# **Chapter XIV**

### FINANCING NETWORK INVESTMENT

## Contents

- 14.1 Why invest?
- 14.2 Investment indicators
  - 14.2.1 Measuring investment
  - 14.2.2 Investment comparisons

# 14.3 Traditional forms of network financing

- 14.3.1 Internally-generated revenues
- 14.3.2 Government lending
- 14.3.3 Multilateral development agencies
- 14.3.4 Supplier credits and bilateral aid
- 14.3.5 Accounting rate settlement payments
- 14.4 Non-traditional forms of network financing
  - 14.4.1 Private sector participation
  - 14.4.2 Private financing
  - 14.4.3 Concessions
- 14.5 How to do it

### **Chapter XIV**

#### FINANCING NETWORK INVESTMENT

#### Purpose of this chapter

Guidelines are provided, in particular for developing countries, on the information which needs to be collected and monitored when embarking on a major investment programme. This information is in the form of investment indicators which are required to assess requirements and formulate a business plan. These indicators are reviewed and examples for low-income countries are given.

In addition, the traditional, and some non-traditional, methods of financing are described - and a reminder given that successful investment can only be supported by a atriff structure which gives sufficient revenue per subscriber (i.e. a cost-related structure as discussed in Chapter 13).

As far as te strategy for growth is concerned it is concluded that it is simply more investment.

## Outputs to be obtained

- Definition of all investment indicators given in this chapter;
- Business plan to support the future investment programme.

### **Inputs required**

- Tariff scenarios for future operations;
- Past, present and future financial analyses, in particular cash flow statements.

#### **Chapter XIV**

### FINANCING NETWORK INVESTMENT

### 14.1 Why invest?

For most of its history, the public telecommunications sector has been characterised by a surplus of demand over supply. The number of people wanting access to the telephone service has been greater than the number of lines available, and the number of subscribers wanting to make calls at certain times of day has exceeded the capacity of the network to handle those calls. Thus the simplest answer to the question "why invest?" is that new investment is necessary to meet the **unsatisfied demand** for telephone service. Across the world, even though most of the advanced industrialised nations can meet new demands for telephone lines within a few weeks, nevertheless the total "official" waiting list is still close to 50 million applicants, and the average waiting time is almost two years (Figure 14.1).

But even where basic demand for telephone service can be met, there is an ever growing demand for **new** services. Historically, most of the demand for new services has come from the business community especially for data communications, fax, mobile communications, private networks and value added services. But increasingly it is residential users who are also demanding new services, especially now that televisions, mobile phones and personal computers have become mass market products in industrialised countries. Furthermore, many of the new services demand **high performance networks**, based on digital switching and high bandwidth transmission. With the increasingly short product life cycles that characterise the telecommunications industry, the task of modernising and upgrading the basic network is seemingly never-ending.

Investment to respond to demand, to develop new services and to modernise the network have long been a part of the traditional operations of the Public Telecommunication Operator (PTO). But in the new environment there is yet another reason to invest, namely to **keep ahead of the competition**. A declining number of PTOs enjoy a monopoly in their own national market, and for international services a competitive marketplace is now well established. Any PTO which does not invest will soon find that other new market entrants will invest in their place, and while it may be possible to hold on to market share in the short-term without an aggressive investment strategy, it is certainly not possible in the long term.

This chapter looks at the broad issue of financing network investment and attempts to answer the question: who pays? In the long run, almost all network investment is paid for by the user. But few PTOs are able to finance network investment programmes purely from internal revenue generation, and certainly not in those countries where high rates of network growth (greater than 10 per cent per year) are necessary to keep up with demand. Instead, network investment is usually financed on the basis of potential future users. There is a myriad of schemes available for converting potential future cash flow into available funds for current investment. Some are very simple, others are ingenious. This chapter reviews some of the main techniques which have been used in different countries and analyses why they have been successful. The chapter begins with a review of investment indicators (14.2) which are necessary in assessing requirements and forming a business plan. This is followed by a presentation of traditional (14.3) and non-traditional (14.4) forms of financing. Finally the chapter concludes with a discussion on "how to do it" (14.5) with a specific focus on the needs of PTOs in the Least Developed Countries.

#### Figure 14.1: Long wait

World waiting list 1984-1992 and waiting time for main line by income group, 1992



Source: ITU/BDT Telecommunication Indicator Database.

### Figure 14.2: Telecommunication capital spending

Investment in telecommunications, 1983-92 and distribution by income group, 1992



Note: Investment figures are based on constant prices, corrected for consumer price inflation, and expressed in 1992 US\$ exchange rates. Income groups based on World Bank definitions of average 1991 GDP per capita. Low income = less than US\$640 per year. Lower-middle income = US\$641 - US\$2'500 per year. Upper middle income = US\$2'501 - US\$10'000 per year

High income = greater than US\$10'000 per year.

Source: ITU.

### 14.2 Investment indicators

### 14.2.1 Measuring investment

For any PTO planning a programme of network investment, there are several key indicators which need to be monitored. If the PTO is planning to raise capital to finance the investment programme from outside its own resources, then it will almost certainly need to be able to provide this data to the lending institution in order to produce a credible business plan. A good track record in monitoring the sources and application of funds is essential in attracting fresh investment.

Perhaps the most self-evident indicator to be monitored is the **total level of investment**, usually measured in annual terms. Across the world as a whole, the total level of investment in 1992 was some US\$125 billion, a figure which has grown by around 2 per cent per year over the last decade in constant values corrected for inflation (Figure 14.2). However, the distribution of this investment is far from being equitable with just 6 per cent being disbursed in the low income countries, despite the fact that they account for around 14 per cent of total demand for basic telecommunication service (defined as, new lines added during year plus official waiting list for unmet demand).

The term investment, also referred to as *capital expenditure*, implies the expenditure associated with acquiring the ownership of property (including intellectual and non-tangible property such as computer software) and plant. These include expenditure on initial installations and on additions to existing installations where the usage is expected to be over an extended period of time. The total figure can alternatively be specified more precisely, as:

- Total annual investment in telecommunication for land and buildings. The *annual* investment, including that for acquiring property and plant
- **Total annual investment in telecommunication excluding land and buildings.** The annual investment for acquiring plant (e.g., switching equipment, transmission equipment, office machinery, motor vehicles) but not including land or buildings.
- Total annual investment in telephone switching equipment. The annual investment for telephone switching equipment such as local, national (trunk) and international exchanges, as a subset of the category above.

The measurement of investment is complicated by the fact that accounting practices vary over time and between countries. The former problem can be alleviated by efforts to reconcile past investment figures with current practices. However the latter problem is more serious and distorts international comparisons of investment. For example:

- Some countries exclude land and buildings from their total level of investment;
- Some countries exclude investment expenditures below a certain value (e.g., below US\$1000) and count these instead as current account expenditures. However, the threshold value varies significantly between operators;
- Some countries capitalise the labour costs involved in new investment projects (e.g. construction, installation, maintenance). On average, this adds around 15 per cent or more to the total value of investment reported in those countries, such as Japan, which follow this practice.
- Some countries include research and development expenditure as part of their investment figure. It is better to count R&D and associated expenditures as a separate item where possible.

#### 14.2.2 Investment comparisons

Despite these methodological difficulties associated with the measurement of investment, it is clear that there are still major differences in the level of investment between countries. Comparisons of investment performance can help to highlight the level of commitment to improving the telecommunications infrastructure, especially where there is still monopoly service provision, and the likelihood of success. One of the most useful indicators is **investment as a percentage of revenue**. This might be defined as the total annual investment in telecommunications, divided by the total annual revenue from telecommunications-related activities, expressed as a percentage.

Over the last five years, the average level of network investment as a percentage of revenue has been around 30 per cent. During this period, the global network has sustained an annual growth rate of just over 5 per cent per year. For developing countries which are trying to bridge the telecommunication development gap between themselves and the advanced industrialised nations, this level of growth would not be adequate. They would be looking for a growth rate between two and three times the global average. The evidence presented in Figure 14.3 suggests that a number of developing countries have succeeded in doing this, but it has been necessary to sustain a correspondingly high level of network investment. An increase in the level of investment as a percentage of revenue by 10 percentage points would correspond to an increase in annual growth rate of 1.5 percentage points per year. Furthermore, the relationship suggests that to sustain a network growth rate of 10 per cent per year, it would be necessary to sustain a level of investment equivalent to at least 64 per cent of annual revenue. This level is certainly achievable. As Figure 14.4 shows, several of the countries in Latin America have recently boosted investment, following sector reform and privatisation, and this has had an immediate impact on network growth. In Chile for instance, since privatisation in 1988/89, the level of investment has been greater than 60 per cent of revenue and this exerted a strong push towards higher network growth rates. In Argentina, the date of privatisation is more recent (1991/92) but the effect is equally striking.

#### Figure 14.3: Spend to grow

Relationship between investment as a percentage of revenue and network growth, 1988-92



*Note:* Analysis based on 113 countries which together constitute around 98 per cent of total network investment, 1988-92 *Source:* ITU/BDT World Telecommunication Indicator database.

#### Box 14.1: The cost of a telephone line

An estimate of the cost of adding a telephone line is important for determining how much investment will be required in the telephone network. The figure generally used by the industry is US\$ 1'500 per line. This figure is assumed to include the cost of the local exchange to which the line will be connected; investment in the transmission network to connect the local exchange to long-distance and international exchanges; purchase, lease and construction costs of supporting land and buildings; and the labour component of laying the lines.

One danger of an average figure is that it doesn't reflect different costs across countries due to relative wage rates; equipment prices; tariffs; transport costs; or land values. For example, labour costs tend to be lower in developing countries than developed ones; on the other hand, higher tariffs for imported equipment or poor procurement practices may result in higher equipment prices for developing countries.

A problem with determining an average price per line is that a breakdown of costs is difficult to obtain. Most countries do not provide an itemised accounting of capital expenditure, so it is difficult to separate telephone network investment from network modernisation (e.g., replacement of old exchanges) or investment in other services such as cellular or data networks.

A rough measurement for determining the average investment per line is to take total telecommunications investment for a group of countries and divide it by the number of lines added. This includes investment that might have been made in other areas, but it is assumed that in developing countries at least, because the installed base of telephone lines is so low, most investment will be made there. Interestingly enough, when this calculation is made for low- and middle-income countries, the average is US\$ 1'500. The figure rises for upper- and high-income economies (to US\$ 2'500 and US\$ 7'000 respectively); this is to be expected since most investment in wealthier countries is in modernisation and new services rather than network expansion.

Another way of approaching the problem is to analyse announced equipment contracts. A review of several large purchases made by developing countries in the last few years results in an average figure of US\$ 500 per line; this includes local, long-distance and international exchange and transmission equipment, but does not include the local land and building or labour component. At US\$ 1'500 per line, this leaves two-thirds of the costs to the local component. Considering that wages and land costs tend to be lower in developing countries, this estimate seems reasonable. A review of loans from development banks shows an average investment of US\$ 700 per line, or less than half the average figure.

More research is needed to explain the large inter-regional and within region differences. For example, why is average investment per line over US\$ 6'000 in sub-Saharan Africa but less than US\$ 1'500 in Central and Eastern Europe? Why are investment costs per line more than twice as much in India than in China? A better understanding of telecommunications investment will lead to improvements in efficiency resulting in more lines for less money.



#### Box Figure 14.1: Investment per main line added, 1992

### Figure 14.4: Privatise, spend and grow

Growth in main lines, and change in investment as a percentage of revenue in Argentina and Chile, 1982-92



A second indicator which has great relevance for countries undertaking a major round of network investment is **average investment cost per new line added**. This derived series is calculated by estimating the total value of capital investment during a certain period and then dividing by the number of new lines added during the same period. This methodology has many imperfections: for instance, it does not make accommodation for that portion of network investment which is spent on modernising or maintaining the network, or in adding new services. Nevertheless, it does serve as a good rule of thumb for the general *efficiency* of the investment process. As a general rule of thumb, if a country is paying more than US\$1'500 per new network connection, then it is paying too much. Box 14.1 reviews the evidence and explains why the average level of investment per new line added varies so substantially between countries.

A third indicator of network investment is **investment per line**. This is calculated by dividing the total value of investment by the total number of lines installed (i.e. not just the number of new lines added in the last year). As such, the indicator shows the investment intensity of the network using the absolute size of the network as a base. The countries which score highest on this indicator are mainly the German-speaking OECD nations, such as Germany, Austria and Switzerland. Closely related to this is the level of **investment per capita** which is calculated by dividing the total value of investment by the total number of inhabitants in the country. Again this indicator is biased towards those networks which have already achieved a high level of penetration. Over the world as a whole, the average is around US\$25 per inhabitant, but in the low income countries it is below US\$3 per inhabitant per year.

A fifth investment indicator of note here is **investment as a percentage of Gross Fixed Capital Formation** (**GFCF**). This is calculated by dividing the total level of investment in telecommunications by the total investment within the economy in all forms of capital expenditure. This indicates the level of commitment to telecommunications in competition for funds with other capital investment projects such as roads, railways, housing etc. At a global level, telecommunications contributes around 2.6 per cent of GFCF, but in the low income countries it is lower at 1.8 per cent, suggesting that spending projects more closely related with basic human development -- such as clean water, sanitation, building schools and hospitals -- take priority.

Investment indicators are most useful when they are used to make comparisons, either comparisons across time (i.e. to chart the progress of a particular PTO or economy) or between countries. Certainly potential investors make such comparisons when choosing where to invest their money, so it is logical that PTO managers and regulators should also do so. Among the low income countries for which data are available, the average level of investment as a percentage of revenue is around 61 per cent. However, only 8 out of the 33 countries for which data is available exceed this figure which suggests a skewed distribution. Overall the low income countries invested some US\$6.7 billion in 1992, of which just under half was invested in China.

Table 14.1: Selected investment indicators for low income countries

	Total	Per inhab.	Lines added	Per main line	As a %	As a %
	(M US\$)	(US\$)	(k)	added (US\$)	of revenue	of $GFCF$
	1992	1992	1991-92	1992	1992	1991
Bangladesh	44.8	0.4	6.5	6,879	32.0	1.8
Benin	21.2	4.3	0.7	28,282	65.1	0.3
Burkina Faso	19.3	2.0	1.9	9,951	41.2	2.1
Burundi	0.8	0.1	2.8	295	5.9	0.5
Central African Rep.	4.6	1.5	0.4	12,763	40.4	3.3
Chad	2.0	0.3	0.1	25,936	14.4	7.3
China	2,946.7	2.5	3,018.5	976	76.3	1.2
Comoros	1.0	1.7	0.1	11,847	21.7	1.8
Egypt	294.3	5.3	246.6	1,193	67.0	2.2
Ethiopia	7.2	0.1	7.4	971	18.7	2.3
Gambia	12.0	12.7	4.0	3,022	74.6	10.8
Ghana	8.6	0.6	2.4	3,624	17.3	0.8
Honduras	38.6	7.6	10.3	3,739	40.4	3.6
India	1,495.1	1.8	735.2	2,034	64.2	2.7
Indonesia	981.4	5.3	239.4	4,100	67.0	1.3
Kenya	73.2	2.7	7.4	9,837	33.5	8.2
Lesotho	4.6	2.5	0.4	11,652	34.6	0.6
Madagascar	7.1	0.6	0.3	25,593	34.5	0.4
Malawi	22.7	2.2	2.9	7,742	52.4	4.5
Mali	14.6	1.5	0.4	39,206	39.6	1.4
Mauritania	1.4	0.7	0.4	3,817	5.4	1.1
Mozambique	4.6	0.3	3.3	1,420	7.5	2.4
Myanmar	8.1	0.2	5.4	1,497	13.0	
Nepal	7.3	0.4	3.6	2,031	22.8	3.5
Nicaragua	42.5	10.3	4.2	10,004	84.7	3.0
Niger	0.7	0.1	0.4	1,812	2.8	0.8
Nigeria	93.0	0.8	26.8	3,473	23.8	4.2
Pakistan	276.6	2.4	127.5	2,170	41.4	3.4
Rwanda	7.8	1.1	1.0	7,476	48.1	2.3
São Tomé & Principe	1.0	8.5	0.1	10,468	24.8	13.9
Solomon Islands	1.3	4.1	0.6	2,138	20.1	2.2
Sri Lanka	8.9	0.5	9.7	915	6.8	0.9
Tanzania	14.2	0.5	4.9	2,879	23.1	1.1
Togo	8.5	2.3	4.6	1,846	28.3	4.8
Viet Nam	88.3	1.3	50.0	1,766	128.0	6.4
Yemen	44.0	3.4	12.4	3,536	35.9	2.4
Zambia	15.4	1.8	6.9	2,214	11.9	7.1
Zimbabwe	51.4	4.9	1.0	52,129	49.6	2.9
Low Income	6,700.7	2.2	4,550.5	1,473	61.4	1.8

Note:Low income defined as countries with a GDP per capita below US\$640 per year.Source:ITU/BDT World Telecommunication Indicator Database.

#### 14.3 Traditional forms of network financing

### 14.3.1 Internally-generated revenues

The most significant form of network financing has traditionally been internally generated funds. Ultimately, one could argue that internal generation of funds is the *only* form of network financing because most other schemes are based upon the repayment of funds at some time in the future, either in the short-term or in the long-term. According to estimates from The World Bank, in the 1980s, around 60 per cent of the investment needs of the developing countries were met by internal revenue generation, with the rest coming from bilateral and commercial credits (25%), governments (5%), private sector financing (5%) and multilateral lending institutions (5%). The level of funds generated from PTO operations depends crucially on the tariff structure in force (see previous chapter). In many developing countries, tariffs are kept artificially low for social or political reasons. In other countries, the rise in tariffs is insufficient to keep pace with the rising level of inflation. In both these instances, the tariff structure would prove to be an inefficient mechanism for raising revenue and investment planning would be held back. Thus, it is often the case that a process of tariff reform must precede any major new round of investment, both to ensure that sufficient funds are generated internally to repay the investment, and to bolster the credibility of the PTO when seeking external funding.

Internally-generated funds come from two main sources:

- **Retained earnings**, which is the margin left over on operating surplus once all money due to third parties (tax, transfer to government treasury, payment of dividends to shareholders, payment of accounting rate settlements, repayment of interest on loans, etc.) has been paid;
- Provisions for **depreciation**, which may be defined as the expected devaluation of capital assets insofar as this is regarded as an item of current expenditure. It covers the financial charges made in the year for the loss of value of installed equipment. It is normally calculated on hypotheses based on the useful life of the different categories of equipment.

Most developing country PTOs continue to enjoy a monopoly and therefore, given an appropriate tariff structure, the generation of sufficient retained earnings to sustain a major investment programme should not prove to be a problem. Indeed, profitability among PTOs in developing countries often runs at a much higher level than among developed country PTOs which operate in competitive environments. As the diagram in Figure 13.6 (Chapter 13) shows, the average level of net profitability of PTOs in low income countries is about 31 per cent of revenue compared with a global average for the public telecommunication services sector of around 10 per cent. As pointed out in Chapter 13, one of the reasons for this high level of profitability is that some developing countries receive a high proportion of their income in settlement payments which incur almost no costs to the operator. However, this money is often siphoned off by the finance ministry, because it is usually paid in hard currency, and is therefore not available for reinvestment.

Depreciation can also be a major source of revenue for investment. On average, in the telecommunications sector, depreciation cycles have become shorter over time reflecting the rapid pace of technological change. Depreciation cycles are typically 5-7 years for switching equipment and 10-15 years for transmission. Generally speaking, the faster the depreciation cycle, the more money will be available for re-investment, though this will depend critically on the standard accounting practices in the country concerned.

# 14.3.2 Government lending

Historically, governments have played an important role in financing the development of the public telecommunications infrastructure, especially in those countries where the PTO is publicly owned. Indeed, in some countries where there is no clear separation between the accounts of the PTO and the accounts of the State, it could be argued that *all* telecommunications investment comes from the State. In practice, however, financial transfers from the PTO to the national treasury far outweigh transfers in the opposite direction, so that when the State is credited with financing telecommunications investment, what it actually means is that the State is agreeing to forego some part of the taxation or treasury transfer that would normally be due. State aid is diminishing as governments are becoming aware that telecommunications is a highly profitable business. Where State aid is given, it is usually in the form of loan guarantees or money to finance specific projects of specific social or technological interest, for instance regional development grants or research and development funds. An example of the latter is the French State financing of the minitel project during the 1980s.

## 14.3.3 Multilateral development agencies

Historically, the multilateral development agencies have played a major role in funding telecommunications investment projects in developing countries because telecommunications is perceived to be a vital part of the national infrastructure and because there are often telecommunications components in wider schemes, for instance for integrated rural development, or transport/energy/water infrastructure construction projects. The actual value of multilateral lending (around 5 per cent of total investment spending in developing countries) is actually quite modest, but its importance is much greater than this because funds from multilateral development agencies can be used as leverage to raise other funds: for instance from government, from domestic banks and from foreign investors. Loans from the development agencies have several benefits. They are usually offered with favourable terms such as low interest rates and long repayment periods. They are often offered in foreign currency and may be the only large source of credit in those countries without well-developed financial markets and limited funds for capital investment. Furthermore, in individual countries the percentage can be much higher. In Indonesia, for instance, lending from the multilateral development agencies accounted for 25 per cent of total telecommunication investment over the last decade.

The major lending institutions are:

- African Development Bank (AfDB)
- Asian Development Bank (AsDB)
- European Bank for Reconstruction and Development (EBRD)
- European Investment Bank (EIB)

- Inter-American Development Bank (IDB)
- International Bank for Reconstruction and Development (IBRD) -- The World Bank.

These six agencies approved total loans for all sectors of US\$ 389 billion from 1982-93, and annual lending has been growing by some 8.8 per cent per year. During this period, some US\$ 17 billion (4.4 per cent of total loans) was allocated to telecommunication project lending. However, this figure is grossly distorted by the European Investment Bank (EIB) which loaned US\$ 12.6 billion or almost a quarter of the total loans for telecommunications during this period. Of that amount, over US\$ 12 billion was for telecommunications in developed western European countries and the remaining US\$ 546 million was for telecommunication in developing countries. If EIB loans to western Europe are excluded, then the amount loaned to developing countries over the period amounted to US\$ 5 billion or around 1.7 per cent of total lending.

# Figure 14.5. Trends in multilateral telecommunication lending

*Telecommunication lending by agency and total telecommunication lending, 1983-92* 



*Note:* Not including EIB telecommunication loans to Western Europe. *Source:* ITU/BDT Telecommunication Project Database.

## Figure 14.6. Who gets most?

Multilateral lending by region and by borrower, 1983-92



## Figure 14.7 Japanese telecommunications assistance

Japanese government bi-lateral telecommunications grants and loans for developing countries, 1983-92





Further details of individual projects can be obtained in an ITU report entitled "Multilateral lending for telecommunications, 1983-92" published in 1994.

### 14.3.4 Supplier credits and bilateral aid

One of the major reasons why developing countries invest relatively little in telecommunications in comparison to the demand for services is because of currency shortages, particularly for convertible, hard currency, such as US dollars. One of the traditional ways around this problems has been for equipment manufacturers to extend credit facilities either directly or, more often, though tied aid associated with national aid programmes. Countries with leading telecommunications manufacturers, such as Sweden, Canada, Netherlands, USA or Japan, often work closely with their respective aid agencies to develop attractive schemes for lease or rent of equipment which they will eventually purchase. The advantage for the developing countries of this type of scheme is that it enables them to reduce the hard currency component of equipment purchase deals. Effectively, the supplier is taking on the depreciation payments rather than the customer. The disadvantage is that such deals may tie them to one supplier who may invoke exclusivity clauses and may make considerable additional revenues through "add-on" contracts, for instance for maintenance, training, consultancy, expansion etc. Many manufacturers are willing to make very attractive initial deals in order to break into a specific national market. Estimates from the World Bank show that commercial and bilateral credits supplied up to 25 per cent of total telecommunications investment requirements in developing countries during the 1980s. However, the evidence seems to indicate that this percentage is now declining.

#### 14.3.5 Accounting rate settlement payments

As noted in the previous chapter, one of the traditional forms by which national infrastructure development has been financed has been through international telephone traffic. This procedure works in two ways:

- By a direct cross-subsidy from revenues raised from local citizens for the charge of international telephone calls. Historically, international calls have been priced at such a level as to provide a healthy margin to cover loss-making or break-even activities in the local loop;
- By an indirect cross-subsidy through the accounting rate process. Because international calls are normally a jointly-provided facility, offered by two national operators, the country which makes more outgoing calls than it receives from its partners will usually pay a corresponding fee in compensation, known as the accounting rate settlement payment (see Chapter 13). In some countries, these net inward settlement payments can constitute a considerable proportion of overall income. In Latin America and the Caribbean, for instance, settlement payments from just one partner country, the United States amount to some US\$2.4 billion, and contribute more than 20 per cent of revenues for a number of countries. Indeed, for two countries, El Salvador and Jamaica, US payments provide more than half of total telecommunication revenues.

While settlement payments undoubtedly help with infrastructure development, it would be a mistake for any developing country to *rely upon* this source of income, for a number of reasons:

• Accounting rates are based on bilateral rates agreed between the two operators. Those countries which sustain deficits on net outward payments, such as the USA, Australia or Sweden, are putting pressure on

the calling partners to reduce accounting rates in line with the reduction in cost for international service. This will have the effect of reducing the level of payments.

- Settlement payments can easily become net outward payments rather than net inward payments, for instance in cases where local citizens start making more calls than they receive. PTOs which maintain international tariffs at an artificially high rate, or which take other steps to block or suppress outgoing calls, run the risk of damaging national economic competitiveness and therefore destroying their future customer base.
- As the international telecommunications market is increasingly opened up to competition, it is clear that the system of international accounting rates is being by-passed, for instance by alternative systems based on sender-keeps-all, roaming agreements, facilities leasing agreements, and interconnection agreements, as well as new forms of billing (e.g. call-back services, home country direct, or calling card services).

Rather than relying upon accounting rate settlement payments therefore, a better strategy would be to develop alternative sources of network financing which will be more reliable in the long term. This is the subject of the next section.

Economy		Telecom revenues, in US\$M, 1992	US payments as settlement charges in US\$M, 1992	Settlement payments as % of telecom revenues	
Belize		28.6	10.8	37.5	
Ecuador		212.1	58.7	27.7	
El Salvador		121.8	70.5	57.8	
Guatemala		166.3	61.4	36.9	
Guyana	a)	24.9	12.0	48.2	
Honduras		95.6	40.7	42.6	
Jamaica		169.4	96.3	56.8	
Nicaragua		50.2	20.2	40.3	
S. Lucia	a)	11.0	3.2	29.2	
Trinidad		158.8	43.2	27.2	
Americas region b)		32'159.3	2'353.9	6.7	

Table 14.2 United States settlement charge payments to selected countries in the Americas Region, 1992

*Note:* Table shows selected countries with settlement payments from United States in excess of 20 per cent of revenues. a) 1991. b) 31 countries included in the Americas regional total.

Source: ITU, FCC Common Carrier Statistics Yearbook.

## 14.4 Non-traditional forms of network financing

### 14.4.1 Private sector participation

According to figures from The World Bank, during the 1980s private sector investment provided just 5 per cent of overall funding for telecommunication investment projects in developing countries with the rest coming from internally-generated revenues (60 per cent), bilateral and commercial credits (25%), governments (5%) and multilateral lending institutions (5%). In the early 1990s the picture is quite different. The spread of privatisation programmes to developing countries, the issue of new operator licences, particularly for mobile communications, and a relaxation on the restrictions on borrowing by state-owned enterprises have all contributed to a rise in the contribution of the private sector to some 40 per cent of total investment requirements. Available evidence seems to suggest it will rise even further.

It is now clear that the overly restrictive market structures of the past in which the state has had a monopoly over the provision of telecommunication services have unwittingly acted as a bottleneck in preventing the free flow of capital investment to meet the demand for basic service provision. Nowhere is this more clearly illustrated than in Latin America (Figure 14.4). Since privatisation in Chile in 1988/9 and in Argentina in 1991/2, there has been an unparalleled

flow of private investment funds into telecommunications and this is reflected in an acceleration in main-line growth. Until recently, most of this new growth has been channelled via the public telecommunications operators in the region, but now it is increasingly going to the mobile communications operators who are often new market entrants based around consortia of local and foreign investors. In Mexico, for instance, at the start of 1994 there were some 385'000 cellular subscribers, up from 170'000 two years earlier, while in Brazil there were 180'000 up from just 30'000 one year earlier. These rates of growth would be astonishing even in an advanced industrialised nation. What they show is that there is no shortage of demand for telecommunication services and, where the opportunities are right, there is no real shortage of supply of cash for investment.

Over the last decade, there have been more than 15 privatisations of former state-owned enterprises in the telecommunications sector world-wide and at least a further 30 are planned in the next five years. The trend, which began in Europe and Japan, has now spread more widely through the Asia-Pacific region and Latin America.

Privatisation in itself does not necessarily imply that there will be an increase in the availability of funds for investment. However, in virtually every case recorded so far, this has been the actual outcome. Privatisation can provide funds for investment in a number of different ways:

- Through a **share offering**, by which money is raised based on the sale of assets by the government. In some cases, the government may decide to keep the money raised or to use it for some other non-telecom related activity. However, if the government is sufficiently committed to reforming and improving the supply of telecommunication services, it will use the money raised for telecommunications investment;
- Through a **debt-release scheme**, whereby the government, in preparing the operator for privatisation, will agree to release the new operator from some of its debt burden, usually in return for a commitment that the new owners will invest a certain amount in new telecommunication infrastructure.
- Through a **debt-for-equity exchange**, whereby the creditors of the privatised operators, such as banks, the government, or the multilateral development agencies will agree to accept shares in the new company in return for release of debt;
- Through a sale to a **strategic partner**, often but not always a foreign PTO, who will agree be given the opportunity to buy a share in the new company, generally a minority share, in return for a commitment to invest in new infrastructure;
- Through the **hiving-off or sale of certain support activities** (e.g. installation and maintenance, catering, billing) not involving the sale of the entire company, in order to raise capital for investment.

All the options listed above involve some form of sale of the PTO, or part of its activities. However, private sector participation can also be encouraged in other ways, for instance:

- through a management contract (e.g., Cable & Wireless in Botswana);
- through a joint venture to develop a particular technology or to enter a particular market (e.g. RomTelecom's joint venture with Telefónica of Spain to develop cellular radio services in Romania)
- through the award of a mobile license to a privately-owned contractor (e.g., Millicom in Ghana);
- through the issue of Build-Operate-Transfer concessions (e.g., Shinawatra Group in Thailand);
- by permitting local initiatives (e.g., community enterprises in Poland);
- by licensing competitors in the main fixed link network (e.g., Dacom for international services in the Republic of Korea).

Some or all of these different projects may be undertaken at the same time as privatisation, or they can be used as an alternative means of introducing private sector participation into the national telecommunications industry.

### Table 14.3. Who's privatising?

Major privatisations of telecommunication operators, 1983-93

Country	Company	Initial	Date	Price	%	Comments
		% sold		(US\$m)	private	
Argentina	Telefónica Argentina	100	1990	482	100	Private sale to COINTEL consortium (consisting of Telefónica de España, Citicorp, and Techint-60%). For employees and co-operatives (15%). Public share offerings (25%).
Argentina	Telecom Argentina	60	1990	462	100	Private sale to consortium (comprised of . STET, France Télécom, JP Morgan, and a group of Argentine investors).
Canada	Teleglobe	100	1987	369	100	Initial sale to Memotec; now Teleglobe Inc.
Chile*	Compañía de Teléfonos de Chile (CTC)	50	1988	n.a.	100	Original private sale to Bond Corporation; later acquired by Telefónica de España.
Chile	Empresa Nacional de Telecomunicaciones (ENTEL)	100	1988	n.a.	100	Sold to Telefónica de España (20%), Chase Manhattan Bank (10%), and the remainder held by employees, pension funds, and smaller private investors.
Hungary	Hungarian Telecommunications Company (MATAV)	30	1993	875	30	Private sale to the Magyarcom Consortium (composed of DB Telekom and Ameritech).
Japan	NTT	12.5	1986	13850	35	Shares sold in three tranches through domestic public offerings. The second and third offerings were held in 1987 and 1988. The total net value of the sale was almost US\$ 70.5 billion.
Korea	Korea Telecom	2	1993	200	2	10% was offered in the fall of 1993 but only 20% of the 10% was bought after two auctions. Shares were sold to domestic non-institutional investors.
Latvia	Lattelkom	49	1993		49	Private sale to Cable & Wireless and Telekom Finland.
Malaysia	Telekom Malaysia Berhad	24	1990	2350	25	Shares sold through a domestic public offering on Kuala Lumpur Stock Exchange.
Mexico*	Teléfonos de México (TELMEX)	20	1990	1757	98	Private sale to consortium comprised of Grupo Carso, Southwestern Bell, and France Télécom. Sold in three tranches (1990, 1991, 1992). Combined offerings in Mexico and other countries. Mexican Government retains 1.6%.
New Zealand	Telecom Corporation of New Zealand Ltd.	100	1990	2500	100	Private sale to Ameritech & Bell Atlantic.
Puerto Rico	Telefónica Larga Distancia de Puerto Rico	80	1992	142		Private sale to Telefónica de España.
Singapore	Singapore Telecom	11	1993	2500	11	Shares sold on Singapore Stock Exchange.
United Kingdom	C&W	49	1981	452	100	Shares sold by tender in two tranches. Second tranche sold in 1983. Net value of the total sale amounted to US\$ 868 million.
United Kingdom	BT	51	1984	5187	100	Shares sold by tender in three tranches. Second and third offerings held in 1991 and 1993. Net value of total sale amounted to around US\$10 bn
Venezuela	Compañía de Teléfonos de Venezuela (CANTV)	40	1991	1900	40	Private sale to Venworld consortium (GTE, AT&T, Telefónica de España, and two Venezuelan partners).

Source: ITU

Note: \* Prior to privatisation some percentage was privately held.

#### Box 14.2: Sale of state-owned telecommunication enterprises

There are several methods that can be used in selling a state-owned telecommunication enterprise. They are usually combinations of a public offering or a private sale. The method may vary according to several factors, including the objectives of the selling government, the status of the telecommunications enterprise, socio-political factors and the level of development of the domestic capital market. Prior to the sale, it may be necessary to establish the enterprise as a joint stock company.

Under a **public offering** of shares, the government sells large blocks of shares to institutions (domestic and/or international), to the employees of the enterprise and to the general public. Domestic offerings have traditionally been used to preclude foreign investments or when offerings are considered too small. Some countries have elected to start with a domestic offering but have permitted foreign ownership later (e.g., Japan). In other cases, domestic and international offerings are made at the same time (e.g., British Telecom). Some countries may choose to sell blocks of shares via institutional intermediaries or underwriters due to the inability of the domestic capital market to absorb large blocks of shares. For example, whereas a first tranche of BT shares were offered directly to about two million private investors in 1984, in Malaysia, about 50 per cent of the shares were offered to institutional investors and the remainder to the public.

There are two pricing methods that can be used when a company is privatised using the public offering method: fixed price and tender. The fixed price method (e.g., Malaysia) determines a "fixed" price prior to the offering. With the tender method (e.g., Japan's NTT), the price is determined based on the tenders received and the shares available. There are advantages and disadvantages to each method. The fixed price method may result in over-subscription. The tender method, which is more complex, may lead to a higher price.

Under a **private sale**, all or part of the government's shareholding is sold to a single buyer or a consortium of buyers, through direct negotiation or a competitive bidding process. The price of the sale is determined through the direct negotiation or competitive bidding process. Portions of the shares of CTC (Chile), CANTV (Venezuela) and TELMEX (Mexico) and all of the shares of Telecom New Zealand were sold through competitive bidding. All were partial sales except for Telecom New Zealand which was a full sale. Many governments have elected to retain either a majority share or a special non-voting controlling share (e.g., the "Kiwi share" in New Zealand) when inviting in private sector investors.

Source: This section draws upon the article "Sale of state-owned telecommunication enterprises", by M. Mustafa (The World Bank) which was published in the September 1993 edition of the *ITU Telecommunication Journal*.

#### 14.4.2 Private financing

Of course, private financing can be introduced into telecommunications without the need for any change of ownership or any issue of shares. The international venture capital market is now sufficiently educated in the virtues of investing in telecommunications to ensure that there is sufficient capital to fund most worth-while projects. Private financing often forms part of a broader package which may, for instance, allocate money from one of the multilateral development agencies, loan guarantees from the government, plus a commitment by the PTO to match the venture capital funds raised from its own internally-generated funds. Thanks to the creativity of financiers, there are as many (if not more) different financing options as there are projects to finance. Some of those which have been used in the telecommunications sector include:

- **Subscriber bonds**, whereby the potential future subscriber purchases a bond which is ensured against the assets of the company, which is usually redeemable at the end of a relatively short period (say up to 5 years) with a telephone connection. Alternatively, the bond can be resold to other potential subscribers. This form of financing, which was pioneered in Japan in the post-war years, is particularly appropriate in countries with a long waiting list for telephone connection but a low inflation rate;
- **Bonds, debentures or options**, usually of longer term duration such as ten to twenty years, that yield a certain amount of interest, usually at a fixed rate, and can be redeemed upon termination or resold before termination. The value of the bond can be guaranteed against the assets of the company;
- **Financing for a discrete project or service**, with accounts which are separate from those of the rest of the company, and which will have a separately identifiable cash flow. The potential investors will be repaid according to the eventual level of success of the project. Some of the new market entrants in the field of mobile communications have used accounting separation to finance new ventures outside their mainstream business.
- Joint venture financing, whereby some or all of the participants contribute the assets that they will eventually own. An example of this is the IRIDIUM project to construct a network of Personal

Communications Mobile Satellite Services (PC-MSS) to provide anywhere-to-anywhere telephone service via low-earth orbit satellites by the early part of the next century. The partners in the consortium include contractors, telecommunication operators, and rocket launch operators.

## Box 14.3: Project financing in action: The case of Telecom Asia

The financing of Telecom Asia, a Thailand-based telecommunication infrastructure provider which is now branching out into other parts of the region, provides a good example of how different sources of traditional and non-traditional financing can be combined into an innovative package. It has a 25 year concession to provide some 2 million new lines in the Bangkok area. It began operations in 1992 under sub-contract to the state-run operator, Telephone Organisation of Thailand (TOT), and currently has some 300'000 subscribers. It has successfully raised some US\$1.9 billion in project financing which includes:

- joint venture financing between the Thai agricultural products company, Charoen Pokphand, which owns 60 per cent and the US Bell Operating Company, Nynex. which owns 15 per cent;
- loans from four Thai banks and 19 other Thai financial institutions;
- supplier and commercial credits from a number of companies including AT&T, Siemens (via Kreditanstalt für Wiederaufbau), Mitsui and Tomen Corporation;
- some US\$485m raised through an initial public offering (IPO) of shares equivalent to 10 per cent of the companies equity

Telecom Asia is now the second largest company quoted on the Thai stock exchange. It may even overtake TOT in terms of lines installed before the end of the century. It certainly already has a higher employee productivity and is consequently able to offer more attractive wages to employees. In order to expand, it is looking for further government concessions, but it is also launching new ventures in Vietnam, China and elsewhere. Telecom Asia provides a good example of how private sector participation can be introduced into a country which still, for political reasons, wishes to retain nominal state ownership and to protect the interests of existing operators. It also shows that project financing is available, even from domestic financial institutions, provided there is a coherent business plan in place.

## 14.4.3 Concessions

One form of network financing which has grown enormously in popularity is the award of concessions to companies to construct facilities. As with project financing, there are many different sub-options. For instance:

- the concession may be awarded as part of a **competitive tender** or the concessionaire may be appointed;
- the concession may be awarded to an individual company or to a **consortium**;
- the concession may be **exclusive** or may be one of many awarded to offer the same service;
- the concession may be **open-ended** or may be based on the completion of a specific project or the provision of a certain amount of infrastructure (e.g. up to 1 million new lines);
- the concession may involve purely local investors or may include **foreign investment**, perhaps up to a certain limit;
- the concessionaire may be allowed to build, own and operate (**BOO**) the infrastructure, to build, own and eventually transfer ownership to the state or the public operator at the end of the concession period (**BOT**) or may be required to build, transfer ownership, but then retain the right to operate the infrastructure for a given period (**BTO**).

This latter form of transaction has been developed into practically an art form in Thailand where the government has decided to retain the legal monopoly of the two state-owned operators, CAT and TOT, but to award concessions to a number of different operators who, while not owning the infrastructure, would have the right to operate it for a certain period (on average 25 years) and to share revenues with the state-run operators during that period. In practice, the new concessionaires -- such as Telecom Asia, Thai Telephone and Telecommunication (TT&T), TAC, AIS, Thai Skycom and Jasmine International -- have been very successful and have actually overtaken the existing operators in terms of mobile communications subscribers and may soon do so in terms of fixed-link lines installed.

### Table 14.5: Private sector involvement in Thailand

Selected telecommunication concessions

Project	Investor	Years	Start	Lines/subscribers (June 1994)	Owner
2 million lines in	Telecom Asia	25	1992	150'000	Telephone Organisation of Thailand
Bangkok					
1 million lines in	TT &T	25	1993	30'000	Telephone Organisation of Thailand
provinces					
Satellites	Shinawatra	30	1993	n.a.	Ministry of Communications
Paging	Shinawatra	15	1990	n.a.	Telephone Organisation of Thailand
Data	Shinawatra	10	1990	n.a.	Telephone Organisation of Thailand
Cellular	AIS	15	1990	320'000	Telephone Organisation of Thailand
	(Shinawatra)				
Paging	Pacific Telesis	10	1987	n.a.	Communications Authority of Thailand
Cellular	TAC (Ucom	15	1991	170'000	Communications Authority of Thailand
	Group)				

Source: Shinawatra International, Public Network Europe (July/August 1994)

#### 14.5 How to do it

In this chapter, a number of different examples of successful infrastructure projects have been demonstrated including those in Argentina, Chile, Thailand, Japan and Botswana. However these are not the only examples, and may not even be the best. A survey of the fastest growing telecommunications economies (Table 14.6) shows that some 17 countries have sustained network growth rates of 15 per cent or more over the last decade and the list includes countries from virtually every continent, big countries as well as small countries.

This chapter has provided a manual for what information needs to be collected and monitored by a country which is undertaking a major investment programme and has indicated those sources of funding -- traditional and non-traditional -- that can be used. However, it is important to return to a theme developed earlier, namely that even in the most sophisticated financing packages, it is still the user that will eventually pay. No telecommunications company can succeed in the long term to sustain an investment drive unless the tariff structure delivers sufficient levels of revenue per subscriber to pay for the investment. Furthermore, in a competitive world, the operator which has the most efficient tariff structure will invariably be more efficient to potential investors than those operators which have not yet started on the process of tariff rebalancing or which retain loss-making social tariffs. In this sense, Chapter 14 of these guidelines should not be consulted in isolation, but should be read in conjunction with Chapter 13 (Tariff Reform).

So what is the best strategy for infrastructural growth in telecommunications? The answer is straightforward: **invest more**. As shown in Figure 14.3, a simple analysis of the relationship between network growth and the relative level of investment (approximated by the level of investment as a percentage of telecommunication revenue) shows a strong positive correlation between the two. Those Public Telecommunication Operators (PTOs) that have invested at twice the global average (60 per cent rather than 30 per cent) have generally also experienced network growth at twice the global average (10 per cent rather than 5 per cent). Obviously, there will always be some countries that do not fit the general trend: some countries can invest more efficiently and grow faster while others apparently need to spend more just to keep up with the average. But nevertheless, the general trend holds true; namely that the more you invest, the faster you grow; and the faster you grow, the more you have to invest. The average level of revenue per subscriber in the telecommunications industry is around US\$735 per year which is around half the average cost of a new telephone line. This suggests that new investment could be repaid in as little as two years.

What's more, it seems that this strategy works well in a variety of different ideological, economic and organisational frameworks. Indeed, if one looks in Figure 14.3 at the countries which appear to have invested most wisely (in terms of gaining a higher rate of network growth than would have been expected) over the last five years (Belize, Chile, Gambia, China, Morocco) there is no obvious common theme to the policies they have adopted. Chile and Belize have privatised their PTOs while Morocco and China have retained government ownership. GamTel in the

Gambia is still state-owned but enjoys a high degree of financial and managerial autonomy from the State. Thus, while the international policy agenda in telecommunications over the last few years has been dominated by discussion of the respective merits of privatisation versus public ownership or competition versus monopoly, the real criteria for success has really been high investment versus low investment. An operating environment which encourages high investment -irrespective of ownership, market structure or the role of the state -- will almost invariably produce higher network growth that an operating environment which sustains low investment. In summary, the three best strategies for infrastructural development in telecommunications are to invest, then to select additional investors, and then to let anybody else who wants to invest to do so. In short, to invest, invest again and then invest some more.

#### Table 14.6: High achievers

Economies with per annum growth rate in main lines of greater than 15% (1983-92)

		Teledensity			Teledensity rank		
	Annual			Average			
	growth in			annual			
	main			growth			Change
Economy	lines	1983	1992	1982-91	1983	1992	in rank
	(1983-92)						
Macao	23.8%	5.06	32.64	23.0%	75	34	41
Cape Verde	22.7%	0.61	3.14	19.9%	133	109	24
Oman	22.2%	1.87	7.93	17.4%	112	83	29
Turkey	21.2%	3.50	16.11	18.5%	91	55	36
Burundi	20.6%	0.05	0.23	17.1%	182	166	16
Gambia	19.9%	0.33	1.33	16.9%	149	129	20
Maldives	18.1%	1.12	3.71	14.2%	122	103	19
China	17.9%	0.25	0.98	16.1%	157	135	22
Nepal	17.2%	0.10	0.33	14.2%	176	154	22
St. Lucia	16.8%	3.81	14.50	16.0%	85	61	24
St. Vincent	16.3%	3.55	13.97	16.5%	89	63	26
Thailand	16.2%	0.94	3.10	14.2%	127	110	17
Belize	16.2%	3.85	11.65	13.1%	83	67	16
Botswana	16.1%	0.95	2.62	12.0%	126	117	9
Dominican Republic	15.9%	2.05	6.35	13.4%	108	93	15
Egypt	15.7%	1.32	3.94	12.9%	117	102	15
Chad	15.4%	0.02	0.07	12.6%	183	182	1

*Note:* Not including economies with population under 100,000.

Source: ITU.