with various degrees of flexibility, using a variety of mechanisms.)

Such obligatory contributions, coupled with a universal-service fund, are the favoured option of the EU in the context of imminent liberalization, and such funds exist in many parts of the world, including Peru, Hungary, and Chile. These funds are usually relatively free from government control, being either directed by the regulator or directed by an independent though government-appointed body.

#### **Sector-external sources**

Often there is a pressing need for finance from outside the telecommunications sector, especially where the need for network growth is huge. Again, issues have already been outlined. There are basically three ways to raise finance externally: direct government investment; loans and development assistance; and privatization.

#### *Direct government investment*

Government finance is scarce in a development context but can be directed specifically to universal service and long-term development. Usually, the vibrancy of the general economy, the extent of pent-up economically feasible demand, the

government's recognition of the benefits of telecommunications, and the pressures of competing investment needs will be among factors that influence a government in directing investment. Special mechanisms can be set up to raise funds. For instance, bond issues for those on a waiting list (as used in Japan, Korea, and elsewhere) can be used to raise finance from outside the sector because they attract some general investors seeking the guaranteed rate of return

#### *Loans and development assistance*

International loans from regional banks and the World Bank and bilateral and multilateral aid are often conditional on focusing investment on only the more lucrative sectors (at the expense of universal service) and on liberalizing the sector. In monopolies, sector restructuring and commercialization are usually prerequisites for loan agencies, and direct loans to operators may be even more stringently linked to commercial priorities and the payback periods. Together, these factors can severely constrain the extent to which governments and national operators can direct loans to universal-service and national-development priorities.

#### *Privatization*

Privatization is the sale of public operators through share issues or direct capital injections. Although this has been effective as a once-off means to raise finance, globally the level of finance is diminishing relative to demand (as shown by the Indonesian privatization). Sale under pressure can also lead to less than optimal results in terms of raising funds and focusing on universal service (for instance, in much of Central and Eastern Europe, the Caribbean, Pakistan, and Sudan).

Share flotations can be very hazardous undertakings with uncertain outcomes. Getting to the point of sale often proves impossible or is a protracted process. Although direct sale to external operators reduces uncertainties, the shares are often undervalued. The sale of a controlling interest renders it necessary to impose universal-service goals by regulatory means or licences, rather than directly by internal operator transfers, but anything less than a controlling share is relatively unattractive for most investors, especially in least-developed networks.

### **Instruments for universal service**

A variety of instruments have been used to support the different elements of universal service. Commonly, network extension is assured through a government policy to directly invest in it as part of a general modernization of development strategy. Mechanisms to ensure universal service are associated with the issue of licences to provide services, especially in the context of privatization and competition. Various options for these will be outlined. Tariffs controls, a mainstay of

most universal-service policies no matter what the regime, greatly influence not just affordability but also network extension.

Technological, regulatory, and institutional innovations (the potential of which, as we have seen, is growing strongly in the context of universal service) and a number of other possibilities will be explored. This will be followed by a look at support instruments for the final user, aimed at more effective use of telecommunications services and going beyond what is traditionally regarded as the ambit of universal-service provision and anticipating the Information Society.

### **Direct government investment**

Government-owned monopolies and operators are subject to various degrees of government control in their investment priorities. When the operator is part of a government department, which was until a decade or two ago the most common model, control is total. However, the trend toward corporatization of structures and commercialization of operations has led to the development of specific universal-service goals relating to network extension, agreed to by operators (who remain relatively autonomous in day-to-day commercial affairs) and often specified in contracts for a given period.

In these contexts, universal service in the form of network extension has been pursued by direct government investment or through the provision of loan guarantees. This instrument has been remarkably successful in increasing overall penetration and in improving universal service; it was employed in early stages in the most developed countries of Europe, Australia, and elsewhere but has also been used more recently in rapidly expanding economies, such as Korea, China, Indonesia, Taiwan, and Singapore.

The conditions for this instrument's success seem to have been a rapidly expanding economy leading to significant unmet economically feasible demand and the availability of appropriate domestic or external sources of capital.

Network extension into areas most relevant to universal service, that is, where revenues generated may not in the short term cover costs, is always balanced in such circumstances by providing high-grade and advanced services to the business sector and urban areas, which generates significant revenue in a short time. Approaches to this and the complex trade-offs with tariffs and other factors are numerous.

### **Licence conditions**

The use of licence conditions to achieve universal service is increasingly the norm, even in public monopolies as they gradually commercialize and their relationship to government and national economic objectives becomes more explicit and

formalized. The variety of approaches is increasing as different countries experiment in the context of liberalization policies.

*Requiring network extension with a licence zone*

During privatization (or in cases where operators were always private) or the introduction of competition, the most frequently used instrument is to ensure network extension as a condition for obtaining a licence for a given zone (nationally or for a region) or service. In most developing countries, including Mexico, Peru, Argentina, and India, the licence conditions oblige the operators, whether in competitive or monopoly supply, to expand the network according to specified parameters. These obligations can include the following:

- Increasing the overall teledensity within the zone to an absolute level of lines or a cumulative percentage within a given period;
- Supplying a number of public phones in a certain proportion to the number of private lines;
- Improving the quality of services provided, including noise–signal ratio and percentage of completed calls;
- Decreasing the waiting time for telephones and the size of the waiting list; and
- Supplying services (perhaps only a single line) to towns and villages of less than a certain size.

Within an area, such licence conditions ensure the concurrent growth of access for noncommercial and commercial users and are also usually combined with tariffs controls. As always, the ultimate limit is set by the size and value of the commercial segment. Various means are used to ensure that such targets are met, including escrow accounts (that is, funds retained by a third party until specified conditions are met), regular review points, and so forth. Splitting the country into several licence zones (which is done in most larger countries, such as India and the Philippines) can also help tap additional sources of funding from smaller investors inside and outside the industry. This approach allows the hedging of bets and permits experimentation. However, the zones must contain both attractive and less attractive subareas to ensure that all licences are taken up.

*Twining of lucrative and nonlucrative licences*

One of the most innovative licence conditions has been developed in the Philippines. The government bought back the privately owned monopoly operator in preparation for issuing licences in a number of regions, more and less lucrative, into which it divided the country. Applicants for the lucrative international-service and mobile-service licences in developed regions had to agree to take a licence in the poorer, more remote rural areas and put in an agreed number of new local lines (as many as 400 000 per licence) there. Using these means, the government plans to increase teledensity from 2.1% (that is, 2.1 lines for every 100 people) in 1995 to 8.4% by 2000. Extension of universal service in this manner reflects the highly polarized nature of Philippine society regionally (somewhat like South Africa) and the existence of a much suppressed demand in certain regions under the privatized monopoly.

*Issuing multiple licences*

Issuing competing licences for similar transmission and switching technologies in the same region is the usual route to liberalization in mature markets. It can, of course, lead to significant investment in network extension, although most investment goes to developing parallel networks, rather than to extending the network to new potential users. Benefits to consumers are usually seen in tariff competition and service innovation. However, there are other ways to use multiple licences to further network extension.

*Splitting basic-service licences*

Noncompeting basic-service licences can be issued in a given region after the network is split into local, national, and international segments. This opens the possibility of using alternative networks (developed, for instance, by the railways or the army) to extend services, devolve local network development, and permit various possibilities for cross-subsidies based on licences. Many countries have taken this route. Columbia, for example, will in 1997 open both long-distance and international markets to competition while retaining government ownership of the current long-distance (and local) monopoly. However, as long-distance and international services are the most profitable, the government, like others before it, faces the task of instituting an effective regulatory regime to ensure that universal service at the local level will not lose out; that is, it must devise means to divert revenues from all long-distance and international service to local access.

A possible advantage of this over other approaches is that local networks might tap new local investment sources (including business, government, and the public), and national and international networks can attract the more usual finance

mechanisms. Local network corporations can also relate more closely to real needs. Beyond the local level, licences can be competitive or monopoly based. Examples of this can be found in Central and Eastern Europe, and this approach served to expand universal service in Finland.

#### *Issuing licences for additional nontelecommunications services*

An approach that will become increasingly common is issuing telecommunications licences to transmission systems that previously carried different services. Some countries, including certain European countries and the United States, have significant potential for introducing competition from CATV suppliers. Although the effect in these countries will mainly be on tariffs and services, the possibility of combining telephone services with a wider range of services, including television and radio, may increase the feasibility of adding certain customer segments in developing countries where entirely new networks are being set up.

#### *Sharing revenue as an investment incentive*

To rapidly expand their networks in areas where they are very poor, Malaysia chose the BOT scheme and Thailand chose the BTO scheme. A private operator (perhaps a foreign or local consortium) builds the network with its own funds, sooner or later passing ownership to the government and getting a return on its investment through sharing revenue with the government for a set period that is often linked to an exclusive licence. Although one advantage of such schemes is that control eventually reverts to government, effective control for a significant period must be with the investor because the main attraction is a steady stream of income. Licence conditions must also carefully balance the network extension and tariff sides of universal service.

#### *Lowest-subsidy licence auction*

An option pursued very recently in Peru and funded through FITEL (the universal-service fund) was to call a competitive tender for licences in noncommercial areas, with the winner being the bidder seeking the lowest subsidy. In addition, the basic-service licence was split because it was restricted to supplying villages with fewer than 500 inhabitants. The main operator is obliged to supply service to larger towns. Licence applications were to be assessed during January of 1996.

#### **Tariff policies and controls**

Tariff policies can be effected through a range of options:

- Direct tariff control over providers;

- Licence fees and conditions;
- Regulation of competition;
- Voluntary activity by operators, whether competing or monopoly;
- Telecommunications-sector taxation and expenditure; and
- General exchequer funding.

Tariff policy is more suitable than, for instance, licence conditions for addressing an evolving situation and for fine tuning. Tariff averaging and cross-subsidization are the most extensively used mechanisms, and these will be summarized below (however, because they are intertwined and complex, a more extensive account is given in Appendix B). Methods of targeting specific groups of users will also be discussed below.

### *Tariff averaging*

Tariff averaging is used virtually everywhere to reduce tariff variations to a small number of tariff bands. Averaging is applied to connection charges, periodic rental fees, and usage tariffs. It is most commonly discussed as an instrument for cross-subsidization, but it need not be used for this. In fact, tariff averaging is applied to rental and call fees even in the most competitive markets.

Averaging, on its own, tends to favour rural over urban areas, especially for connection fees. Rapidly falling maintenance and operation (usage) costs overall mean that the marginal cost for all users is both falling and converging, affecting the cost basis of rentals and usage. In theory, this should reduce the benefits and losses of averaging to any particular group, but the existing small number of rental and usage tariff bands means that low-volume users currently tend to benefit the most. As a mechanism for universal service, averaging per se does not discriminate between different groups of users, but there is a general though not necessarily extreme bias toward high-cost users, such as rural and low-usage groups.

### *Cross-subsidization*

As a mechanism for cross-subsidization, averaging comes into its own. There are basically three forms of cross-subsidization: within tariff elements; between tariff elements; and between basic and advanced services. Each form has distinct and often complex effects.

**CROSS-SUBSIDIZATION WITHIN TARIFF ELEMENTS (SPECIFICALLY, WITHIN CONNECTION CHARGES, RENTAL FEES, AND USAGE TARIFFS)** — Tariff averaging is very often used as a mechanism to effect the cross-subsidy of customers. For instance, many



countries have a single national connection charge, one or two rental rates, and at most a few usage tariffs. Such a restricted number of tariffs (that is, extreme averaging) implies considerable cross-subsidy between customers in each tariff. The effects historically, but by no means everywhere, have been to subsidize the following:

- Connection cost for customers in rural areas;
- Rentals for low-volume, mainly domestic, users (although there is a countervailing tendency here) and high-maintenance rural users; and
- Local calls, favouring domestic users and small, local businesses.

Within these broad parameters, the effects are indiscriminate.

CROSS-SUBSIDIZATION BETWEEN TARIFF ELEMENTS (SPECIFICALLY, BETWEEN USAGE TARIFFS AND CONNECTION AND RENTAL FEES) — Again, historically, but for reasons that still obtain in many countries, the tendency is for usage tariffs to be used to cross-subsidize connection and rental fees. However, the costs of the different elements are difficult to disentangle, and the supply and demand economics are intertwined, discouraging overgeneralization. This type of cross-subsidization both favours network expansion over more intensive usage and encourages the retention of low-usage customers, in both cases reinforcing universal service.

CROSS-SUBSIDIZATION BETWEEN ADVANCED AND BASIC SERVICES — The final type of cross-subsidization occurs between different types of services, specifically between advanced services (such as leased lines, mobile services, and value-added services) and basic telephony. The experience here is complex and difficult to determine. In some cases, advanced services have been premium priced and have in effect subsidized basic services. However, the general trend may be in an opposite direction. Because advanced services are more recent, they tend to be introduced in a more liberalized environment. Where monopolies have been maintained on basic services (and even in cases of competition), basic services can be used to cross-subsidize more advanced services to make the latter more competitive in the lucrative and growing advanced-services market. The general trend in cross-subsidy between basic and advanced services may thus be damaging to universal service and may favour larger business users.

Cross-subsidies in general are being reduced as competition and liberalization policies force prices toward their underlying costs. However, the greater

emphasis that service providers are placing on growing and more lucrative markets could easily push this tendency so far that the effects run counter to the traditional effects of cross-subsidization. Thus, with tariff rebalancing, safeguards may be necessary to ensure not only that the traditional bias in favour of rural and small users is maintained, but also that a bias against these users is not created.

*Reduced tariffs and targeted-user support*

Targeted tariffs are tariff reductions for specific, often very narrow, user groups. These targeted tariffs are usually implemented explicitly as part of universal-service policy. Many have been devised, including the following:

- Lower connection, rental, and usage tariffs for low-income groups and vulnerable groups, such as older people, for standard usage terms;
- Limited service provision, such as receive-only or emergency-call-only telephony for low-income and vulnerable groups (outgoing calls might be allowed only with advance payment to a special account or with charge cards);
- Low usage rates for a select set of destination users, such as low rates for migrants to phone family members; and
- Usage support for certain groups that face specific and costly obstacles to use, such as people with sensory or mobility disabilities.

The tariff rate is not the only significant factor affecting affordability — the means and terms of payment can also be important:

- Should payment be in advance, in arrears, or in instalments?
- How great is people's fear of debt (which is related to the security of income)?
- To what extent does the service offer a means for users to monitor and control costs?

Targeted tariffs have the benefit of being highly discriminating, offering support to targeted groups relating to their specific needs. However, some of these schemes require means testing or eligibility testing. Means testing, for instance,

can reinforce tendencies toward a two-tier society (Cordell 1996). In general, tariff targeting is more relevant where universal service is close to being achieved, and it allows a fine tuning of service provision. As well as being imposed by a regulator, tariff targeting can be implemented voluntarily by operators, even in competition (such as by British Telecommunications plc in the United Kingdom). This instrument is also being used in EU policy to selectively compensate certain groups for some negative effects of liberalization.

### **Innovation**

Innovation deserves specific mention because it can influence all parameters of universal service. The primary goal is to create an environment that attracts or stimulates innovation in technology, organizations, services, and usage and ensures that when innovation appears, it can be diffused quickly. As already mentioned, an appropriate regulatory structure can be developed in either monopoly or competitive industry structures, although clearly not all the mechanisms suggested below can be implemented in each.

Examples of such innovation, as mentioned earlier, are various fixed cellular, radio, and satellite technologies for rural areas. The new cost structures of such services also give rise to the possibility of innovations in tariffs, such as eliminating connection and usage charges for communal-use phones or heavily weighing certain elements over others. Beirut, for instance, where the fixed network was severely damaged, has rapidly introduced cellular service as a replacement while the wired network is being reconstructed. Two suppliers were licenced but with a strict regime that limits the tariff for local calls to 0.05 USD per minute. Although there are connection fees of 500 USD and monthly rental fees of 25 USD, users take advantage of credit schemes for these fees and have clearly in some instances banded together to cover them. The resulting explosive growth to about 100 000 users has forced the regulator to insist that the operators sign up no new users until they can handle the traffic. The regulator also gets 20% of revenue, which can go toward the development of the wired network (Pyramid Research, Inc. — Africa Middle East 1995).

Peru has also benefited from innovation in institutional delivery of services. The Red Científica Peruana (RCP, Peruvian academic network) is a nonprofit Internet provider that had grown from 171 local nodes to 1 200 by October 1995. Only 5% of the users, mainly nongovernmental organizations (NGOs) and academic institutions, pay for the service; the rest receive it for free. The promoters see this mechanism as a tool for development and encourage small firms to use it as a marketing device; the government is planning to use it to disseminate information on elections.

Among mechanisms that have been deployed around the world to enhance innovation are the following.

#### *Selective licencing*

Licence conditions can deliberately favour innovation as a condition of issue; examples are pioneer's preference in the United States and a preference for the innovative use of cellular in Germany. The failure of the Telepoint/Phonepoint scheme in the United Kingdom highlights the dangers of this approach.

#### *Regulation of network interconnection*

In a (partially) liberalized environment, regulation of network interconnection should ensure that unbundling of services is possible, to allow selective use for innovative suppliers. The point here is that innovative service technologies might require the use of only one limited-transmission element, so those who use it should not be forced to pay for a more inclusive set of services.

#### *Tariff flexibility*

Pricing flexibility can quickly diffuse technical innovation, whereas inflexibility can inhibit it (as in Australia, France, Canada, Mexico, Kenya, etc.). Rigid licence conditions concerning tariffs foster inertia if they are linked to the repayment of private-sector investment. On the other hand, those imposing tariff control on a public monopoly must recognize the potential of innovative approaches and respond accordingly.

#### *Organizational reengineering*

Many operators, responding to accumulated technical change, internal organizational inertia, and, in some cases, the introduction of competition, have comprehensively rethought their organizations, sometimes referred to as business-process reengineering. Although expanding markets and service innovation can result in reduced employment, their final result can also be greater job security.

#### *Responsive use of the radio spectrum*

The radio spectrum should be used to respond to possibilities opened up by new technologies, especially for wireless network extension to rural areas where a number of options — cellular, fixed radio, microwave — are being explored. Most developed countries have had to respond quickly to cellular, but the challenges may be different in rural areas.

*Flexible, stable standardization*

Standards can either offer a secure technical environment or inhibit innovation through rigidity (as seen in the United States and other developed countries).

*Support for research and development and innovation*

Licence conditions demanding certain levels of research and development (R&D), as implemented in France, can encourage innovative R&D in local telecommunications suppliers also involved in the industry. A secure intellectual-property law also encourages innovation in R&D, although countries without such capacities will end up paying the royalties. Attention was drawn earlier to considerable EU funding to develop innovative services in less-developed regions through grants to local initiatives proposed by various consortia.

**Final-user support for effective use**

As already mentioned, the Information Society in particular raises the issue of including user support as an element of universal service (see Appendix C). Without such support, the services may be accessible but the benefits unrealized because of a lack of user awareness, training, and so on. This would considerably weaken the long-term feasibility of such service provision, especially for more advanced uses of basic services. A huge range of actions can be envisaged here, tailored to the specific needs of the area in question. A central aspect of such support is the direct participation of users and potential users. Experience in other countries has shown that top-down approaches suffer much higher failure rates because such support must relate to a diversity of realities, needs, and constraints of users (Ó Siochrú et al. 1995). Examples of actions to support users include the following.

*Telecentres*

Telecentres group together under a single roof a number of facilities, including telephony, fax, training, and perhaps e-mail and Internet access. Telebrás of Brazil has piloted an ambitious telecentre project. Pilot centres offering a full range of services were completed by the end of 1994. So far they have been situated in larger towns (Qvortrup 1994). Vietnam has also just agreed to undertake a similar project.<sup>1</sup> The EU's STAR Programme also supported a number of such centres in peripheral and rural parts of Europe, and the Korean government is opening subsidized regional information centres that offer telematics services in rural areas.

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<sup>1</sup> Lars Engvall, personal communication, 1996.

*Computer literacy and training programs*

Also in Korea, under the ambitious Korean Information Infrastructure (KII) program, the government is providing free computer-education classes in remote and rural regions in a concerted effort to remove specific local barriers to the use of computers and telecommunications.

In Ireland, an EU-funded project has been set up to train trainers, who will in turn train people in disadvantaged groups and communities to use the Internet and other advanced services. This is seen as an issue of empowerment in the context of the Information Society.

*Direct support for social and telehealth services*

Many developed countries and some developing countries, such as Korea and Peru, are bringing telehealth, remote access to public services, and other social services to rural and less-developed regions.

*Electronic networking for NGO and local business development*

A number of pilot projects have sprung up electronically linking local NGOs and producer cooperatives to outside markets in an attempt to capture more of the economic value in rural and often remote regions. Such programs involve training and equipment support as parts of broader development packages (Brown 1993). In Peru, a nonprofit venture providing Internet access to small firms and NGOs has proven very popular and is expected to yield economic benefits before long.

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## CHAPTER 4

# THE UNIVERSAL SERVICE AGENCY: SOME CONCLUSIONS

The creation of the proposed Universal Service Agency in South Africa (distinct from a regulatory agency) raises a whole host of questions about the scope and activities of such an agency, the ways it would relate to regulation and to policy formation, and so forth. This report cannot offer answers to these questions: answers will be forthcoming only from an in-depth consideration of the situation in South Africa. Perhaps, though, this report can offer some useful ideas, data, and information from around the world that will be of some use in that intensive process. At this stage, a few general conclusions can be drawn that relate to the diverse demands the Universal Service Agency must address and avenues worth exploring to meet the challenge.

### **Diverse demands**

The regulatory regime and policy in general in South Africa will certainly have to cope with pressures coming from a number of directions, imposing a variety of often antagonistic demands.

### **The early indirect impact of liberalization**

Along with regulating for the existing levels of competition and liberalization, the new structures will have to oversee the gradual deepening and widening of these. Although full competition in local services and networks may not come in the foreseeable future, if at all, the impact on investment patterns and especially tariffs will be felt much earlier.

In general, falling tariffs in many countries exert economic pressure on all countries to follow suit and affect both the decisions of footloose branch plants to relocate industry around the world and the efforts of local industry, with large



distant markets, to keep costs down. More important, call-back services can dramatically affect international call tariffs, with significant knock-on effects on domestic rates. Furthermore, the anticipation of competition, even though it may be many years down the road, can significantly colour the investment decisions of operators, steering investment toward those services and regions in which competition is expected in the future and, as is seen currently in the weaker regions of Europe, away from universal-service priorities.

Essentially, whatever policy and regulatory structures are put in place now should be durable and robust enough to last well into the future. The Universal Service Agency will have to anticipate the effects of liberalization long before they arrive.

### **An opportunity to promote universal service**

As a result of South Africa's historical circumstances, both the social and the economic aspects of universal service must be emphasized. The "legitimacy" of previous inequities has suddenly been undermined, exposing a huge, unacceptable gap in telecommunications for social and economic needs. This is already acknowledged, and there is no disagreement about the priority of universal service.

It might seem that all countries that have large rural populations and face a development challenge would arrive at the same conclusion. In fact, for various political and economic reasons, this is not so, and there are few parallel cases where universal service features so prominently (Korea is one notably successful one). For instance, the specific circumstances of the changes in Central and Eastern European countries and the former Soviet Union pushed the needs of large industry to the foreground, and universal service must now wait. Similarly, many developing countries, under pressure from the World Bank, the World Trade Organization, and others, have had to prioritize the liberalization process over universal service.

An emphasis on universal service is thus an opportunity to support a specifically South African development trajectory that, if successful, will also be of great relevance elsewhere.

### **Managing tensions between universal service and sector growth under liberalization**

The development circumstances of South Africa give rise to especially marked tensions between regulating for competition, which must simulate and safeguard competitive forces, and regulating for universal service, which must counter some of the effects of competition. In some countries, such as the United Kingdom, the issue is far less pronounced because universal service has been virtually achieved

and only fine tuning is required. Some developing countries have also more integrated and cohesive economies and societies as points of departure.

The tension is especially pronounced in the opposing aims of maximizing profits and absolute user numbers and maximizing the long-term economic and social development in South Africa. The difference is crucial, especially in telecommunications, for at least two reasons.

First, with such a large rural population, a major national priority must be to encourage all kinds of local industry. Using telecommunications effectively is bound to become an important element in small businesses' addressing needs and markets beyond their rural localities, even more so than in urban areas. Yet in terms of conventional accounting and of competitive tariffs, the telecommunications operator (in monopoly or in competition) can capture in revenues only a fraction of total benefits accruing to these users, as a result of economic externalities and the geographical bias of benefits. What this means is that connecting up other users at lower cost (such as in urban areas), who would nevertheless derive less benefit from use, is more attractive to an operator, even though the overall national benefit is less.

Second, a wealth of experience confirms that the effective use of telecommunications in this way depends crucially on its integration into broader, multifaceted development programs. Such integration is extremely difficult for operators, especially competing operators but also monopolies, because of counter pressures created by their own business plans. Policy and the Universal Service Agency must create the institutional basis for this integration.

This leads into the question of the social use of telecommunications. Long-term development policy demands that education and health be emphasized to underpin long-term growth. Yet education and health tend not to send the usual (market-driven) signals to which a liberalized telecommunications industry can respond. There is thus a further need to ensure that these are accorded appropriate priority.

### **Anticipating the Information Society**

A further complicating factor on the horizon is the emergence of the Information Society (see Appendix C). With universal service for voice telephony, it may be safely assumed that once given affordable access, users themselves can get on with reaping the benefits — they know why they must use the phone and can easily develop strategies for economic or social gain. Such effective use cannot be taken for granted with the new wave of services that can be transmitted over normal phone lines, such as Internet access, EDI, and enhanced basic services (call forwarding, voice mail, etc.), and that may offer considerable development

potential. Using these new services to maximum effect requires a different level and nature of support (including training); access to more sophisticated equipment; and higher expenditures for the purchase, maintenance, and security of equipment. Providing affordable access will surely not be enough to achieve effective use.

In institutional terms, dealing with these factors and successfully navigating rapid evolution will require a complex and subtle relationship among government policy, regulation, universal service, and development.

### **Avenues to explore**

Although solutions are not found readily at hand, international experience tends to endorse the current overall direction of policy in South Africa.

#### **Untangling, distinguishing, and recombining the functions**

The regulatory roles sketched out above are nothing if not complex. Liberalization itself increases complexity, and the circumstances in South Africa magnify this considerably. Regulation must at once deflect, encourage, and stimulate competition in the interests of adjusting to a global liberalized environment while creating “alien” incentives to provide universal service for social and long-term development. Dealing with such complexity (as demanded by systems theory) requires a certain degree of complexity in institutional arrangements.

It is thus sensible to distinguish clearly between the two main forces at work: the need to respond to liberalization internationally and possibly introduce it nationally; and the need to simultaneously maintain a clear and unambiguous focus on universal service for social and long-term development. These needs require distinct approaches in terms of conceptualization, formulation, and, to some extent, implementation. Thus, the approach to meeting these needs will necessarily be threefold:

- Policy formation to reconcile at a high level the demands of the sector and the various operators and the demands of development and universal service;
- Regulation for sectoral growth and liberalization, under a regulatory agency; and
- Support for universal service and development through a diversity of actions and various inputs into the regulatory and policy domains, under the Universal Service Agency.

Such untangling of priorities will support a more coherent recombination within an overall strategic framework.

Different countries have tried various ways to implement this approach. For instance, in Peru, universal service falls within the remit of the regulator, the Organismo Supervisor de Inversión Privada en Telecomunicaciones (OSIPTTEL, “organism” supervising private investment in telecommunications). However, it was deemed necessary to introduce an autonomous section to manage and administer FITEL (the universal-service fund), the purpose of which is to develop rural universal service by a variety of means. Similarly, in Chile, a fund was set up when, under an extreme liberalization program, expansion of services to rural areas had ground to a halt. The fund exists quite separately from the regulator, is supported and overseen by the government, and awards finances to projects deemed worthy. In both countries, naturally, policy remains with government.

### **Integration with development policy**

Integrating universal service with strategies for development will require a number of intimate policy, institutional, and administrative links. Such links become even more difficult to establish and maintain as the number and variety of telecommunications service suppliers multiplies. Developing these links will require arrangements and actions that are dissimilar to those involved in regulation per se. The integration of policy and action could, of course, be undertaken by government directly, but this has a number of disadvantages, including possible bureaucratic obstacles and interdepartmental rivalries. Furthermore, government departments might not have the appropriate personnel and instruments to implement policy.

Thus, the Universal Service Agency will, in contrast to a regulatory agency, require a different overall approach, a distinct set of skills and expertise, and dedicated and unique instruments to implement strategy.

The EU recently recognized the need for strategy integration and is supporting the development of almost 30 regional-level strategies for integrating advanced services into broad-based strategic development plans; it is also funding a set of pilot projects. These are overseen by specialized offices, set up for this purpose and appropriately staffed and equipped.

### **Parallel and complementary information systems**

The commercial growth of telecommunications and its regulation, on the one hand, and universal service, on the other, require overlapping but quite different monitoring and information systems.

There would be a need to monitor progress toward the achievement of universal service (as distinct from simply increased teledensity). This would include monitoring of the following:

- Different social groups;
- Parameters of economic activity;
- Capacity to use services effectively; and
- Need for new services.

Assessing the impacts on universal service of cross-subsidy, tariff averaging, adherence to licence conditions, and other factors would also place quite a different emphasis on data requirements and even sources. There would be a need to directly sponsor research on the potential long-term impact of universal service, on the level of awareness in the population, on resistance to use, and so forth. Although a regulatory agency and the Universal Service Agency would each collect its own data, coordination between them would clearly be necessary.

### **Innovation in universal service**

The policies and instruments used to pursue universal service are diverse, and many different approaches are being tried. Although many of these policies and instruments are still in their infancy, the (potentially or actually) more successful ones have been innovative, breaking new ground, and they continue to be so. There is evidence also of a gradual evolution of ideas as countries assess the experience of others and adapt the options to their own environment.

Certainly, much more can be learned from other's experience as the dynamic of the telecommunications sector continues to unfold and evolve toward the Information Society and as desire to harness the benefits for balanced development grows. A strong case can be made for the systematic gathering of such experience and for communicating with other agencies and organizations pursuing similar objectives around the world as ways to enhance efforts in South Africa and elsewhere. Areas for exploring innovation in universal service might include the following:

- Institutional and organizational frameworks;
- Specific mechanisms and instruments and their success;
- Regulation to exploit new technological opportunities, to develop or attract such solutions, and to test and diffuse them; and

- The use of new technologies and ways to support more effective use.

Although organizations like the ITU have attempted to assess innovations and disseminate advice on them, the rapid pace of change and the great variety of sources and types of innovation make the task difficult. Results tend to remain too general to assist specific actions at the national level.

The Universal Service Agency would be well positioned both to gather and to further disseminate such innovations around the world. This process could begin through informal networking, attending conferences, and so forth and through the support of consultants. A promising idea that goes a step further might be to sponsor a large-scale, international conference specifically on this topic, perhaps working with intergovernmental or aid organizations. Not only would useful information be gathered, but the basis for a network for future contacts might be established. Although international conferences on telecommunications following the trail of liberalization have become commonplace around the world, virtually all of these conferences concentrate on opportunities created for international investors and operators and equipment and service providers. The conference suggested above would fill a significant gap by addressing the more fundamental issues in telecommunications and its potential contribution to economic and social development.

### **Initiatives beyond the communications domain**

The scope of universal-service actions, as traditionally exercised by regulatory agencies and governments, will be inadequate to cover a number of new needs arising in the context of the Information Society. The Universal Service Agency will thus be challenged to develop solutions outside the norm.

In most countries, including European countries, Korea, and Singapore, support programs for the Information Society have been initiated and run from outside the telecommunications sector, a clear recognition of the pervasive nature of the Information Society. The actions, skills, and expertise required diverge significantly from those traditionally found in the sector or among regulators. In some cases, these actions are undertaken by agencies responsible for planning, funding, and even executing pilot and targeted initiatives of this kind.

### **Mechanisms for transparency, accountability, and participation**

The enhanced developmental and social requirements of universal service, particularly in a society polarized both economically and socially, suggest a pressing need for transparency and accountability. Although regulation for sector growth and liberalization in principle demands transparency and accountability, it

can in practice require the collection and maintenance of commercially sensitive information; the negotiation and implementation of highly complex, arcane formulae for calculating contributions to universal service; and other licencing and regulatory activities. In practice, transparency is likely to be a reality to only a select few, with the demands of regulation instilling a cautious approach to public information.

The Universal Service Agency, on the other hand, must by its nature be open and transparent and allow participation by stakeholders. It should ensure that aspects of policy that go beyond narrow sectoral and competitive interests (which constitute the majority) are open for public scrutiny and debate; allow for broad-based participation in formulation, review, and change; and are essentially linked into the overall social consensus on development.

Among the first actions to be considered would be to initiate a debate about the concept of universal service — the parameters involved, reasonable targets, the instruments required, and so forth.

In the Information Society, relatively humble network features or service developments can herald explosive growth of new, potentially beneficial applications. The Internet is an example that springs to mind.

This reinforces the need for an ongoing, regular, and transparent review process for universal service, its goals, and its means, building on benchmarks established at the outset. Furthermore, it also underlines the need for the genuine and broad-based participation of all the relevant sectors of the public and users. Such participation will be a central feature in ensuring that the sector responds to real user needs and contributes positively to social and economic development.

## CHAPTER 5

# INTERNATIONAL EXPERIENCE IN REGULATION AND UNIVERSAL SERVICE

This final chapter outlines experience in regulation and universal service that might suggest possibilities for future research. The first section, "Some Relevant Experience," considers in some depth countries with experience considered most relevant to South Africa and for which information was readily available. In some countries, the sectoral and regulatory system as a whole is of interest. In others, just one specific aspect is highlighted. Although there is no country directly comparable with South Africa, countries selected are generally in transition to partial or even complete liberalization; have a reasonably sized population; have significant developed and undeveloped regions; and have attempted in innovative ways to address universal service. The second section, "Future Research Possibilities," briefly looks at the experience of a second set of countries that might suggest some useful directions for further research. Some of the experience is relevant, but more detailed information was unavailable.

### **Some relevant experience**

The following profiles cover the regulatory and structural context of the telecommunications sector in various countries; mechanisms for universal service, if any, are also discussed. The sources of information for each profile are given in Table 1. The profiles are broadly presented in order of relevance.

#### **South Korea**

South Korea rapidly expanded its teledensity during the 1980s with a concerted investment drive in its national monopoly operator. Universal service was at the centre of this policy. Since 1990 the emphasis has shifted to international compe-



**Table 1.** Sources of information for the "experience" profiles.

| Country <sup>a</sup> | Sources   |
|----------------------|---|
| South Korea          | Kim and Lee (1991); Larson (1995); Cho et al. (1996); Claydon (1996)  |
| Peru                 | <i>International Herald Tribune</i> (1995); ITU (1995c, annex IV); OSIPTEL (1995); Pyramid Research, Inc. — Latin America (1995)                                |
| Philippines          | CTMS (1995); Wolf and Sussman (1995); APTA (1996a–c, e)   |
| Brazil               | DeLottinville (1995); Straubhaar (1995); Goussal (1996); Lars Qvortrup (personal communication, 1996); Marcio Wohlers de Almeida (personal communication, 1996) |
| India                | APTA (1995a); CTMS (1995); Mody (1995); Sinha (1996)  |
| Poland               | Berlage (1995); International Technology Consultants (1995); Marek (1995); Scherer (1995)   |

<sup>a</sup> Profiles are broadly presented in order of relevance to South Africa.

petitiveness and advanced services, and three phases of liberalization have been introduced. In 1993, South Korea developed an ambitious plan to bring the Information Society to all users by 2015; again, the issue of universal service was prominent, this time in the context of gradual liberalization.

#### *Historical development*

The number of telephone subscribers has increased from 2.3 million in 1979 to more than 20 million; teledensity has increased from 7% in 1982 to almost 40%. This growth was the result mainly of the strategic importance devoted in the early 1980s to telecommunications, seen as a bottleneck in the rapid general economic growth of the 1960s and 1970s. The explosive growth was thus underpinned by very significant pent-up demand.

KT was separated from the Ministry of Communication (MOC) to develop the telephony network. By the end of the 1980s, there were government-owned operators in telephony, mobile (Korea Mobile Telecommunications [KMT]), leased lines (Dacom), and services at ports (Korea Port Telephone Co. Ltd [KPT]).

During this period, priority was given to investment in rural areas. Expansion was driven by the Immediate Telephone Installation System (ITIS) policies, aimed at rapid extension of the network; and the Widening and Automation (WA) policies, focused specifically on reducing the gap between rural and urban areas. The WA and ITIS policies were pursued throughout the period with about the same intensity: the rural aspect was at least as important as general network extension.

Tariffs in general were controlled by MOC, but the rural aspects of tariff policies were pursued vigorously under the WA policies. For instance, the number of local-call areas was reduced from about 1 600 to about 150 through extension of their radius; and late in the 1980s, a national flat-rate usage tariff became a policy goal. Uniform connection charges also came into effect (which meant a rise in urban areas and a fall in rural areas), and this generated further funds for network expansion. Rural areas were given priority over urban areas for the installation of digital switching (partly because of the large amount of money already invested in analogue switches in urban areas).

Additional funds for this expansion were raised from several sources. First, various laws had been enacted from the 1960s through the 1980s to raise funds from bonds and other national sources. Second, tariffs were structured to maximize investment funding. Third, telecommunications was given priority in the fifth 5-year economic-development plan (1982–86), rising from 3% of total national fixed assets in 1970 to 7% in the 1980s.

In sum, South Korea pursued a determined approach to network expansion in the 1980s, fairly conventional but imaginative in implementation, which laid the basis for a modern telecommunications network and focused heavily on universal service, both territorially and in terms of tariffs. By the 1990s, internal and external pressures to liberalize the structure were building; ironically, the achievements in universal service of the previous decade offered a space for such developments to take root.

### *Policies in the 1990s*

There have been three waves of policies during the 1990s, each successively extending the sphere of competition and extent of privatization.

COMPETITION — In 1990, the first policy review permitted a duopoly in international services for voice and data. Competing licences were also issued in paging services, provoking rapid growth. After some delays, a licence for a second mobile carrier was also approved, although the network is only now in place.

The second wave began in 1994, under pressure from the major Korean industrialists and from increasing integration with the global economy and trading organizations. Competition was introduced in the long-distance market — Dacom, the national data carrier, was granted a licence to compete with KT in long-distance service — and new licences were also issued in wireless personal communication service systems.

The third wave of changes began in July 1995 as liberalization gathered pace globally. Full competition is being introduced gradually into all markets, but

with the important exception of local services. Although there is no longer any legal basis for monopoly at the local level, no specific enabling policy has been developed. On this issue, the MOC has said in 1995 that "at present, the issue of competition in local voice telephony is not yet resolved. The issue will be further studied in the context of the KII, universal service, and alternative means of competition including CATV." The reference to CATV relates to the regulations governing CATV ownership, which are wide ranging. The regulations split the sector into three discrete subsectors: program providers, system operators, and network operators. They also prohibit multiple ownership and award regional monopoly licences, some of which are owned by KT. However, very recent reports suggest that wireless licences may be issued by 1997, and one of the major CATV network operators may begin to offer local services.

The 1995 policy review also left intact the extensive ownership restrictions. In any telephony service, no foreign participation is currently permitted, and for cellular it is restricted to a maximum 33% shareholding and minority status. In telephony, only 10% of shares may be held by any individual or consortium.

However, very recently the government announced its intention to allow up to 25% of KT to be sold to foreign investors, and there is a strong expectation that other restrictions will gradually be lifted. The rationale for such regulation seems to have been that telecommunications is a public good. Furthermore, there has been public resistance to non-Korean control of key sectors: a riot and strike occurred when full-scale privatization was mooted in mid-1995.

**PRIVATIZATION** — Nevertheless, gradual privatization has begun. Until 1992, KT was fully government owned and held controlling shares in Dacom (34%), KMT (62%), and KPT (89%). In 1993, Dacom was privatized, sold to existing shareholders. In 1994, all but 15% of KMT was privatized, taken over by one of the top five Korean conglomerates. KPT is also to be privatized soon.

Privatization of KT itself is also planned, but so far only 20% has been sold. Fears of destabilizing the stock market have stalled further privatization, as have unpopularity and allegations of bribery, but it is now expected that before the end of the year a further issue will be made, possibly to foreign investors. In preparation, KT has announced it is cutting its headquarters staff by one third and streamlining the organization. It is also ending any remaining cross-subsidization of local service by long-distance tariffs.

**REGULATION** — Throughout all this, Korea has maintained an unusually strong government hand on regulation. Regulation is the direct responsibility of the Ministry of Information and Communication (MIC), which replaced the MOC in

1994 (see below). MIC also develops policy and owns KT. Although policy development is relatively open, there is no autonomous regulator. In 1992, the Korean Communication Commission (KCC) was created within the Ministry to support the development of competition by settling disputes and investigating anticompetitive behaviour. However, KCC needs more resources, has few powers, and has engaged in limited activity. The most recent policy review promised an expansion of its role, and in 1996 it was announced that KCC would become independent of MIC.

#### *The Korean Information Infrastructure program*

The mention of universal service alongside the KII program in the quotation above is interesting because it reflects the belief that although universal service in basic telephony has been largely achieved, liberalization may not on its own support the development of universal service in the Information Society or in more advanced services. The KII was launched in 1993 to oversee the investment of 60 billion USD in constructing the "New Korea Net-Government" (G-NET) and the "New Korea Net-Public" (P-NET). Paid for by the government, G-NET will by 2010 link all public institutions, research institutes, and universities with the most advanced services at affordable costs. The P-NET, to be financed and built by service providers, will take 5 years longer but will bring fibre optics to all businesses and homes.

In 1994, MOC was significantly restructured; in its expanded form it became MIC, adding the information industry and all associated policies to its portfolio. MIC is pursuing several avenues in its efforts to implement the KII. First, it is creating the environment for private-sector investment (in the P-NET, etc.), with a set of proposals for investment and regulation of business. Included in this is a consideration of the issues related to CATV, which may lead to competition in local service in the medium term. However, universal service is also very much on MIC's agenda, although the policy has not yet been elaborated in any depth.

#### *Promoting an Information-Society culture*

Central to the KII, however, is the extension of Korea's emphasis on education to cover the information and informatics domain. During the 1980s and into the 1990s, Korea set up a number of communications and telecommunications training institutes, research centres, and development agencies and greatly expanded the university research facilities. The Information Culture Centre of Korea (ICCK) was established in 1988 to speed up computer literacy; it was reconstituted in 1992 with a broader remit and more funding. Under MIC, ICCK is seen as the

lead organization in promoting the Information Society in Korea. The Korean Information Society Development Institute focuses on the research tasks, including those relating to rural and regional aspects.

The regional element is seen as especially important, as are access to services and their use. ICCK works closely with the 600-member Council on Information Society Development, representing a broad cross section of society and promoting balanced development across Korea's regions. ICCK has organized committees under the local MIC offices to promote regional "informatization" in each of the eight major regions. The committees' mandates are to educate the public, provide publicity, monitor public opinion, propose policies, and establish informatization plans appropriate to their own regional conditions.

ICCK opened 18 rural facilities to provide computer education free to rural residents to help reduce the gap between urban and rural areas. The classrooms, located in regional post offices in farming and fishing villages, are fully equipped with instructional aids, including personal computers, printers, overhead projectors, televisions, and videocassette recorders. Each classroom can accommodate 30 students for month-long sessions, with three 2-h classes a day. More than 1 200 teachers were trained for the job.

This was just one among a plethora of government-sponsored initiatives to introduce the idea of the Information Society to all areas of Korea; the initiatives are continuing today. MIC, for instance, actively supports a range of social and public services, such as telemedicine and on-line access to public information. Surveys have shown a relatively high awareness of the Information Society among the public, although this awareness is still unevenly distributed between urban and rural areas.

## **Peru**

In the context of recent liberalization, Peru has created a fund, FITEL, paid for by a tax on the industry and aimed at supporting universal service in rural areas. A least-subsidy auction will be held during 1996 to supply rural services. There has also been a rapid growth of low-cost Internet use in Peru, and this has potential as a tool for development.

### *Regulation and structure*

In 1994, a new legal framework for telecommunications was adopted in Peru. The operator (local, long distance, international) was privatized and has been given 5 years (to June 1999) to make the transition from monopoly to competitive supplier, with the focus being on rebalancing tariffs. Advanced services, such as

mobile and paging, are already competitive. The private operator is Telefónica del Perú (Peru telephone).

The Ministry of Transport, Communications, Housing and Construction (MTCHC) develops policy, administers the radio spectrum, approves technical standards, and issues licences. OSIPTEL was created as the regulatory body and is relatively autonomous: the board consists of a chair, two government representatives, and three industry representatives. OSIPTEL administers FITEL (see below), safeguards competition, sets tariff limits, resolves disputes, and checks and approves equipment.

#### *Universal-service mechanisms*

People living in the rural areas of Peru are engaged primarily in agricultural activities and represent about 27% of the economically active population. About two thirds of the rural population lives in poverty. Telefónica, as a condition of its concession, must provide at least one public telephone in 1 500 of the 2 900 population centres of between 500 and 3 000 inhabitants (and in all towns with more than 3 000 inhabitants). All remaining areas, including some 70 000 villages of fewer than 500 people, are available for licences.

FITEL was established in 1994, with the aim of financing all or part of the telecommunications in rural areas and with the explicit intention of achieving universal service. The fund is financed by a 1% tax (administered by OSIPTEL) on gross annual billings of all telecommunications providers (including CATV). The tax has generated an average of 450 000 USD per month since March 1994, and the fund is now expected to grow by about 12 million USD annually.

The proceeds will be used to finance telecommunications in rural areas or in places considered of preferential social interest (as determined by MTCHC). OSIPTEL, as the fund administrator, is in charge of selecting telecommunications projects for FITEL funding, to be approved by MTCHC. OSIPTEL is developing a strategy for rural communications, analyzing various strategies for using FITEL. A government-owned operator is not an option, as it would now be illegal in Peru's restrictive regime for state activities. OSIPTEL also considered becoming a "mezzanine banker" for the private sector but concluded that there would be insufficient incentive for investment.

The proposal now is to use FITEL to leverage significant amounts of private-sector investment through a least-subsidy auction of concessions. To this end, OSIPTEL will in late 1996 issue a tender for operating concessions in the form of packages. Each package (or zone) would comprise a set number of rural areas, selected from both those not covered by the Telefónica concession and those that will become available after June 1999. (The inclusion of the latter areas

is intended to ensure that an operator will be present on the ground by the time the Telefónica concession runs out.) The idea is that operators compete for the FITEL subsidy, with the lowest bid winning. Operators may bid for several zones, combining the two area types. OSIPTEL put out a request in December 1995 for consultants to assist in the tender process.

There has been another interesting development in Peru. The RCP is an Internet provider that had grown from 171 local nodes to 1 200 by October 1995, as high as in Argentina. RCP hopes to soon upgrade access to T3 level, ahead of any others in Latin America.

Only 5% of users pay for the Internet service. Many users are academic institutions and NGOs. The service is run on a nonprofit basis. It is similar to Freenets in Canada but has no government subsidy. The promoters see it as a tool for development and are encouraging small firms to set up Web pages to showcase products. The government is also using it to disseminate information about elections.

International Business Machines Corp. and Telefónica are soon to set up competing services for business.

## **Philippines**

Of particular interest in the Philippines is the recent twinning of licences, whereby those awarded lucrative international or mobile licences in one region are obliged to put in large numbers of local lines in nonlucrative remote and rural areas. The success of this scheme has yet to be proven.

### *Regulation and structure*

The basic-service monopoly was for a long time privately owned in the Philippines and has one of the worst records in the region in absolute terms of teledensity and especially in bringing services to the rural population. The Philippines Long Distance Telephone Company (PLDT), until recently the only significant operator, is also one of the least efficient in the region, with 65 lines per employee, compared with 196 in Hong Kong. The focus of investment, with the advice of the World Bank, has been exclusively on ensuring that the transnational capital sector is supplied with its requirements in the few zones from which it operates. This has left very significant pent-up investment potential in many urban areas and even some poorer rural ones.

In 1993, the government took two steps that might dent PLDT's virtual monopoly: it ordered the interconnection of networks, thus forcing PLDT to share its trunk networks with others; and it issued eight international and five mobile licences linked to the provision of local services, thus encouraging competition.

Regulation in the Philippines is carried out by the National Telecommunications Commission (NTC).

*Universal-service mechanisms*

NTC divided the country into 11 licence zones (4 in Manila), and agreements on the distribution and twinning of lucrative and nonlucrative licences were then negotiated between the licencees and the government. Each of the eight international-service licencees must install 300 000 new local-access lines in matched rural areas; each of the five cellular-service licencees, 400 000. Each new line costs about 1 000 USD. The international-service licencees must also maintain 300 local lines per international switching terminal.

- Globe Telecoms, a joint venture between Ayala Corporation and Singapore Telecom, was awarded the lucrative Manila business district of Makati, plus a strip of Mindanao, one of the least-developed parts of the country, for its quota of local lines. Ayala, a holding company, already owns large swathes of Makati.
- Smart Communications, owned by First Pacific of Hong Kong and Japan's Nippon Telegraph and Telephone Corporation, was also given an international licence for a wealthy part of Manila (where office development is under way, funded by a subsidiary of First Pacific). But it must also lay down 300 000 local lines in a part of Luzon Island.

In some cases, licences were awarded for both cellular and international services, resulting in a requirement to put in 700 000 lines. In addition, the licencees would pay access charges to PLDT for interconnection to the backbone network; a deal has just been worked out between PLDT and most of the new licencees.

Responding to the threat of competition, PLDT will have installed almost 1 million new lines by 1996, mainly in the most profitable areas. At the same time, PLDT has started cutting its staff (including many managers) for the first time. An additional 2 million lines are planned.

Some mechanisms have been put in place to ensure that the new licencees meet their quotas — they were required to deposit in an escrow account 20% of their computed capital cost, to be offset against future expenditure if they meet their deadlines. However, the government's poor record in rural telecommunications, even in the recent past, is not encouraging. Both PLDT and most new competitors are controlled by families that wield enormous political and economic



power. Although the government is agreeable to playing one against another in an attempt to encourage competition, the question in the end is whether adequate regulatory controls can be put in place.

It is expected that the eight companies involved will be reduced to two or three consolidated carriers within a few years, which is likely to further increase the power of the new operators, possibly at the expense of regulation. Furthermore, it is uncertain how mergers and bankruptcies might affect the rural-line obligations.

Current plans, however, are to increase teledensity to 8.4% by 2000. The total cost is expected to be more than 6.5 million USD. The Chief of NTC said recently that he expects the number of lines to double to 3 million during 1996, based on a detailed agreement worked out with four of the new licencees and PLDT investment.

## **Brazil**

### *Regulation and structure*

Telebrás is the primary supplier of international, interstate, and local telecommunications services in Brazil. It is a publicly owned monopoly, listed on the stock market. At the end of 1995, there were around 14.6 million fixed lines and around 1.6 million cellular lines. With assets of about 31 billion USD, Telebrás is the third largest company in Brazil. Incorporated in 1972, it is the dominant monopoly player in the voice and data services and equipment markets. Through its 28 operating companies, Telebrás owns 94% of all public exchanges and 91% of Brazil's local telephone lines. Through a subsidiary, Embratel, the company also owns and operates 100% of the interstate and international long-distance transmission facilities. Telebrás also provides other telecommunications services, including telex, telegraph, mobile cellular radio, and data transmission. Telebrás receives no subsidy from the government.

There are only informal plans to privatize Telebrás. The government has announced its intention to privatize, but a timetable has yet to appear. The government says it will first consolidate the 27 operating companies and Embratel into 6 or 7 regional operating companies. Privatization is likely to proceed after 1997, but there are no plans to introduce competition in basic services.

Telebrás and its subsidiaries are regulated by the Ministry of Communications (MOC) in conjunction with the Ministry of Finance (MOF). There is no separate regulator. Telebrás' mandate, in addition to acting as a holding company, is to implement policies of the Executive Branch of the Federal Government of Brazil to modernize and expand the country's telecommunications networks.

Telebrás is required by law to own at least 51% of each subsidiary's voting stock. Each Telebrás subsidiary, with the exception of Embratel (which operates nationwide), is limited to operating within a state. Telebrás maintains a firm hand on each of its operating companies, controlling current operations and future growth. In addition, all important administrative decisions made by the subsidiaries must receive Telebrás' approval.

Although judicially independent from MOC, Telebrás operates under a large number of constraints: tariffs are regulated by MOF; limits to investment are set by Congress; complex rules must be followed for purchasing equipment, often extending the process; and so on.

#### *Advanced services*

In August 1995, the constitutional monopoly of the federal government ended with the passing of a constitutional amendment. After that, the government put forward a bill (currently in discussion in Congress) regulating private-sector franchises in cellular telephony, satellite services, and value-added network services (VANS). However, the private sector is already operating VANs (there are four companies offering leases).

The private sector will begin the operation of B-band cellular telephony, probably during 1997. This is a major political issue at present. The government originally proposed to limit foreign capital in the voting shares to 49%, but Congress is proposing no restriction. There is a serious debate on the issue.

The private sector is already in paging; a number of companies offer services, but none in the public sector.

#### *Universal-service mechanisms*

There is no universal-service fund or any other specific mechanism, and MOC does not have regulations aimed at achieving universal service. One of the major obstacles to universal service is the limit on investment set each year by Congress. Another is the low income of the majority of the population.

**OBLIGATION** — There is no formal or legal universal-service obligation. However, there are political commitments (arising from obligations of state ownership) to extend the basic network to poor areas of large cities and to smaller cities of the hinterland. Although universal service has never been the subject of a legal instrument, a general bill was scheduled for proposal in the summer of 1996.

There is no public consultation process when the government formulates telecommunications policies, but MOC raises the issues in a number of published

documents. In the absence of such a process, though, there has been considerable informed discussion of the topic.

**TARIFF CROSS-SUBSIDIES** — Tariff control has been used as an instrument to dampen inflation; indeed, it was so overused that tariffs today are very low. The government is rebalancing the tariffs but in a way that will not cause inflation, the main fear. Tariffs bands are the same everywhere in the country (that is, there is no tariff deaveraging).

Because tariffs for local service are below cost, the provision of this service is subsidized by higher rates for domestic and international long-distance services. Tariffs for these long-distance services vary according to peak-period use, duration, distance, and use of nonautomated service. Local-service revenues come from charges for fixed monthly usage, local and long-distance usage, maintenance, and customer service. Commercial users, who account for almost 30% of the total lines in service, pay monthly rental charges four times the residential rate and account for more than 60% of total revenues.

Furthermore, about 70% of the main lines are not economically feasible (the revenues earned are less than average cost), as traffic is very low. Thus, the 30% of the main lines with high levels of traffic subsidize the rest.

In addition to a nominal installation charge, new customers seeking lines are required to purchase shares in Telebrás at book value as part of a process called autofinancing. Although the cost of autofinancing varies according to region and operating company, the average rate is 1 200 USD.

**OTHER ACTIONS** — In November 1995 the government announced a target plan for telecommunications services to 2003 that raises the issue of universal service. The name of this plan is Programa de Recuperaçã o e Ampliacao do Sistema de Telecomunicacoes e do Servico Postal (PASTE, program for the recuperation and [or] expansion of the telecommunications system and postal service). PASTE explicitly recognizes that 90% of the families earning more than 1 000 USD per month are well provided for by the telecommunications system, but the penetration rate among families earning less than 300 USD per month is insignificant. One of the objectives of PASTE is to address this by a number of means:

- Reduction of connections tariffs through the appropriation of technological gains and productivity;
- The launch of affordable tariffs for this low-revenue market;

- Adoption of creative and special technologies designed for this market, with comparable service quality; and
- Reduction of the costs of setting up the physical facilities of the system.

One approach to universal service involves the "virtual telephone." Users have a phone number but no telephone and are charged 12–15 USD per month. An answering machine located at the central exchange records all the calls to their number. The users call their number (from a public or private terminal) and (using a password) can hear their messages or even download some faxes. The government is promoting this system to the very small enterprises that characterize the informal sector of the economy. About 40 000 people now have virtual telephones, and PASTE expects to have about 3 million subscribers in 3 or 4 years. PASTE also expects to double the number of public phones to five per 1 000 people by 1998. There are some cultural barriers to the use of the virtual telephone, but effective marketing is expected to eventually reduce or eliminate these.

A ministerial decree in 1990 authorized communities and developers to build local networks for interconnection with the public switching network, and several have taken advantage of this.

Brazil has piloted four teleservice centres, intended to support usage and not simply access, and is currently planning an extension of these. In 1992 and 1993, Telebrás built a pilot telecentre (*telecentro*) in Brusque, Santa Catarina; in Toledo, Paraná, Mossoró; in Rio Grande do Norte; and in Juazeiro do Norte, Ceará. The telecentre is a new approach for Telebrás. The aim is to enhance the quality of life and promote development activities through the intensive and extensive use of telematic services. The telecentres provide services, in partnership with local interests, to different target groups in urban and rural areas to support local business generally, as well as specifically in the use of telecommunications facilities. Each telecentre offers

- Telephones and fax machines for public use;
- Telematic access to public-service information (water supply, electricity, tax authorities, etc.);
- Computer training;
- General business advice;

- Access to office facilities (service offices, computers, fax machines, etc.); and
- Access to database services.

Usage has been fairly high. For instance, the centre at Brusque, a city with a population of 50 000, had on average 668 users per month between October 1992 and August 1993. More recent figures from Toledo indicate continuing growth. The year to October 1995 saw a total of 131 476 individual uses (many, of course, by the same individuals). The most popular feature was the public-service module (66 364 uses), followed by the teleoffice module (55 079 uses) and the tuition module (10 033 uses). Although these figures may simply represent individuals making phone calls, they nevertheless record a growth of more than 40% over the previous year.

Apart from the telecentres piloted with some success by Telebrás, a number of others have also been set up in partnership with local governments or local trade organizations.

## India

India is implementing a far-reaching liberalization program for local telecommunications services: the government is issuing multiple licences with rural-development obligations and raising significant funds from licence fees. At the same time, and contrary to the norm, neither corporatization of national services or privatization of any services is envisaged in the near future.

India also restructured the tariffs recently to improve rural affordability.

### *1994 legislation*

Traditionally, the government used telecommunications as a means of raising revenue, making telephone service fairly expensive. There had been relatively little investment in network extension to poorer areas; in effect, telecommunications was used to support the emerging two-class system, with the wealthier class alone able to afford access. However, a combination of factors made this situation insupportable in recent years, and new policies began to emerge in the 1990s.

Although advanced services have been open to private participation since 1991, a more radical revision was inaugurated with the *Telecommunications Policy Act* of 1994. Under the Act, limited liberalization was chosen over corporatization or privatization of the state-owned monopolies, thus ignoring the conventional wisdom of, for instance, the World Bank. Also atypically, the local market was chosen to begin liberalization.

The Act promises "to achieve universal service covering all villages as early as possible. What is meant by universal service is the provision of access to all people for certain basic telecom services at affordable and reasonable prices." The target for covering all villages was given as 1997, and private-sector investment was recognized as essential to achieving this.

#### *Regulation and structure*

International services are a monopoly of VSNL until 2004; the Department of Telecommunications (DOT) maintains a direct monopoly on domestic long-distance service. During 1995, the Indian government began the process of granting licences in local telephony and mobile services. Each state is to have two licences for mobile services and one new licence for local (state-wide) basic services, a total of 20 basic licences. Foreign firms are permitted to hold up to 47% equity, and licences are initially valid for 10 years, with a review after 5. The basic=telephony licencees will be in direct competition with the existing state operator, DOT.

DOT also oversees the calls for tenders for licences and has the final say in the selection of winners, but the regulatory situation is supposed to be changing. Under pressure from potential bidders and the US Department of Commerce, the government had indicated that a regulatory authority independent of DOT would be established by April 1995, the original date for accepting licence tenders. However, the establishment of the Telecommunications Regulatory Authority of India has now been delayed, and a revised date has not been announced. In the meantime, the Telecom Commission, under DOT, continues to regulate, to the dissatisfaction of newly licenced operators.

#### *Universal-service mechanisms*

The decision to split the country into so many regions was partly motivated by a desire to ensure that less-developed as well as more-developed regions would receive investment quickly and that the technologies chosen would suit the circumstances of each region.

However, major problems arose in the basic-service licence competition: new conditions were announced at the last minute and even after the competition closed. Licences were divided into three categories, according to their desirability, A, B, and C. Although there were many applications for all licences, an Indian-Israeli-Thai consortium (Himachal Futuristic Communications Ltd-Bezeq Telecom) bid well above all expectations for eight of these. DOT granted the consortium four: in Delhi (category A) and in Uttah Pradish, Haryana, and Orissa (category C). Another consortium was granted the fifth licence, in Maharashtra

(category A). DOT decided to hold a fresh call for the other 15, with no more than three licences to be granted to any consortium. The closing date for offers was 1 January 1996.

The second call for bids stipulated that a minimum of 10% of direct-exchange lines at the end of 12 months, 24 months, and 36 months must be public telephones in villages (the staggering is to ensure licencees do not leave it all to the last moment). Licencees would also be obliged to adhere to DOT tariffs. Preference would be given to bidders who would put in a larger number of lines in the first 3 years of the licence. However, the main emphasis of the competition was on how much bidders were willing to pay for a licence.

A reserve fee was placed on each of the three licence types. However, the outcome of the fresh call shows that the reserve on the least-lucrative C category was too high: a number of poorer regions attracted no bids at all. Since then, DOT has knocked 33% off the reserve fee for the category C licences and 25% off the reserve fee for the remaining category B licences in an effort to draw more bids in a renewed call.

The fees for the five licences issued so far will raise a total of 10.47 billion USD over a period of 15 years. This is estimated to be between 5 and 7.5% of potential income. From March 1995 to March 1996 alone, DOT was expecting to collect 1.06 billion USD. If such licence fees are directed toward the exchequer and not toward providing universal service, this could have a detrimental effect on universal service because the licencees would have to recoup the cost from tariffs. Certainly, the experience in telecommunications in the past has been that the government siphoned away much of the profits, leading to underinvestment and unmet demand. The new operators are reported to be teaming up together to exact lower licence fees from the government in return for lower user tariffs.

Although the Telecom Commission claims the fees raised will be spent on long-distance transmission and international network facilities to cope with the rising number of new telephone connections and private operators entering the market, some commentators in India have argued that this will "stymie universal-service obligations which call for lines for all and services at affordable rates."

At the same time, DOT has announced that it expects the target of 7.5 million lines in the 5-year plan for 1992-97 to be exceeded by 2.5 million. Seven million connections were added in the first 4 years, although the last year has seen a major slowdown. In particular, the number of village phones added in the year to March 1996 fell well below the target of 105 000. The shortfall was put down to the "nonavailability of equipment and accessories from manufacturers." Connections have also been delayed because of "scarcity of radio frequency in the VHF [very high frequency] band."

In November 1995, the Indian government introduced a package of tariff concessions for rural areas where telephone services were running at a loss. The “rural telecoms package” had the following provisions:

- The number of free calls rural users could make increased from 150 to 250, and there would be a 25% reduction in charges for the next 200 calls beyond this free-call limit.
- The line-rental fees would fall from 150 INR to 100 INR (in 1996, 35.7 Indian rupees [INR] = 1 USD) in a bimonthly billing cycle.
- The connection fee would fall from 2 000 INR to 1 000 INR.
- The installation charge would fall from 800–1 000 INR to 300 INR (until April 1998).
- Local-call areas would expand to 30 km and be metered for a longer duration.

These concessions were expected to cost DOT about 60 million USD. The new licencees will not be expected to continue these concessions. By the end of March 1995, 194 000 villages had access to a telephone. By the end of March 1996, a further 105 000 villages were to have been added (although this target was not reached, as already mentioned), leaving about 250 000 villages still without service. The overall aim is for every village in India to have a phone connection provided by DOT or the new private licencees within the next 20 months.

## **Poland**

### *Local community networks*

In Poland, local communities, often with the involvement of local authorities and electronics firms, are developing telecommunications networks for local services. However, a number of obstacles highlight some of the contradictions involved in such efforts and the ad hoc approach to regulation.

The Polish *Communication Act* of 1990 has permitted the issue of licences (including competitive licences) for local telecommunications services while (in effect, though not in law) retaining a monopoly for Telekomunikacja Polska SA (TP SA) in international and long-distance services. Any company with the requisite capital or know-how may be granted a licence to deliver local services. TP SA has itself concentrated on the modernization of the international and long-distance



network. As a result of very loose conditions, about 80 local licences had been granted by 1994, with a promise of a new switching capacity of 2 million lines. However, lack of capital has prevented most of them from getting off the drawing board (US and EU investment solved the problem for a few). There were also complaints from licencees that the costs of cooperating (for interconnection) with TP SA are too high, a dispute that has yet to be resolved.

Among these licencees, a number of local communities in Poland have begun to organize cooperatives to provide basic telecommunications networks. Shareholders are often local equipment manufacturers, local businesses, and private-network customers. These committees for telephonization work in conjunction with TP SA, but they raise funds for the network themselves. Usually the committee is requested to donate the completed infrastructure to the local branch of TP SA in return for a waiver of the installation fee that would normally be payable. Such networks retain a licence for monopoly provision.

However, tariff regulations are not conducive to such local developments. There is no separate regulatory authority: the Ministry of Communications is responsible both for TP SA and for issuing licences to competitors. The Minister can set a maximum tariff for local services, and local tariffs are generally low, ensuring that services remain affordable but reducing the incentive to invest in network extension and improvement. Local licencees claim that TP SA is subsidizing local-call rates from its international and long-distance tariffs, which are high by international standards. Because local operators receive only the local tariffs for international calls from their customers (the rest goes to TP SA for interconnection), they are not in a position to provide such a subsidy.

Perhaps in part because a facilitative regulatory regime is not in place for smaller local entities, there appears to be a trend toward larger players becoming involved. In mid-1995, a Polish computer manufacturer applied for a local licence for one third of the country, about 3.1 million subscribers. The aim is to attract about 2 billion USD, mainly from foreign investors, over the next 5 years. (It has been estimated that about 12 billion USD in investment capital is required to bring Poland's teledensity up to 30%.) Another related development is a plan by a private company to link several local networks, thereby introducing competition in the long-distance network.

### **Future research possibilities**

The following brief notes may suggest directions for further research. The sources of information for each note are given in Table 2. The countries are ordered alphabetically and represent a more or less random selection from various regions of the world.

**Table 2.** Sources of information for the research possibilities.

| Country or region <sup>a</sup> | Source(s)  |
|--------------------------------|--|
| Argentina                      | ITU (1995b, annex I); Straubhaar (1995)            |
| Central and Eastern Europe     | Berlage (1995)                                     |
| Chile                          | ITU (1995b, annex II); Straubhaar et al. (1995)    |
| China                          | Tan (1994); Zhao and Junjia (1994); APTA (1996d)   |
| Colombia                       | Pyramid Research, Inc. — Latin America (1995)      |
| Dominican Republic             | ITU (1995b, annex III)                             |
| Lebanon                        | Pyramid Research, Inc. — Africa Middle East (1995) |
| Mozambique                     | Fernandes (1994a, b); Laidlaw (1994); TDM (1994)   |
| Thailand                       | World Bank (1995)                                  |
| Venezuela                      | Barrera (1995)                                     |
| Vietnam                        | Lars Engvall (personal communication, 1996)        |
| Zambia                         | ITU (1995c)  |
| Zimbabwe                       | ITU (1995c)  |

<sup>a</sup> Countries were more or less randomly selected from various regions of the world.

## Argentina

### *Regulation and structure*

Argentina privatized in 1990, maintaining a monopoly in basic services and allowing competition in mobile, data, paging, and national and international value-added services. The basic-service monopoly is to end in November 1997, although this may be extended by 3 years if the three main operators meet certain coverage and quality standards. Regulation is by a semiautonomous agency, the Comisión Nacional de Telecomunicaciones (national telecommunications commission). Tariff regulation moved from a rate-of-return system to a price-capping system, which has been modified since introduction.

### *Universal-service mechanisms*

Universal-service requirements are met by setting regional penetration levels for telephony, the minimum number of towns or localities to be covered by operators, and public-service standards. Operators, who still charge high long-distance and international tariffs, may finance this coverage through internal cross-subsidies. The cellular systems have achieved extensive coverage without subsidy.

## Central and Eastern Europe

### *Regulation and structure*

Although each country is different, Central and Eastern European countries have certain key aspects in common. All have been characterized by a relatively low level of telecommunications penetration and by antiquated and unreliable networks. All are going through a rapid transition from state-controlled monopoly to (various degrees of) liberalization. All are attempting to attract foreign capital in a bid to support collapsing indigenous industry and boost economic development and employment, including in the telecommunications sector. Thus, the telecommunications sector in each of these countries tends to exhibit variations of common themes.

In general, exclusive monopolies are being maintained in international and national services, sometimes with external capital. At a local level, a few countries have introduced competition in selected areas. Licences have been issued for joint ventures in cellular, with only Russia opting for competition. This service tends to be profitable, highly priced, and confined to the business (especially foreign-business) sector.

Regulatory structures are fragile, and a number of legal uncertainties exist in all but Hungary, Poland, and the Czech Republic.

### *Universal-service mechanisms*

Because of these common features, the countries face a broadly similar dilemma in relation to universal service, as outlined by Berlage (1995, p. 303):

The relative scarcity of capital with regard to investment opportunities and the risks in many areas of telecommunications in Eastern Europe have led to high profit expectations and in most cases short-term investment strategies and a restrained interest in the market. Therefore, foreign capital can be used as a means to finance the development of modern telecommunications services for business needs. However, since few investors are willing to accept longer pay-back periods, the chance of redistributing profits from private investors to finance universal service is limited in the short and medium run. The development of the local network will have to be financed mostly by the revenues of the state-owned operators, and therefore, the tariff policy and the development of private incomes will be the main determinants of future development.

Governments have tended to respond in a limited number of ways. Several countries are maintaining exclusive monopoly rights for operators (including rights to provide international services) and use the profits to finance local-service development. The usual strategy is to invest immediately in overlay networks to

develop the trunk network, linking together existing local networks and improving national and international connections. This generates revenues that will allow an improvement of local networks in the future, which currently operate at a loss. Joint ventures with private capital in this trunk-network development are sometimes favoured, as in Russia and Ukraine. Only Poland and Russia are planning to introduce some competition in this area, but others may follow, including the Czech Republic.

Poland and Hungary have opened up attractive areas in the local network to private investment. In Poland (see profile earlier in this chapter), this has involved a mixture of exclusive licences to unserved areas and competitive licences (although interconnection issues were not yet solved by 1993, leading to financial difficulties for some). So far, 15 licences have been issued. Investment comes from the local telecommunications industry and external sources.

Hungary probably has the most liberalized sector, having started along this path earlier than the other countries. The government has licenced 25 local areas in competition with the national operator, Matáv Rt (which has been partially privatized): local governments may demand the right to issue these if they can prove Matáv is not meeting their needs. Matáv retains the remaining 28 licences and is developing some as joint ventures. In Pest, for instance, a Finnish company has begun building a network in a joint venture with Matáv. In addition, Hungary created a telecommunications fund for rural areas.

In Russia, too, competing licences have been issued to joint ventures for networks in Moscow, Saint Petersburg, and economic zones in East Asia. Majority shares are held by domestic shareholders, often the local operator.

A number of countries that currently have local state-owned monopolies, including Estonia, Latvia, and Ukraine, are hoping that foreign partners in the trunk network will become involved in the local network; the Baltic countries have already come to an agreement with Scandinavian partners to that effect.

However, in most countries, local networks remain as monopolies of the state or regional government. In Russia, Ukraine, and Belarus, local networks are operated by local or regional government institutions. By 1993, about 200 of Russia's 4 000 regional operators were independent, but financing remains a problem in all of these.

Both Hungary and Ukraine have set up a telecommunications development fund to redistribute revenue from the national government and national operator to the networks run by regional governments (whose influence on national policy is considerable).

Many countries have initiated projects to bring telephony to rural villages not yet connected (estimated in 1992 to be as many as 1 500 in Poland, 3 000 in

Romania, and perhaps 20 000 in Russia). Most of these projects are backed by international finance from the EU. Usually, a public telephone and a line for the local government and local business are to be installed. Berlage (1995, p. 298) concluded that "given the shortage of capital, this is seen as sufficient to fulfil universal service obligations in the short run.

The connection of private households in peripheral regions is seen as a long term task for the national operator." In short, most countries concentrate on developing international and national access (under a monopoly regime) for the business sector as a means of generating revenue. Part of this revenue is usually invested in local networks. However, foreign participation and, even more, the introduction of competition, limit the extent to which universal-service obligations can be imposed.

At the same time, the more lucrative local markets have been opened to outside capital, but investors concentrate on premium services for business users and provide few universal-service benefits.

## **Chile**

### *Regulation and structure*

By 1991, Chile had an extremely liberalized telecommunications sector for all services, including local telephony. The state holds no significant share of any telecommunications operator. There are no universal-service obligations per se in licence issuing, only the requirement to provide service within the area for which the licence is granted.

The regulator is the Subsecretaría de Telecomunicaciones (SUBTEL, subsecretariat of telecommunications), under the Ministry of Transport and Telecommunications.

### *Universal-service mechanisms*

Liberalization, with dramatically (probably temporarily) reduced international and national tariffs, was detrimental to rural telephony and universal service. The expansion of telephone services in rural areas has come to a halt. This is exacerbated by the weakness of SUBTEL, whose interconnection and tariff controls are ineffective.

Universal service is handled by a fund allocated directly from the national budget. The aim is to increase coverage of the public telephone service in low-income rural and urban areas. The fund is managed by a council consisting of representatives from the different ministries and regions, who are appointed by the President. The council, in conjunction with the relevant authorities, draws up annual programs of projects and awards the contracts in open competitions.

## **China**

China maintains a state-owned monopoly, but private suppliers have licences in industry sectors where the monopoly cannot provide service. Government investment has resulted in rapid growth in the past decade. In 2 years (to the end of 1994), teledensity rose from 0.99% to 2.29% and pay phones increased from 84 000 to 270 000. In those 2 years alone, total telecommunications investment was about 15 billion USD. Teledensity is expected to rise to 8% by 2000.

## **Colombia**

In 1997, Colombia will open both long-distance and international markets to competition while retaining government ownership of the current monopoly, Telecom Colombia (privatization has been ruled out). However, as these are the most profitable areas, the government faces the challenges of instituting an effective regulatory regime to ensure that universal service at the local level will benefit. An advisory study was completed recently by consultants Booz Allen Hamilton.

## **Dominican Republic**

### *Regulation and structure*

Telecommunications has been in the private sector for 70 years in the Dominican Republic, and penetration is at about 10%. However, the growth of penetration has decreased in recent years as a result of the relaxation of universal-service aims: carriers have been permitted to invest simply in the most lucrative areas.

### *Universal-service mechanisms*

Tariffs are currently being rebalanced, with unregulated long-distance tariffs and fractional increases in local tariffs permitted. Connection of the first residential phone line is still regulated, but this is being relaxed.

## **Lebanon**

Because of the civil war in Lebanon, only 200 000 of the country's 525 000 installed main lines were in operation in 1993. An 800 million USD investment has been required for reconstruction of the network.

In April 1994, the Ministry of Public Telecommunications (MPT) issued two competing concessions for global systems for mobile communication (GSM) on a BOT basis. Licences are valid for 10 years (negotiable to 12), at which point networks will be transferred to MPT. The GSM licencees are guaranteed exclusive coverage for the first 8 years, contingent on the deployment of 30 000 lines by the

end of 1995. This was later raised to 55 000, a target that the operators are likely to have met. In addition, during the first 10 years, the operators must transfer 20% of gross revenues to MPT. MPT sees these concessions as a way to meet pent-up demand for basic services in a hurry while the long-term project to rebuild the land-line network is under way. To this end, the MPT has established a strict tariff regime, with a flat rate of 0.05 USD per minute. The connection fee is 500 USD, and monthly subscription is 25 USD (credit plans are available). Rates may be increased by 5% a year. The two operators were to have spent 300 million USD, but one claims to have spent double that.

Subscriber growth has greatly outpaced capacity, to the extent that operators have been told to stop taking on new users until they can handle them. Their main customer base consists of government officials and business people, but people 18–35 years old are also seen as a major market. Beirut accounts for almost 80% of the usage and is severely congested.

## **Mexico**

### *Regulation and structure*

Mexico fully privatized its telecommunications operator, Teléfonos de Mexico (TELMEX), in 1990. The operator has a monopoly on local services until 2025 and on all basic services until 1997. Regulation is the responsibility of the Department of Communications and Transport.

### *Universal-service mechanisms*

TELMEX was given the following universal-service targets:

- The number of lines must increase by 12% per annum until 1994.
- Towns with a population of 50 or more must have telephone service.
- Teledensity must increase.
- Maximum waiting time must be 1 month by 2000.

Pricing policy is  $RPI - x$ , where RPI is the retail-price index; and  $x$  is set at 0 from 1991 to 1996 and at 3% from 1997 to 1998.

## **Mozambique**

### *Regulation and structure*

Basic services (and cellular) are provided by a publicly owned monopoly, Telecomunicações de Moçambique (TDM, Mozambique telecommunications), which became a public company in 1992. Also in 1992, a regulatory body was estab-

lished. The 1992 *Telecommunications Law* is already under review. Competition is permitted in data transmission and value-added services, and TDM has entered into joint ventures with companies in subsidiary activities, including local network construction.

National tariffs for basic services are fixed by the government on the basis of proposals from the company. International tariffs are fixed by TDM. Tariffs in competitive services are unregulated. Basic government tariff policy to be pursued by TDM is as follows:

- Revenues must cover costs and (with external loans) support self-sustaining growth, without specific government investment.
- Basic tariff rates need to be reconciled with geographical averaging and for the extension of services to rural communities.
- Tariffs should reflect costs.

#### *Universal-service mechanisms*

General universal-service obligations are contained in the 1992 *Telecommunications Law*, according to which the state must guarantee basic service (telephony and telex) throughout the country. The government and TDM enter into 3-year program contracts (the current one runs to the end of 1996), stipulating specific goals. The universal-service goal is access to a public telephone within 5 km for everyone in the population. The next phase is to provide at least one public telephone in all 144 national district centres; these telephones will be linked to the national network. Growth in the number of lines is running at about 10% per annum. Under the 1994–98 investment plan, TDM is to develop an all-digital network and introduce a maritime radio system and cellular in the southern part of the country. A World Bank study (Laidlaw 1994) observed that “TDM is doing what it can, but is not able to provide universal access to the national network. ... The Government’s priority of extending service to the rural areas is simply not being adequately addressed. The problem is raising finance.”

## **Tanzania**

### *Regulation and structure*

Tanzania has two joint privately–publicly owned monopoly providers of basic services, one in Zanzibar and one in Tanzania, with plans to corporatize but no plans to fully privatize or liberalize (but private interests can own the majority share). There are three competing operators for data transmission and two mobile



licences per zone. Regulation is the responsibility of the Tanzanian Communications Commission (TCC). It is financed by licence fees from operators.

#### *Universal-service mechanisms*

The universal-service goal is the provision of public phones in rural and urban areas. There are plans for a Rural Telecommunications Development Fund, to be funded and managed by all operators and the TCC. Universal-service obligations are imposed as a licence condition. There are also trends to rebalance tariffs to reflect costs.

### **Thailand**

#### *Regulation and structure*

Thailand maintains a state-owned monopoly of two carriers: the Telecommunication Organization of Thailand (TOT) provides services locally, nationally, and with neighbours; and the Communications Authority of Thailand (CAT) provides the rest. Private licences in mobile and VANS are issued by CAT and TOT. Regulation is the responsibility of the Post and Telegraph Department (PTD) of the Ministry for Transport and Communications, TOT, and CAT.

#### *Universal-service mechanisms*

The basic network is being extended with two BTO schemes to install 2 million lines in Bangkok and 1 million lines in the rural provinces. The two concessions issued last for 25 years, with the private licencees building and operating the network. Ownership is passed to TOT before operation of the network has begun. The revenue is shared, with TOT receiving 16% of revenue from the Bangkok operator and 43.1% from the rural operator. In effect, TOT is the regulator of the BTO schemes, and the licencees may be considered in many ways subcontractors. Two previous BTO concessions were issued for mobile; between them they expect to attract up to 1 million subscribers in the near future. More recently, five BTO concessions were issued for private data-transmission services: two each by CAT and TOT and one by PTD.

### **Venezuela**

#### *Regulation and structure*

The Compañía Anónima Telefónos de Venezuela (CANTV, Venezuela telephone company limited) is a monopoly provider, but in 1991 it sold a 40% controlling share to General Telephone and Electronics Corporation for 1.89 billion USD. There are plans to privatize the remainder of CANTV. There is competition in

leased lines and in cellular and other advanced services. The network is in very poor condition. The number of lines (teledensity of 10%) is projected to double to 4 million by 2000.

Regulation is by an independent agency, the Comisión Nacional de Telecomunicaciones (CONATEL, national telecommunications commission).

#### *Universal-service mechanisms*

CONATEL's price-cap regulation allows for a controlled rebalancing to reduce cross-subsidies.

### **Vietnam**

Vietnam has a state-owned monopoly provider, Vietnam Posts and Telecommunications, affiliated with the Department General of Posts and Telecommunications. One licence was issued to Telstra in 1992 for long-distance lines, but current policy (apart from the intention of raising teledensity from 0.33% to 3% by 2000) is unclear. It is likely to become clearer after mid-1996, when a party congress is being held. A mobile concession was issued in August 1995, with a projected 100 000 lines within 3 years. Vietnam is also about to begin a pilot program for telecentres in urban and rural areas.

### **Zambia**

#### *Regulation and structure*

Zambia is about to undertake a major liberalization program, with all services planned for competition and privatization. The monopoly for basic service has recently been legally removed, and licences will be issued. Regulation is the responsibility of the Communications Authority of Zambia.

#### *Universal-service mechanisms*

The universal-service goal is to have telephone booths available nationwide in public places, such as clinics and schools. Private operators may be required to contribute 5% of annual revenues toward the development of rural telecommunications, but this has not yet been fully determined.

### **Zimbabwe**

#### *Regulation and structure*

The operator is a state-owned monopoly with no plans to change except toward corporatization. The Ministry of Information, Posts and Telecommunications is the regulator.

*Universal-service mechanisms*

The universal-service goal is to introduce basic telephony through network extension and cross-subsidization. The focus is on providing public call boxes accessible to the entire population.

## APPENDIX A

# STATISTICAL COMPARISONS OF TELEDENSITY AND NETWORK GROWTH

This appendix selectively presents data from an International Telecommunications Union study on teledensity and network growth between 1984 and 1994 (ITU 1995a). The data have not been subjected to systematic analysis and are intended simply to provide food for thought in relation to past and future performance of the South African telecommunications network.

### Network size

Network growth can be measured by compound annual growth rate (CAGR), calculated as follows:

$$\text{CAGR} = [(P_v/P_o)^{1/n}] - 1$$

where  $P_v$  is the present value;  $P_o$  is the original value; and  $n$  is the number of periods. CAGR between 1984 and 1994 correlates most closely, if negatively, with size of the network at the beginning of the period. The following countries all had annual growth rates of 15% or more during the decade to 1994 (global average was 5.2%), but all began with networks with fewer than 11 000 lines:

- Cape Verde grew by 23.8%, starting from 2 200 lines;
- The Gambia grew by 22.4%, starting from 2 400 lines;
- Mayotte grew by 21.1%, starting from 700 lines;
- Micronesia grew by 20.7%, starting from 2 100 lines;
- Saint Kitts and Nevis grew by 19.2%, starting from 2 400 lines;
- Maldives grew by 18.9%, starting from 2 100 lines;
- Grenada grew by 19.3%, starting from 3 600 lines;
- Botswana grew by 17%, starting from 10 600 lines;

**Table A1.** Fastest network growth, 1984–94.

| Country              | Annual growth<br>(CAGR), 1984–94<br>(%) | Total lines, 1984<br>(1 000s) | Lines per 100 population |                   |
|----------------------|---|-------------------------------|--------------------------|-------------------|
|                      |   |                               | 1984                     | 1994              |
| China                | 25.7                                    | 2 774                         | 0.27                     | 2.29              |
| Turkey               | 20.2                                    | 1 941                         | 3.93                     | 20.10             |
| Vietnam <sup>a</sup> | 20.2                                    | 70                            | 0.12                     | 0.61              |
| Thailand             | 18.1                                    | 520                           | 1.02                     | 4.69              |
| Indonesia            | 16.7                                    | 536                           | 0.33                     | 1.33              |
| Pakistan             | 16.6                                    | 441                           | 0.47                     | 1.62              |
| Morocco              | 16.5                                    | 215                           | 1.00                     | 3.75              |
| Dominican Republic   | 16.3                                    | 134                           | 2.14                     | 7.87              |
| Egypt                | 15.7                                    | 640                           | 1.41                     | 4.26              |
| Average of above     | 18.7 <sup>b</sup>                       | 793                           | 1.03 <sup>b</sup>        | 5.12 <sup>b</sup> |
| World average        | 5.2                                     | 3 156                         | 8.23                     | 11.57             |
| South Africa         | 6.0                                     | 2 153                         | 6.57                     | 9.48              |

Note: CAGR, compound annual growth rate.

<sup>a</sup> This is a small network of between 50 000 and 250 000 lines.

<sup>b</sup> Averages of figures above, not CAGR or lines per 100 in the aggregated population.

- Belize grew by 16.6%, starting from 6 100 lines; and
- Saint Vincent grew by 15.9%, starting from 3 900 lines.

The reason for these high growth rates is obvious — the networks were small to begin with. The data reveal the danger of looking at growth rates in isolation.

### Overall network growth

Table A1, which excludes networks that in 1984 had 50 000 or fewer main lines, lists in order countries that achieved annual growth rates above 15%. Although South Africa achieved a rate quite close to the world average, the correlation between network growth and teledensity in 1984 (again negative) appears to be a central determining feature. There could be a number of reasons for this. First, there is a known high correlation between network growth and rates of economic growth, and many countries during the 1980s came to recognize a quasi-causal relationship between them. Countries with low teledensity thus desired to begin to address this. It is noticeable also that a few of these countries experienced very high growth rates.

Second, a relatively low teledensity at the beginning of the period means that there is more likely to be considerable unmet, economically feasible demand

**Table A2.** Fastest past-comparable network growth, 1984–94 (total = 30).

| Country                             | Annual growth<br>(CAGR), 1984–94<br>(%) | Total lines, 1984<br>(1 000s) | Lines per 100 population |       |
|-------------------------------------|---|-------------------------------|--------------------------|-------|
|                                     |   |                               | 1984                     | 1994  |
| Turkey                              | 20.2                                    | 1 941                         | 3.93                     | 20.10 |
| Jamaica <sup>a</sup>                | 14.1                                    | 70                            | 2.99                     | 10.31 |
| Malaysia                            | 12.9                                    | 849                           | 5.56                     | 14.69 |
| Chile                               | 12.4                                    | 481                           | 4.04                     | 11.00 |
| Jordan <sup>a</sup>                 | 10.4                                    | 114                           | 4.47                     | 7.24  |
| Hungary                             | 9.4                                     | 705                           | 6.61                     | 17.04 |
| Trinidad and<br>Tobago <sup>a</sup> | 9.4                                     | 82                            | 7.23                     | 15.78 |
| Mexico                              | 9.3                                     | 3 504                         | 4.78                     | 9.25  |
| Colombia                            | 8.9                                     | 1 506                         | 5.21                     | 9.68  |
| Kazakhstan                          | 8.8                                     | 858                           | 5.49                     | 11.67 |
| Uruguay                             | 8.4                                     | 259                           | 8.69                     | 18.38 |
| Poland                              | 7.9                                     | 2 349                         | 6.36                     | 13.06 |
| Average of above                    | 11.0 <sup>b</sup>                       | 1 060                         | 5.45 <sup>b</sup>        | 13.18 |
| World average                       | 5.2                                     | 3 156                         | 8.23                     | 11.57 |
| South Africa                        | 6.0                                     | 2 153                         | 6.57                     | 9.48  |

Note: CAGR, compound annual growth rate.

<sup>a</sup> These are small networks of between 50 000 and 250 000 lines.

<sup>b</sup> Averages of figures above, not CAGR or lines per 100 in the aggregated population.

and also that the demand is more likely to exist in urban areas, which are far cheaper to connect than rural areas. In other words, not only are people willing to pay for services, but, all things being equal, a lower level of investment is generally required to raise the level of teledensity from 5% (that is, 5 lines for every 100 people) to 10% than from 10% to 15%. For this reason also (and some others), the growth of the network does not necessarily correlate with the growth of universal service or even of universal access. Furthermore, teledensity tells us nothing about the rural versus urban teledensity or the proportion of commercial to noncommercial users. There is thus a general weakness in using teledensity as an indicator of universal service.

### Growth of networks currently comparable in size

Table A2 shows the rate of network growth of the top dozen countries, maintaining the 1984 network size of more than 50 000 lines but including only networks with a teledensity that was either greater than 3% and less than 10% in

**Table A3.** Fastest future-comparable network growth, 1984–94 (total = 22).

| Country                           | Annual growth<br>(CAGR), 1984–94<br>(%) | Total lines, 1984<br>(1 000s) | Lines per 100 population |                    |
|-----------------------------------|---|-------------------------------|--------------------------|--------------------|
|                                   |   |                               | 1984                     | 1994               |
| United Arab Emirates <sup>a</sup> | 12.5                                    | 188                           | 14.43                    | 33.16              |
| South Korea                       | 12.2                                    | 5 595                         | 13.85                    | 39.70              |
| Reunion <sup>a</sup>              | 11.4                                    | 75                            | 13.88                    | 31.98              |
| Cyprus <sup>a</sup>               | 10.7                                    | 120                           | 18.10                    | 45.02              |
| Portugal                          | 10.0                                    | 1 324                         | 13.83                    | 35.03              |
| Puerto Rico                       | 9.2                                     | 547                           | 16.34                    | 36.07              |
| Croatia                           | 8.4                                     | 540                           | 11.63                    | 26.76              |
| Slovenia                          | 8.2                                     | 260                           | 13.53                    | 29.51              |
| Bahrain <sup>a</sup>              | 7.8                                     | 64                            | 15.81                    | 24.77              |
| Yugoslavia                        | 6.4                                     | 1 057                         | 11.01                    | 18.40              |
| Average of above                  | 9.7 <sup>b</sup>                        | 987                           | 14.20 <sup>b</sup>       | 32.00 <sup>b</sup> |
| World average                     | 5.2                                     | 3 156                         | 8.23                     | 11.57              |
| South Africa                      | 6.0                                     | 2 153                         | 6.57                     | 9.48               |

Note: CAGR, compound annual growth rate.

<sup>a</sup> These are small networks of between 50 000 and 250 000 lines.

<sup>b</sup> Averages of figures above, not CAGR or lines per 100 in the aggregated population.

1984 or had grown from less than 3% to more than 9.48% (the rate in South Africa; Jamaica just squeezes in) by 1994.

Average teledensity and network size of this group are much closer to those of South Africa, but not the annual growth rate. In fact, South Africa comes in at 10th lowest in the field of 30.

### **Growth of networks of future comparable size**

Table A3 lists the highest growth rates from among networks, again those with more than 50 000 lines in 1984, but beginning from a teledensity of 10–20%. There were 22 countries in this category. The table hints at what South Africa might be expected to achieve in the coming years, although the unique and diverse circumstances of many countries are obvious.

South Korea's performance — beginning with an already large network and expanding rapidly — is especially impressive. This expansion also placed a major emphasis on the provision of affordable service in rural and remote areas (see the profile on South Korea in Chapter 5).

## APPENDIX B

# TARIFF AVERAGING AND CROSS-SUBSIDIZATION

In this appendix, tariff averaging and tariff cross-subsidization, often mainstay supports for universal service, are discussed in some depth (they are also summarized in “Tariff Policies and Controls” in Chapter 3).

### **Tariff averaging**

Tariff averaging is a mechanism used virtually everywhere to reduce cost-related tariff variations to a relatively small number of tariff bands. Averaging is applied to what are generally regarded as the three elements of cost (and hence of tariffs):

- Connection charges, which are (notionally, at least) related to the cost of connection;
- Periodic rental fees, which are related in principle to the cost of upkeep and maintenance of the network connection; and
- Usage tariff bands, usually with local, one or a few long-distance, and several international rates (the absence of duration-based local calls is also a form of averaging, which in the past was based on a technological limitation).

Averaging is strongly associated with cross-subsidization (and hence with non-competitive tariffs), but in its narrowest definition, it need not be. In fact, tariff averaging is applied to rental and call fees in the most competitive of markets.



**Effects on universal service**

Averaging simply means concentrating tariffs at fixed points. If these points are broadly strung along a spectrum of the cost of providing the service, the effect is that the tariff charged to any individual is rounded up or down to the nearest fixed point. Obviously, individuals whose tariffs are rounded down the most benefit the most, and those whose tariffs are rounded up the most lose the most. The more tariff bands there are, the less extreme the rounding needed.

On its own, averaging effectively offers similar terms of access to differentiated groups of users. It tends to favour rural rather than urban areas, especially for connection fees. Rapidly falling maintenance and operation (usage) costs overall mean that the marginal cost for all users is both falling and converging, affecting the cost basis of rentals and usage. In theory, this should reduce the benefits and losses of averaging to any particular group, but the existing small number of rental and usage tariff bands means that low-volume users currently tend to benefit the most.

As a mechanism for universal service, averaging per se is relatively indiscriminate between different groups of users, with a general bias toward high-cost users, such as rural and low-usage groups. Even in the most liberalized environments, such as in the United Kingdom and in all the European Union countries (as a result of recent regulations), some degree of tariff averaging is retained in the explicit interest of universal service; that is, averaging is used as a means to deliberately cross-subsidize. In fact, tariff averaging may in its basic form have only a very weak cross-subsidization effect, and this can ultimately be justified by the cost to the provider of not averaging costs.

Averaging is applied partly to simplify the service supplier's accounting and billing procedures, and it puts the supplier in a position to offer a much more transparent and understandable, hence attractive, service to customers. Tariff averaging will thus always be present. However, there is a tendency for operators to introduce more differentiated tariff bands for various user groups and areas as they try to reduce the benefit of averaging to certain outlying high-cost users and implement profit-maximization strategies that differentiate between user groups based on what they can pay. (Strictly speaking this is a form of cross-subsidization because tariff variations are not based on cost, as is also the case when an operator's averaged tariffs are deliberately different from those of its competitors. These cross-subsidies do not distort competitive processes but rather are a part of them.) However, unless averaging is used as a means to cross-subsidize, the impact of this specific, narrow form of deaveraging is likely to affect only the most expensive rural users.

## **Cross-subsidization**

There are three main types of tariff cross-subsidization: within tariff elements; between tariff elements; and between basic and advanced services.

### **Cross-subsidization within tariff elements**

In a purely commercial and competitive context, tariff averaging may be considered as a form of cross-subsidization within a specific band, such as a local tariff rate, justified by all service providers on purely commercial grounds. However, tariff averaging is most often discussed as a specific instrument of cross-subsidization, going beyond what would be justified in a competitive context. By manipulating the number of averaged tariff bands and their size in monetary terms (tariff setting), very considerable cross-subsidization can be implemented.

In general, the following points apply to the three tariff elements (connection charges, rental fees, and usage tariffs):

- Connection charges are held to a single or a few levels, irrespective of the cost of deploying the network connection, so those expensive to connect are subsidized by others.
- Only one or a few levels of rental charges are applied (often differentiating between business and domestic users), irrespective of the volume of use or the cost of maintaining the line, so low-volume, high-maintenance customers are subsidized.
- There are usually only a small number of usage tariff rates, rising with distance and related to costs in relative, but not absolute, terms. In general, it is accepted that local tariffs are currently subsidized by long-distance, national, and international tariffs.

### *Effects on universal service*

Cross-subsidization within tariff elements is, traditionally, one of the main instruments of universal service for rendering services affordable to users, but rapid changes in technology and in the costs of different elements have complicated and somewhat blurred the picture. Virtually all countries with a liberalized environment have retained tariff averaging as a means of cross-subsidy. The main effects on universal service are as follows:

- Uniform connection fees imply a sometimes significant cross-subsidy for rural users, thus making it much easier for them to connect to the network.
- To the extent that rural lines need more maintenance, uniform rental tariffs also subsidize rural users and help them stay connected.
- Higher rental fees for business users than for domestic users subsidize the latter, making it easier for them to stay on the network, although networks are “dimensioned” to deal with business peak traffic, justifying a higher rental for business use.
- The fact that the overall level of usage of a line is not taken into account in the rental fee (and only partially in the usage tariffs) discriminates in favour of low-volume users.
- Relatively low usage tariffs for local calls discriminate in favour of domestic users and small local businesses (more so in urban than in rural areas because people in rural areas make more long-distance calls) and against larger businesses, especially international corporations. This allows domestic users and small local businesses to make more use of the telephone service.

Within these parameters, the effects do not discriminate between users who can afford the services and those who cannot, so some of the subsidy ends up with those who do not need it. However, the subsidies also favour the egalitarian principle of universality.

### *Comments*

1. Competition (or the anticipation of it) constrains the extent to which cross-subsidy by tariff averaging within tariff elements can be used as a means to implement universal service, because competition forces tariffs toward their costs. However, licence conditions and regulations are usually used to ensure that operators pursue universal-service aims.
2. The extent of cross-subsidy between, for instance, local and international services is extremely difficult to determine and has led to much debate. The issue, however, is unavoidable in competitive contexts because regulators have had to set tariffs both to prevent predatory pricing by

incumbent operators and to simulate the effects of competition where they are only weakly present. Tariff-setting formulae must thus be devised that are not directly based on competitive pressures. Furthermore, the cost of universal-service provision (that is, of extending the network beyond profitable users to currently loss-making users) must also be calculated so that it can be divided in some way between the different operators. Such a calculation must also deduct the economic benefits of universal service to the operator, such as the increased utility of the network derived from more users and economies of scale and scope. All of this increases the complexity of determining real cost.

Call-back services for international services in monopoly regimes can significantly endanger and reduce the extent of cross-subsidy between international-usage and local-usage tariffs because such services can exploit the difference between the cost of phoning from country A to country B and the cost of phoning from country B to country A, although many such services manage to avoid paying the full cost of their own operations.

Increasingly, international-service and national-service providers are being differentiated from local-service providers, which demands a far more transparent form of cross-subsidy (if any at all). It also introduces questions of interconnection charges, with operators effectively dividing usage tariffs between themselves according to some agreed formula. The Philippines is a case where international and national carriers have recently been in dispute over these charges.

Long waiting lists for services render uniform connection charges virtually meaningless.

Alternative networks, such as cellular mobile, are offering basic services but at much higher tariffs. In countries of Eastern Europe and in many developing countries, this in effect creates two systems of basic telephony and is a form of deaveraging by customer type (based on cost). Mobile systems undermine the usual tariff bands because the originating call can be from anywhere. In some areas, they are beginning to replace, instead of supplement, fixed systems, in which case they draw away high-paying customers, thus reducing the cross-subsidy. Fixed mobile systems in the future may also opt for very different tariffing strategies.

**Cross-subsidization between tariff elements**

Cross-subsidy can also occur between the three tariff elements: connection charges, rental fees, and usage tariffs. In general, some patterns in cross-subsidy have emerged. Although tariff setting was often originally cost based, the failure of tariffs to keep pace with changing costs has resulted in the following in developed countries:

- Connections are generally provided well below cost, overall.
- Rental charges do not cover the costs of network maintenance, overall.
- Usage charges generally yield far more than the marginal cost of service usage.

Thus, usage charges cross-subsidize rental and connection charges.

*Effects on universal service*

Cross-subsidy between tariff elements has the following main effects on universal service:

- It favours expansion of the network over more intensive use of the network, thus leading to a general increase in the level of universal service.
- It favours the retention of low-usage users, which also helps to maintain universal service.

This form of subsidization does, in a general way, benefit low-income groups that cannot afford to spend more on telephony.

*Comments*

1. Because the network provider in monopolies usually maintains the network and provides the services, the allocation of costs between these elements has been largely determined on a noncost basis. However, liberalization of networks and services changes this, so service providers tend to reduce this cross-subsidy by increasing connection charges and rental fees. However, it remains extremely difficult to accurately cost different services in a network environment with many large, indivisible elements when rapid technological change is introducing premature technical equipment

redundancy and writing down payback periods and organizational restructuring is affecting the cost basis.

2. By favouring network expansion, this cross-subsidy has clear medium- and long-term economic benefits to the network operators, especially in less-developed networks with major growth potential. It is thus the subject of regulation even in liberalized regimes. Liberalized regimes have therefore had to develop mechanisms to effect this cross-subsidization, to control its rate, and to allocate its cost among operators. Such regulation has in turn caused controversy over the means of valuing existing networks and over interconnection charges when the service provider is different from the network provider.

### **Cross-subsidization between basic and advanced services**

Tariffs on advanced services, such as leased lines, mobile service, and value-added services, can also be used to subsidize basic services. A case in point is leased lines: very high tariffs relative to costs have been levied in many European countries. However, the reverse seems to be the trend: advanced services are priced at marginal costs and fail to contribute to the basic existing network over which they are carried. This is probably because advanced services are more recent and have therefore tended to be introduced in a more liberalized environment. Where monopolies have been maintained on basic services (and even in cases of competition), basic services can be used to cross-subsidize more advanced services to make the latter more competitive in the lucrative and growing advanced-services market.

#### *Effects on universal service*

Advanced services are used almost exclusively by business, especially larger and multisite firms. Subsidization can operate in contradictory directions, depending on the cost of specific services and the tariffs charged. In some situations, the tariffs provide a general subsidy to smaller and domestic users of basic services. However, the trend seems to be in the opposite direction: users of basic services provide a general subsidy to business users. In either case, it is highly indiscriminate because the destination of the subsidy is undetermined.

#### *Comments*

1. Because many advanced services have been introduced in the context of at least partial liberalization, this form of tariff cross-subsidization has limited and diminishing relevance.

2. Where advanced services are provided in a competitive context and basic services are not, there is a real danger that monopoly-service customers (for instance, domestic and rural users) will be used to subsidize the competitive-service customers (mainly larger firms).

## APPENDIX C

# *UNIVERSAL SERVICE OR TELECOMMUNICATIONS FOR DEVELOPMENT?*

This appendix explores whether the term *universal service*, as generally employed, is adequate for the needs of current South African policy debates on development and telecommunications.

### **Universal service as a contested terrain**

The idea of *universal service* has a long and somewhat chequered history. In the early days of telecommunications, it gained currency as a description of the full interconnection of all telecommunications networks, an important issue when many incompatible networks were developing in different regions. Universal service, in this sense, won the day; indeed, the International Telecommunications Union and other organizations continue the work of implementing that victory.

Later on, universal service came to mean the provision of telephony to all who requested it, at affordable tariffs. It thus adopted a much higher normative profile and in some countries was set alongside great national drives to create widespread access to electrification, water, and other basic services. It was used in this way among a number of the less-developed parts of Europe where the growth in the importance of telecommunications was more synchronous with, rather than sequential to, that of other more basic services.

However, in the last decade or two, the term has entered a more ambiguous phase, an inevitable development of the great shift in the industry from government monopoly to privately owned, competitive supply. As indicated earlier, universal service has become something of a contested terrain, with each side of the industry using (or, according to the other, abusing) the term for its own ends.

The dispute is no longer about aims: the provision of basic service at affordable rates is acceptable to all. Rather, it is about defining what *provision*,



*basic*, and *affordable* should be, on the one hand, and the appropriate means to achieve it — state monopoly or private competition — on the other. These have been the clear dividing lines in recent debates, such as in the European Union.

The use of *universal service* in this struggle to control the future of the sector is unfortunate, because it limits its utility. Innocent use, focusing above all on the aim rather than the means, becomes virtually impossible: discussion is quickly polarized as those committed to one or other approach strive to detect dissenters or create converts.

There may thus be a case for avoiding or supplementing the term *universal service* as the debate on liberalization versus monopoly in South Africa gains pace. Those committed to universal service may become drawn into a debate and taking sides that should not necessarily be a central concern.

However, there are further, more compelling reasons to consider the replacement of the term with something a little broader.

### **Effective use in the Information Society**

The scope of universal service, traditionally covering only voice telephony, may be inadequate to cover a number of new possibilities arising in the context of the Information Society (this includes the information superhighway, the global information infrastructure, and the like). For instance, fax, e-mail, and on-line services have technical requirements that are different from those of voice telephony, especially with regard to acceptable line-noise levels and compression capabilities. Yet these new services are increasingly relevant to development, equally in rural and in urban areas.

More important than the technical issues, with universal voice-telephony service it may be safely assumed that with affordable access, the great majority of users can get on with reaping the benefits: they know why they must use the phone and can easily develop strategies that will yield economic or social gain. Such effective use cannot be taken for granted with these new services. Using them to maximum effect requires a different level and nature of support. Although voice telephony is relatively easily mastered, the use of fax and especially e-mail and networking activities require literacy; basic familiarity with computers; specific training in use; and higher expenditure for purchase, maintenance, and security of user equipment.

Thus, the provision of universal service must increasingly involve not simply affordable access but also support for effective use. “Affordable access, effective use” is the catch-phrase for universal service in the Information Society.

### Universal-service mechanisms

A further problem with the term *universal service* is that, in common usage, mechanisms set in place to achieve it are associated very narrowly with the telecommunications sector and, in particular, with regulatory measures. This is again because of the context in which the term recently regained common currency, that is, the global shift toward privatization and liberalization and hence the need for regulation to safeguard or support universal service.

Thus, an agency devoted solely to universal service would, in the language of most involved in telecommunications, be regarded as unnecessary duplication of regulatory activities, especially to those who do not perceive a conflict between simultaneously regulating for competition and regulating for universal service. To those not involved in telecommunications, the term remains somewhat ambiguous and ill understood.

The issue is not just a narrow association with the process of liberalization. It is that in the light of the previous discussion on effective use in the Information Society, several measures that go well beyond the confines of telecommunications, as conventionally defined, could be supported.

Such advanced use of communications brings universal service toward a more integrated approach to development — across all sectors and in all areas — and into a more intimate relationship with potential users at the local level. The mechanisms used to do this are certainly not usually associated with the functions of a regulatory body because they often involve innovative actions across a range of spheres, such as training, support, needs and sector analysis, and pilot projects. In most countries, such innovative approaches have been taken either directly by the government (such as in Korea) or by an operator in state ownership (such as in Brazil). Where competition has been introduced, the regulator does not usually carry out these functions.

Yet the term *universal service* can remain in many minds the preserve of regulators and conventional monopoly operators.

### Universal access

A proposed alternative to *universal services* is *universal access*, referring to reasonable access to a telephone for all, which might mean, for instance, a public phone within a radius of a few kilometres, rather than on everyone's premises. This does have certain advantages. In many countries with poorly developed networks, it offers a more realistic short-term goal. Furthermore, it can focus immediate efforts toward the most needy and away from those who might most cheaply be furnished with an individual line in an effort to boost teledensity. For

instance, it may be the case that premises without a telephone are far more numerous in urban than in rural areas. Because urban areas are cheaper to connect up, nationally teledensity can be boosted most speedily by offering phones there. A focus on universal access, on the other hand, emphasizes that most people in urban areas already have reasonable access to a phone. Choosing to maximize the number of new connections for a given investment might thus yield few new benefits: the urban dweller may get more or less equal benefit from using an existing local public phone and sharing with a neighbour. A rural dweller, by contrast, may have no such access to a public phone or a neighbour's phone. The cost of establishing a connection to the rural home, even before adding monthly tariffs or usage charges, may on its own be prohibitive.

Thus, although not offering the same per capita increase in teledensity for the investment, expenditure on providing rural access via a public phone or public centres may offer considerably greater benefits.

Yet, for all its benefits, *universal access* does have shortcomings. Despite its improved focus on development, in some ways it can be interpreted as a watered-down version of universal service because it demands a far lower level of investment overall. One should therefore be wary of substituting *universal access* for *universal service*.

Furthermore, the problems mentioned earlier with *universal service* are not solved by the substitution of *universal access*. The latter term also fails to encompass the gamut of measures and mechanisms that ensure that telecommunications contributes in an integrated way to development. Thus *universal access* is probably best used to refer to one strand, or phase, in achieving *universal service*.

## Conclusion

Contrasting *universal access* and *universal service* highlights how inadequate the latter term currently is (especially when equated with teledensity) at capturing the differential economic and development benefits of telephony for different user groups. We have also seen that *universal service* fails to embrace the broader range of activities and actions that increasingly become a tool for development in the Information Society, and the term is also somewhat compromised in ongoing debates over the virtues of competing industry regimes.

There is thus a case for using another term in the discussion for the Universal Service Agency in South Africa. The problem is finding one that fits. Certainly, it should directly address the broad development issue. Terms such as *telecommunications for development*, *universal access for development*, and *accessible telecommunications for development* might therefore be considered.

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