Chapter XIII

TARIFF REFORM

Contents

13.1 The functions of pricing

13.2 Tariff structure

13.3 Access charges
13.3.1 Installation fee

13.4 Usage charges
13.4.1 National call charges
13.4.2 International call charges
13.4.3 Tariff comparisons

13.5 The role of the ITU in the area of telecommunication tariffs
13.5.1 Evolution of tariff principles in the ITU
13.5.2 The present situation with regard to tariff principles
13.5.3 Are telecommunication tariffs too high?

13.6 Summary

Chapter XIII

TARIFF REFORM

Purpose of this chapter

Chapter 13 is intended to provide guidelines for operators intending to establish a new (reformed) tariff structure, ideally a cost-related structure designed to generate revenues for investment. It is recognised that this ideal structure can often be inhibited by socio-political considerations and, increasingly, by competition - especially in the international field.

For these, and other, reasons it is recommended that the first stage of tariff reform should be to examine accounting procedures and the management structure in general.

In the common case of insufficient costing information being available, the tariff comparison method described in this chapter, the comparison of a 'basket' of tariffs, is recommended as at least a first approach to establishing or reforming a tariff structure.

Finally, the role of the ITU in the field of international tariffs is explained, including an explanation of the accounting rate system.

Outputs to be obtained

- Scenarios for alternative tariff structures for inclusion in the strategic plan;
- Adoption of a cost-related tariff structure as soon as practicable.

Inputs required

- Analysis of the subscriber categories and their calling patterns;
- Analysis of costs involved;
- Definition of tariff strategy in the event of competition;
- Past, present and future financial analyses of the Administration.

Chapter XIII:

TARIFF REFORM

13.1 The functions of pricing

The tariff structure of a public telecommunications operator (PTO) is one of the key elements of any telecommunications development plan because it provides the means by which the development of the network can be financed. The pricing of a service is a process that is done initially when the service is introduced for the first time, but the process needs to be repeated on a regular basis, for instance to keep abreast of inflation, to address new target groups of consumers, or to develop new service applications.

The price of a telecommunications service fulfils a variety of functions:

- The price is intended to **cover the full cos**t of providing the service, including some proportion of the initial start-up investment costs which may be depreciated over a number of years.

- Closely related to this is the need for the tariff structure to **generate revenues,** to create funds for new investment, to cover costs not solely related to the provision of the service (such as research & development, training, etc.), to provide scope for cross-subsidising potentially loss-making services, and to generate dividends for the shareholders in the organisation.

- The price of the service should **convey information to consumers**, for instance concerning the availability of the service, its value, its relationship to other services, its future evolution, and the optimal way to use the service to provide for specific applications;

- Public telecommunication operators (PTOs) are rarely able to introduce a new service in isolation from existing services, so that it is usually necessary to price the new service as **part of a range of services**.

- Finally, it is increasingly the case that the PTO itself is operating in a competitive market. Even where the PTO enjoys a national monopoly, it is often in competition with rival companies in the international market. Furthermore, a national PTO is often in indirect competition with other PTOs in the same region against which its services are compared. For this reason, the price of a new service must generally provide a **platform for competition**.

In order that the price can fulfil most, if not all, of these functions, it is important that the task of setting prices is carried out at a corporate level in the PTO, not just by a pricing unit, so that the full range of interests can be reflected -- including engineering, financing, marketing, strategic planning, billing and customer operations. It is also important that the starting point for any pricing exercise is a complete and accurate view of the cost structure of the PTO. Many PTOs in developing countries originated as, and in some cases still are, an arm of the government. In such cases, there is often little attention paid to cost-accounting methodologies. Worse still, many cost-accounting procedures which are applied look only at external costs (e.g., equipment procurement, rental, maintenance) and ignore internal staff costs, thus producing a biased view of the true cost of providing a service. For this reason, management reform, geared towards implementing modern cost-accounting and controlling procedures must go hand-in-hand with tariff reform.

13.2 Tariff structures

Telecommunications pricing is deceptively simple. There are three basic elements: access charges, usage charges and a tax. These can be broken down further:

- **access charges** comprise a one-off connection charge and an on-going subscription charge, usually in the form of line rental;

- **usage charges** vary by distance of the call, duration of the call and time of day or week when the call is made. In data networks, the duration charge may be replaced or supplemented by a volume charge for the amount of data transmitted or stored. For some services, a call set-up or call attempt charge is also levied, though this trend has been strongly resisted by user groups

- **tax**, usually in the form of a sales tax but occasionally in the form of a tax which is-specific to a particular service such as that levied on mobile telephone users in the UK.

Table 13.1: Breakdown of revenues from telephony services, OECD countries, 1991

Country	*Connection charges*		*Rental charges*	*Call charges*	*Revenue in US$m (1991)*
		(Combined)			
Australia	---	30.2%	---	69.8%	7 428
Austria	2.1%		23.7%	74.2%	2 956
Belgium	2.0%		24.7%	73.3%	2 804
Canada	n.a.		n.a.	n.a.	11 783
Denmark	2.6%		29.6%	67.7%	2 378
Finland	6.7%		19.1%	74.2%	2 091
France	1.1%		18.4%	80.5%	22 397
Germany	0.8%		30.2%	69.0%	28 430
Greece	1.1%		25.6%	73.3%	1 345
Iceland	3.4%		19.0%	77.6%	89
Ireland	2.0%		19.9%	78.1%	1 272
Italy	3.1%		25.0%	71.9%	15 680
Japan	---	28.1%	---	71.9%	49 029
Luxembourg	1.6%		17.4%	80.9%	203
Netherlands	9.4%		43.5%	47.1%	5 532
New Zealand	3.5%		45.2%	51.3%	1 487
Norway	2.0%		23.7%	74.3%	2 202
Portugal	2.5%		23.9%	73.5%	1 916
Spain	6.4%		26.2%	67.3%	9 701
Sweden	8.5%		27.1%	64.4%	5 140
Switzerland	---	30.8%	---	69.2%	5 156
Turkey	10.2%		2.2%	87.6%	2 246
United Kingdom	---	38.0%	---	62.0%	23 605
United States	4.0%		44.3%	51.7%	121 560
Total/average	**3.3%**		**33.7%**	**63.0%**	**326 430**

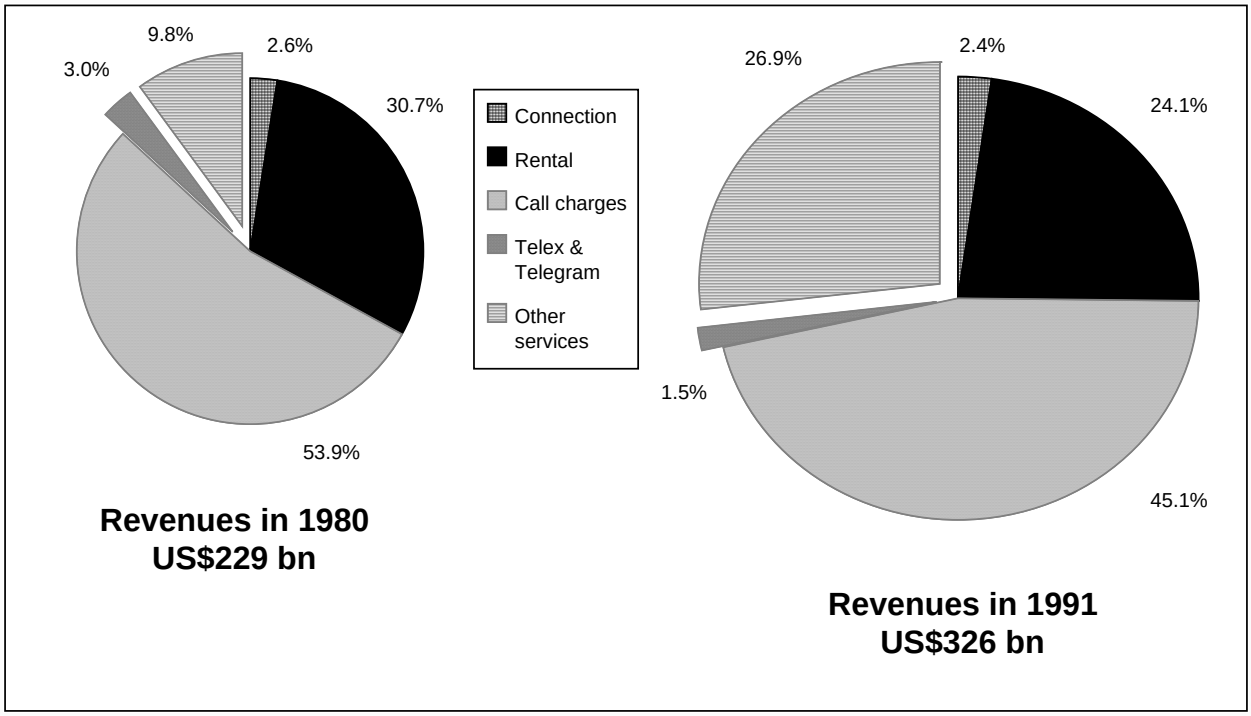
Note: All data relate to 1991 or most recent data available. Mexico, which joined the OECD in April 1994, is excluded.
Source: ITU/BDT telecommunication indicator database.

Among the industrialised nations of the OECD, which account for just over 80 per cent of global telecommunication revenues, access charges contributed 37 per cent of total revenues from telephone services in 1991 with the remainder coming from call charges. This percentage has risen from 33 per cent in 1986. However, the ratio varies considerably between countries. Access charges are highest as a percentage of overall revenues in New Zealand and the US (where some subscribers receive free local calls in return for a higher subscription charge) and in the Netherlands. Call charges form the highest component of telephony revenues in Turkey and France. Among non-OECD countries, fixed charges tend to be lower as a proportion of the whole. This is because developing countries often choose to provide subsidised access to the telephone service in an attempt to achieve goals of universal service. Often developing countries choose to use income from international services, both directly through tariffs and indirectly through the system of international accounting rates and settlement payments, as a source of cross-subsidy for access charges.

Over time, the revenue structure of PTOs is changing. In particular, as Figure 13.1 shows, the proportion of revenues which come from non-telephony services has more than doubled from 13 per cent to 28 per cent between 1980 and 1991 in the OECD countries. The main sources of non-telephony revenue growth have been mobile communications, data communications and leased lines. These have more than offset the declining revenue from telex

and telegram services. Nevertheless, telephony still provides just under three-quarters of the total revenue for PTOs in the OECD area and a much higher proportion for PTOs in developing countries.

Figure 13.1: Breakdown of PTO revenues by source in OECD countries, 1980 and 1991



Source: ITU telecommunication indicator database with supplementary information from OECD.

At one level, it could be argued that telecommunications pricing is actually becoming less complex. Three of the traditional components of tariff schedules -- distance, duration and volume -- are becoming less significant as an element of the total price. In newer service offerings, such as mobile communications or data communications, the element of distance has been virtually eliminated, except for international services. As mobile communication services begin to compete on price with the fixed-link telecommunications services, the distance-independent structure of mobile communications will force fixed-link operators to modify their own tariff structure. The factor driving this trend is the introduction of digital switching which undermines the rationale for pricing calls by distance travelled because the actual route taken to pass through the network depends on circuit availability not distance.

The rationale for volume-based tariffing, namely the need to ration network access to avoid congestion, is also becoming rapidly outdated. This is because PTOs are investing in high capacity backbone networks, usually using optical fibre cable. In the emerging telecommunications environment in which capacity is so plentiful that it is effectively free for individual calls, the practice of charging consumers according to the duration of their call or the amount of data transmitted is becoming meaningless. Instead the trend will be towards flat rate, leased line type tariffs for high volume users and call set-up charges for low volume users. A good illustration of this trend is the demise of X.400 based electronic mail networks compared with the exponential growth of the Internet. X.400-based tariff strategies were based on volume charges with little provision for volume discounts. Internet-based tariffing, on the other hand, is based on flat rate access charges which reflect the fact that the Internet is built around leased line capacity rather than being offered as a public switched service by a PTO.

If the argument is accepted that the traditional elements of cost-based telecommunications pricing -- distance, duration and volume -- are becoming less important, then other factors will no doubt take their place. These factors will necessarily be more closely related to the market value of a service rather than the cost of producing the service. For international services, for instance it remains the case that most users have little idea of how much a particular call costs and are not particularly concerned to find out. Because of "brand name" advertising of calling cards and country direct services, many consumers choose calling options which are actually more expensive. This may be because they are happier with the way in which the service is billed, especially if they are business travellers. The future tendency could be that the actual price of the service will be less significant than the way in which it is marketed and billed.

Table 13.2: Checklist of information needed and steps to be taken when setting or changing a tariff structure

✔	Analyse cost structure of operator, in particular the direct unit cost of providing the service (e.g., equipment and infrastructure costs, customer service and maintenance costs, billing etc.).
✔	Survey the call pattern of different types of user and conduct market survey of likely sensitivity to price changes.
✔	Review the past evolution of tariffs for the particular service or related services.
✔	Study relevant macro-economic data and forecasts, for instance for inflation, exchange rates, cost of living, tax structures etc.
✔	Meet with user groups to discuss concerns, analyse their requirements, review options etc.
✔	Develop scenarios for five year period based on cost trends, demand, economic and social trends, and relate them to tariff evolution.
✔	Analyse tariff structures of competitors (if any) and also tariff structures adopted in neighbouring or similar countries.
✔	Review social and policy objectives (see below).
✔	Define tariff options. Gain consensus internally within operator. Seek authorisation from Ministry or regulator (if necessary). Make forward announcement of change to public.

13.3 Access charges

Access charges may be regarded as the "cost of ownership" of a telephone because they represent the charge to the user for installing and maintaining a telephone before making the first call. Access charges include both an installation fee or collection charge and a subscription fee charged on a periodic basis (e.g., monthly, quarterly). For the PTO, access charges provide a more reliable and predictable form of income than usage charges in that they can be predicted purely as a function of the number of subscribers. Overall, within the OECD area, access charges provide 37 per cent of total revenues. For individual subscribers obviously the proportion varies. Generally speaking, access charges are more significant as a component of the total bill for residential subscribers than business subscribers and they are much more significant for low usage subscribers (e.g., pensioners, low income groups) than for high usage subscribers. For this reason, the level of access charges is much more politically sensitive than the level of call charges.

13.3.1 Installation fee

The installation fee refers to the one time payment for connection to the network. There may be related fees (for instance, the sale or rental price of a telephone handset or other subscriber equipment, change of number, change of address) but normally the installation fee is not a recurring charge. The installation fee itself may be split into several component charges:

- for registering the subscriber and assigning a number;
- for "connecting" the subscriber at the exchange (these days, usually just a change in the software database of the switch rather than a physical connection)
- for extending a line from the nearest distribution point in the subscribers area to the subscriber's premises;
- for internal wiring within the subscriber's premises;
- for installation of the telephone.

Not all these steps need to be carried out by the PTO. Many countries now permit the subscriber to buy and install a telephone and an increasing number of countries have liberalised the market for installation and customer premises wiring. In Switzerland and Austria, the actual connection fee relates only to the first two or three items listed above. The subscriber must then contact an electrician registered with the local PTT to complete the other steps. The prices the electrician charges are not regulated and will be based on the real cost of the work (i.e. it is not a uniform tariff). On the other hand, the service is provided in a competitive marketplace and may therefore be provided at a lower

price than by a monopoly PTO. For developing countries, this practice may be attractive as a way of encouraging entrepreneurship and the creation of small firms.

The level of the installation fee will also vary according to the policy of the PTO. There are a number of options available:

- a single price for all subscribers;
- a separate price for business and residential subscribers;
- special discounts for certain types of subscribers (e.g. hospitals, schools);
- a differential price based on the urgency of the request (in practice, in some countries a differential price is operated unofficially through bribes or non-registered payments);
- a discounted price for a shared or "party line".

There are also several options available to handle payment:

- The fee may be paid in full at the same time as the installation or shortly afterwards;
- The fee may be payable in instalments;
- The fee may be required in advance;
- An additional refundable deposit may be charged;
- The fee may be charged in the form of a "bond". The practice of issuing subscriber bonds which can be traded between potential subscribers or which are redeemable either for cash or for a telephone line was used successfully in Japan during the period in which it was trying to eliminate waiting lists and it has subsequently been used in other countries. It has the advantage of providing a cash advance for the operator as well as providing an investment for subscribers. Outside Japan, it has sometimes been less successful because high inflation rates have eroded the true value of the bond.
- In some parts of the world with high waiting lists, there is an unofficial second-hand market for telephone lines which are traded between individuals with neighbouring premises!

The actual level of price of an installation fee varies enormously between countries, perhaps more so than any other tariff. For instance, within Africa the installation charge varies from US$16 in Zambia to US$ 482 in Mauritania with the average being US$ 90. In Central and Eastern Europe the range is even more extreme from just US$1 in Azerbaijan to US$ 7'500 in Croatia which makes it impossible to compute a meaningful average. Obviously these charges are distorted by exchange rates. They may also, to some extent, reflect the different costs of installing a new telephone line in different countries. For the developing countries as whole, the average price per new line is around US$1'500 but again there is substantial variation (see Chapter 14). Ultimately the differences between countries have a political rather than an economic basis reflecting different underlying philosophies to pricing (see Table 13.3). A full account of the differences between countries in the level of tariffs is given in the annex to this chapter.

Table 13.3: Alternative social and policy objectives and their likely impact on tariff structures

Broad policy objective	*Implication for tariff structure*	*Options / examples*
Achieving universal service	No discrimination between potential users. Geographical averaging of tariffs. Cross-subsidy between international revenues and national service. Low cost of ownership (e.g., installation fee, access charges, local call charges)	Most countries have historically followed this model, at least in the early stage of network development. A good example is South Africa which does not differentiate between residential and business subscribers, which has very large local call zone and which has local tariffs which are among the cheapest in the world offset by international tariffs which are 40 % higher than the average for OECD countries.
Full cost recovery. Cost-oriented tariffs. Progressive elimination of cross-subsidy.	Needs to be based on a thorough review of cost structures, for instance by defining cost centres for different aspects of service and by defining a consistent cost allocation methodology. In general terms, access charges (especially installation fee) should be high but usage charges relatively low. Relatively little difference between calls of different distance or between national and international calls.	Cost-oriented (if not cost-based) tariffs are currently in vogue in many OECD countries, especially those in which competition is being introduced. Many countries are going through a process of rebalancing (e.g. raising access charges and local call charges; lowering long distance and international call charges) in order to prepare for competition. Some countries require accounting separation between different services (e.g., fixed-link and mobile) to prevent cross-subsidy. A good example of cost-based tariffs is the UK which has relatively high access charges, has one of the highest peak rate local call charges in the world, but has low long distance and international call charges especially for off-peak rates.
Maximisation of choice.	Multiple tariff options, for instance for high/low usage, for different subscriber categories, for purposes of social support. Competitive market structure. Low leased line tariffs.	Moving away from the principle of non-discrimination of tariffs by defining customised options. Low tariffs for leased lines permit self-provision of services and encourage development of active resale market. An example is the United States which has tariff schedules which are printed in several volumes and which permits extensive customer negotiation of tariffs. The US also provides specific tariffs for low income groups or other disadvantaged subscribers (e.g. Lifeline tariff options).
Achieving high rates of growth. Managing demand.	Relatively high tariff charges, especially installation fee and access charges, in order to provide adequate funds for investment, to attract external investment, and to reduce waiting lists. Tariffs differentiated between business and residential users.	Many newly industrialising economies have moved to a tariff structure which is designed to provide a strong revenue flow by targeting the business sector. For example, China recently introduced a separate tariff for businesses. Also Hungary now charges a significant proportion of the full cost of a new line in its installation fee which currently stands at around US$1200.

13.3.2 Subscription fees

The subscription fee is the recurring charge paid by the subscriber. It is often referred to as a "rental fee" in that the subscriber rarely if ever owns the line but merely rents it from the PTO. However this term can lead to confusion with the rental fee, if any, paid for the terminal handset. In the past, most PTOs obliged customers to rent telephones rather than buying them outright, but this practice is becoming increasingly rare now that terminal markets are becoming liberalised in most countries.

As is the case for installation fees, there are many ways in which a PTO might choose to structure subscription fees. For example:

- A **single subscription fee** for all subscribers. This may be justifiable in terms of universal service objectives (e.g. non-discriminatory pricing, uniform tariffs) and in terms of the value of the service to users (assuming there are no substantial differences in the level of quality). However, a single rate subscription fee is not really justifiable in terms of cost-based pricing. For instance, some subscribers demand a higher quality of service and a faster repair time for faults and are willing to pay for a better service. Also, different users make differing demands on the telephone. Some users may just need the telephone for very occasional emergency calls. Other telephones might be in virtually constant use (e.g. customer service helplines) for incoming calls. For this reason, the practice of charging a single subscription fee is becoming less common. In the Americas region, for instance, only four countries (Nicaragua, Aruba, Suriname, Bahamas) out of 35 for which data is available charge a single subscription fee for all subscribers.

- A **higher subscription fee for business** subscribers. This practice is much more common though there is little commonality on the level of the difference. For instance, in the Americas region the differential ranges from 668 per cent higher in Venezuela (US$ 12.14 per month for business subscribers compared to US$ 1.58 for residential subscribers) to just 25 per cent higher in Belize (US$5 compared with US$4). One problem arises with how to define business subscribers. For many small businesses and self-employed people, their business telephone is also their home telephone. Also, many countries choose to provide incentives to small businesses and may regard higher telephone access charges as a disincentive to enterprise. For this reason, a definition of a business might need to be based on only those subscribers with more than one line or those businesses with more than five employees.

- A certain number of **"free units"** included in the subscription fee. This is the case in a number of countries including Germany, Poland and Greece, and it is available as a tariff option in several others. The rationale is that those potential users that are marginal low users (for instance elderly people who need a telephone for medical or security reasons but make few, mainly local, calls) would be encouraged to subscribe. As such, it might be regarded as a "social tariff". However, the practice of including call units with access charges is also widely used in tariff options. For instance, the UK Personal Communications Network (PCN) mobile service provider, Orange, has defined five tariff options with different levels of usage from 15 minutes to 240 minutes per month. If a subscriber stays within these limits, then only the monthly charge is paid. If the subscriber exceeds the contracted amount, then a much higher call charge is paid. The advantage for the subscriber is (theoretically) a predictable monthly bill. The advantage for the operator is a guaranteed minimum income with the incentive that many subscribers underestimate their real needs so will invariably end up paying call charges at the higher level.

- A subscription fee that includes **unlimited local calling**. This practice is still used for residential subscribers in many parts of North America though it has fallen out of favour in Europe where the emphasis is on cost-oriented tariff structures. One advantage for the PTOs is that it creates a culture of long telephone calls. Thus, Americans typically make much longer calls than other nationalities, even when they are making expensive international calls. However, offering free local calls to business subscribers can lead to a substantial loss of revenue if several businesses club together to share leased lines for long distance calls. The trend among North American PTOs has therefore been to introduce "local measured service" with the incentive of lower subscriptions fees.

- A **monthly rental that includes the telephone handset**. Though most countries have liberalised their equipment markets, many developing countries still have monopolies in force. Even where terminal markets have been liberalised, many subscribers continue to rent their telephone as they are unaware of other options.

Rental charges are probably the most dependent of any tariff on "ability to pay". As a rough guide, the limit that most residential subscribers are willing to pay on telephone service is around 3 per cent of their annual income. This figure is based on surveys of household spending, though it will tend to vary between countries. New market entrants in telephony generally charge higher subscription fees than the incumbent PTO (because they are targeting business users

and higher volume residential subscribers). They then compete against the incumbent by offering lower call charges, particularly for long distance and international services where margins are higher. Those PTOs which are rebalancing their tariff structure in advance of the introduction of competition often choose to raise access charges to be able to compete on call charges. If subscription fees rise too fast then it will cause a high degree of "churn" in the subscriber base. Churn may be defined as the percentage of the subscriber base which renounces their subscription in any one year. For the operator, churn should be avoided because it generally imposes high costs (e.g. chasing debtors, cutting off the subscriber, redeeming the handset if it is rented). For this reason, any rise in subscription fee needs to be phased over a long period and should not be too much faster than the rise in living standards.

13.4 Usage charges

13.4.1 National call charges

In some small countries, the structure of national call charges is very simple. In Luxembourg, for instance, a national call costs 5 francs per minute, regardless of distance, with discounts only for different time of day or week. However, most countries have a more complex structure. The major variables are as follows:

- The length and value of the **meter unit** or "pulse". This is the basic unit of measurement in a call charge and most tariffs are multiples of this. Indeed, many countries express their tariffs in terms of seconds of call time per pulse (declining with distance) rather than cost per minute (increasing with distance). In traditional PTO tariff structures, the pulse is often synonymous with the cost of a local call charge of any length. As they have rebalanced their tariffs, the tendency has been to reduce the length of time that is covered by a single meter charge rather than by increasing the value of the pulse. In fully digital systems (e.g. Mercury in the UK), it is possible to offer subscribers "elapse time tariffing" where the basic meter unit is only worth 1 second and has a very low value. This system is attractive to subscribers in that it appears more equitable that they should pay only for the length of time that they call.

- The **call set-up fee** or **minimum call charge**. In many countries this is synonymous with the meter unit, but this is not necessarily so. In Italy, for instance, a fee of L127 per call is levied on calls whatever the distance. In other countries, the first minute of a call is tariffed at a higher rate than the rest of the call, which is an implicit call set-up charge. In some ISDN (Integrated Services Digital Network) tariff structures, even unsuccessful calls are charged a call set-up fee. In most countries, users have been successful in lobbying against the introduction of call set-up fees or charges for unsuccessful calls, but from a cost-orientation viewpoint, call set-up charges make more sense than charging calls by distance and duration.

- The number and size of **call zones**. In the case of Luxembourg quoted above, there is only a single call zone, but most countries have multiple zones. In a traditional PTO tariff structure, such as that of Russia, there are more than fifteen call zones of increasing distance. In Norway, subscribers in a thinly populated call zone pay lower subscription fees than other subscribers on the basis that they the receive less benefits from the subsidised local call fee. The local call zone is usually equivalent to the area covered by the local exchange. In Belgium, for instance, the tariff of a call is based on the number of call zones which a call passes. This can lead to the odd situation where neighbours who happen to be on the border of a local exchange are pay long distance call charges when they call each other. However, many countries now have "sliding call zones" whereby the price of the call is directly related to the distance.

- The **distance of the call**. As noted above, traditional PTO tariff structures are characterised by multiple call zones so that the price of the call is highly dependent on distance. In modernised tariff structures, the tendency has been to reduce the number of call zones and therefore reduce the distance component of the call. In the UK, for instance, there are just three call zones at the local level (up to 25 km around large cities), up to 56 km, and beyond 56 km. The rationale for this is that in a modern, fully digital network, the actual distance travelled by the call is largely irrelevant as the call will be automatically routed by the cheapest, most convenient or least busy route. Furthermore, it is the call set-up phase which incurs costs for the PTO, not the distance or duration of the call. In most cellular radio networks, for instance, there is no distance element to the call. However, calls made from some large cities, where there is a relative shortage of spectrum, may be charged at a higher rate than calls made in rural areas.

- The **duration of the call**. For most telecommunications services, the user is charged according to the length of time that the line is occupied, which is logically the duration of the call. The main exception to this is leased line tariffs which are based on the principle of the user renting a particular part of the public network in order to make an unlimited number of calls between two addresses. Some PTOs also offer "Virtual Private Networks" (VPNs) which offer a similar range of benefits but in which the network used is still regarded as the public network rather than a private network. With the exception of leased lines and VPNs, most

telecommunication tariffs rise in direct proportion to the length of the call, i.e., they are linear. So a fifty minute call cost fifty times more than a one minute call. From a cost-orientation point of view, this does not make sense, as noted above. For this reason, some PTOs have considered introducing non-linear tariffs for some services. For instance, in a data communications service, as the volume of data transmitted grows (either due to a longer call or a more efficient use of the line), the unit cost per packet of data diminishes. Similarly, one of the fundamental principles of tariff options, such as those of the UK company Orange discussed above, is that high volume users receive discounts. However, most PTOs continue to use linear tariffs for the majority of consumer-oriented services, if only for the sake of simplicity.

- The **time of day or week** when the call is made. All telecommunications operators experience times when the network is busy, and other times when demand is slack. These times vary according to the hours of the day, the days of the week and, to a lesser extent, the months of the year. The purpose of tariff structures which vary according to the level of demand is partly to "shape the load" (i.e. to even out the pattern of demand, thereby producing more efficient network usage) but also to stimulate more calls, and longer calls, during off-peak hours. Most countries now offer at least one off-peak discount, usually during the night period and at weekends, and some countries have three or four different rates. Some PTOs offer bigger discounts for off-peak long distance calls than for local calls as the margins are greater. The actual timing of calling hours varies between countries according to socio-cultural determinants. For instance, France has an off-peak rate around lunch hour, but enforces peak rate calling on Saturday mornings when many businesses are still at work.

For usage charges, unlike access charges, PTOs rarely differentiate between business and residential subscribers, except that they may define tariff options that are more attractive to one group of users. For instance, some PTOs offer tariffs that are particularly attractive to users who make many very short transaction-type calls (e.g. credit card verification) though this again is usually in the form of a tariff option rather than a publicly available tariff.

Given the wide range of elements which are involved in defining call charges (distance, duration, time of day/week, volume, call set-up charge, meter unit etc) there is an almost infinite variety of choice for defining tariff options or for rebalancing tariffs. However, it is possible to recognise certain common elements among most countries which have embarked upon the restructuring process:

- A **reduction in the size of the meter unit**, both in terms of time and in terms of value. This provides more flexibility for defining tariff structures and for adapting tariffs to changes in inflation or to regulatory price capping.

- A **rise in the price of local call charges**, for instance by introducing call metering for local calls, by reducing the length of the call unit, by increasing the size of the local call zone or by increasing the price of local and suburban calls relative to long-distance and international calls.

- **Reducing the distance component** of the tariff structure, for instance by reducing the number of call zones or by reducing the differential between calls of different lengths. This has been facilitated by the introduction of digital switching and high capacity interexchange lines.

- **Increasing the importance of off-peak discounts**. While the engineering rationale for off-peak discounts has largely disappeared in modern networks, the marketing reason is as strong as ever. In modern digital networks with high-capacity inter-exchange routes, the requirement to manage demand and to shape the load is much reduced. In the UK, for instance, the morning peak rate tariff has recently been abolished. However, the desire on the part of PTOs to stimulate demand in off-peak hours is as strong as ever. Some PTOs have introduced tariffs that apply only at certain parts of the year when calling would otherwise be slack (e.g., around Christmas, or winter Sundays). In other countries, new intermediate rates have been introduced and/or the timing of the different calling hours has been altered.

- **Increasing the variety of tariff options** targeted at particular user groups or specific applications. For the more part, tariff options have been geared towards businesses but there is an increasing number of options available for residential subscribers. One often-copied example is the "Friends and family" programme of the US carrier, MCI, which offers reduced rates to a certain number of frequently-called telephone numbers.

More often than not, these rebalancing options are combined with a rebalancing of access charges, for instance to raise installation fees closer to costs or to raise access charges so that they provide a higher share of PTO income. the process of rebalancing is the result of three main pressures:

- the maturing of the network in terms of the growing subscriber base and the progressive amortisation of start-up infrastructure costs;
- the introduction, or threat of introduction, of competition;
- the effects of technological change on the economics of running a network.

These pressures are present as much in developing country networks as in the developed country networks, though the scale of the rebalancing process may be much greater and faster in the latter than the former. The main benefits of the rebalancing process to the consumer have been observed in international call charges which have experienced the biggest reductions. These are discussed in the next section.

13.4.2 International call charges

International call charges are one of the most important elements of a tariff structure because international service is one of the fastest growing and most profitable parts of the telecommunications sector. Thus international services have traditionally been used to cross-subsidise national network development. The case of Hungary provides a good example. International services provide around one third of the total revenue of the Hungarian Telephone Company and an even higher percentage of profits. Furthermore, a substantial part of the income from international services comes in the form of hard currency (e.g., incoming settlement payments, payments from foreign companies and residents) which can be used more easily in some developing countries to fund equipment purchases from abroad.

When setting charges for international services, PTOs need to consider most of the same issues as for national call charges, for instance, variation by distance, duration and time of day/week. However there are also some additional considerations which are unique to international service:

- The **accounting rate** to be used in determining settlement payments with operators from other countries. The accounting rate, which is discussed in more detail in section 13.5, may be viewed as the internal price set between the two PTOs which jointly provide international service. Generally, accounting rates are discussed on a bilateral basis, though there may be third countries involved, for instance for transit charges. Within Europe and the Mediterranean basin, there is a special working group, TEUREM, which discusses principles for setting accounting rates. Multi-lateral discussions also take place within the framework of Study Group III of the ITU-T.

- The **distance** between the two countries. Generally speaking, distance is even less important than for national tariffs. What really matters is the availability of facilities to make a particular call. However, neighbouring countries are, in general, more likely to share common facilities than distant countries. Also, some regional groupings, such as the EU, may be a significant factor in determining tariffs. Within the EU, for instance, there are some political pressures to introduce a common international tariff which would match the common postal charge.

- The **availability of facilitie**s between countries. There is a wide range of possibilities to determine which route a particular call will take. Many countries have jointly-provided international circuits (copper cable, optical fibre cable or radio-relay) which would be the preferred access route. However, where these are not available, or where the demand exceeds the supply, the other routings need to be explored. Switching via a third country which has joint facilities is one possibility. Alternatively, traffic could be switched via a satellite services provider such as INTELSAT or a regional operator. The exact proportion of traffic which travels via different facilities, and the costs associated with each, should be taken into account when establishing international tariffs. It will also be necessary to project forward to take account of likely new facilities which will come into service. During 1993/4, several new undersea cables have been put into service, such as that which links the Southern Africa region with Madeira and from there to Europe/North America. This could potentially change the economics of international calls from the whole southern Africa region.

- The **currency** used for payment. Settlement payments are generally made in a unit of common accounting such as the Gold franc, the US dollar or Special Drawing Rights (SDRs). Those countries which have limited currency convertibility or which have unstable or weak currencies might therefore choose to insist on payment of international call charges in a foreign currency, at least for multinational companies and foreign residents. When setting a tariff, it may also be necessary to take into account the relative risks associated with the currency of the called country. For higher risk countries where there is a danger that no settlement payment would be received in the event of a surplus of incoming traffic, then it may be prudent to compensate by charging a higher tariff for outgoing traffic.

- The **time zone** differences between countries. Until the rise of fax, computer mail and voicemail, the peak calling hours between countries used to be determined by the relative difference in time zones. Technological

change has to some extent reduced this. However, because different countries impose off-peak discounts at different times of the day or week, this can lead to distortions in the tariff. For instance, in the bilateral relationship between US and Switzerland (see Table 13.4), it is cheaper to call from the USA between 18.00 and 07.00 and again between 13.00 and 17.00 US time (assuming a six hour time difference) but calls in the opposite direction are cheaper between 13.00 and 19.00 and again between 23.00 and 24.00 Swiss time.

- The **degree of competition**. Because international call services have traditionally been used to cross-subsidise national network development, the scope for price undercutting is much larger than for national services. Thus the market is much more attractive to new market entrants. The number of countries which allow direct competition is relatively few, just over ten world-wide, though in these countries incumbent operators have sometimes lost a significant market share (see Table 13.5). However, most countries face some degree of competition from calling card services, home country direct and call-back options. These services compete with PTO offerings in terms of ease of use and, in the case of call-back at least (see Table 13.4) may actually compete also on price.

- The **volume of traffic** on a particular bilateral route. Few countries offer discounts on high volume traffic routes in their national tariffs (the USA and UK are two exceptions) but most countries take the volume of traffic (actual and forecast) into account when setting international tariffs. In general terms, the higher the traffic, the lower the unit costs. Furthermore, the higher the volume of traffic, the greater the likelihood that the countries concerned will have a direct facility connecting the two countries.

In addition to these factors which must be taken into account, there are many other reasons why the international tariff may vary between countries. For instance, the cost of providing the service may be higher in a country with a less developed network. Also, a country may choose to set international tariffs deliberately high to finance local network development. In order to investigate the real differences between countries in terms of their tariff structures, it is necessary to use tariff comparisons. Alternative methodologies for making comparisons are discussed below.

Table 13.4: Comparative call charges between Switzerland and the US, May 1994

In US dollars per minute of a four-minute call

Service	*From Switzerland to USA*	*From USA to Switzerland*
Sprint Express (one rate only)	$1.35	
USA Direct (AT&T, one rate only)	$2.05	
Sprint Intl. (Peak rate, 0700-1300)		$1.31
Sprint Intl. (Discount, 1300-1800)		$0.98
Sprint Intl. (Economy, 1800-0700)		$0.78
Swiss PTT (Peak rate 1000-2300)	$1.05	
Swiss PTT (Off-peak 2300-1000)	$0.84	
Kall-back (Peak rate, 1000-2300) (1)	$0.80	
Kall-back (Off-peak, 2300-1000)	$0.60	
Traffic volume 1992 (in million minutes)	65.3	93.5

Note: Exchange rate US$1 = 1.4235 SFr
(1) Subscription charge required.
Source: Sprint, Swiss PTT, TARIFICA, DOT database.

Table 13.5: Market share of competing international carriers

Percentage share of outgoing MiTT, 1990-1992

Country / Carrier	*1990*	*1991*	*1992*
US			
AT&T	78.4	74.8	70.3
MCI	14.6	17.8	21.2
Sprint	6.4	6.3	7.3
UK			
BT	86.0	80.7	76.0
Mercury	14.0	19.5	24.0
Japan			
KDD	88.0	73.7	69.7
IDC	6.5	13.5	15.3
ITJ	5.5	12.8	15.0
New Zealand			
TNZ	92.0	82.0	80.0
Clear	8.0	18.0	20.0
Korea (Rep.)			
Korea Tel.	100.0	100.0	79.9
Dacom	0.0	0.0	20.1

Source: Adapted from TeleGeography Inc., 1993.

13.4.3 Tariff comparisons

Three principal alternatives exist for the international comparison of telephone tariffs:

- rate comparisons in which a standard call (duration, distance and time of day all fixed) or a standard charge (installation, subscription, tax) is compared between countries;
- call pairs in which the cost of making the same call in different directions is compared -- for instance an international call;
- comparison between a "basket" of fixed and usage charges which reflect average usage patterns for different groups within society.

The first alternative is intuitively more simple and has been used in a number of different studies. One-to-one comparisons can reveal interesting differences between countries in their approach to tariffication and are especially useful for identifying trends over time or to calculate break-even points relative to leased circuits. However, they fail to portray the full range of subtleties involved in formulating a tariff structure. In particular:

- the methodology does not illustrate variations between countries in relative revenue derived from standing charges and usage charges;

- standardising on an average call does not pick up variations in the duration of meter units or charge pulses (for instance local calls are frequently unmetered), radius of call zones or the timing of peak, intermediate and low rates;

- one-to-one comparisons can not really be used to identify differences in the way telecommunications changes affect different user groups, such as business or residential subscribers.

The use of call pairs -- comparison of the cost of making the same call in opposite directions -- is a variation on simple rate comparisons and is particularly appropriate for international calls. When disparities in the cost of calls are matched by differences in the volume of traffic, this can lead to a trade imbalance so that, for instance, the USA runs a deficit on telecommunications traffic with Europe. Call pairs appear to offer the best solution for comparison of international call charges but cannot easily be used to compare the cost of national calls within countries without introducing the notion of a "basket" of charges.

a) Tariff baskets

The composition of the tariff basket is likely to be the most problematic aspect of constructing a harmonised methodology for tariff comparisons. A number of different baskets have been used in previous research. These include:

1. Siemens (1988) -- Residential only;
2. Association Française des Utilisateurs du Téléphone et des Télécommunications (six-monthly) -- Business and Residential;
3. Logica Consultancy Ltd. (Annual) -- TARIFICA Annual Review -- Business only;
4. B. Mitchell (1983) -- US Bell System -- Business and Residential;
5. M. McDowall (1987) -- OFTEL -- Business and Residential;
6. Australia Telecom (1988) -- Residential only.
7. OECD Tariff comparison basket (1990) -- Business, Residential, International, Mobile, X.25 data communications, leased lines.

The OECD basket is discussed in more detail here because it is the most complete and least biased towards the calling pattern of a single country. The spreadsheet-based computer model on which the comparisons are based is available from the OECD in Paris or from the ITU in Geneva.

b) The OECD basket

Any harmonised methodology necessarily represents a compromise between complexity and simplicity; between diversity and commonality. The following principles are used for the construction of the OECD tariff basket:

1. The methodology for tariff comparisons should initially be developed for non-mobile, real-time, voice telephony charges and later extended to a wider range of services including international calls, mobile communications services, leased lines and packet-switched data communications.

2. The methodology should include installation charges, subscription charges (rental) and usage charges but should exclude equipment rental.

3. Rather than simple rate comparisons, the methodology should use a basket of charges composed of fixed charges and national call charges. These two components should be calculated separately and then combined in a ratio which approximates to the average revenue pattern for Public Telecommunications Operators (see Table 13.1) and weighted according to average annual subscriber telephone bills.

4. The fixed charges should include annual subscription (rental) plus a proportion of the installation (connection) charge for new subscribers.

5. The usage charges should be proportional to the fixed charges and should include both local and long distance charges. They should be based on a basket of calls distributed by distance, time of day/week and duration according to usage patterns identified in international research.

6. A separate basket should be calculated for international calls using call pairs weighted by the likelihood of calling a particular destination (approximated by the value of telephone revenue of the called country).

7. Separate baskets should be constructed to reflect distinctive usage patterns, for instance for business and residential subscriber groups.

8. The preferred units for comparison should be purchasing power parities (PPPs) expressed in average US Dollar values for the previous year.

c) Implementing the methodology for Africa

The basic principles outlined above for a tariff comparison methodology can be put into practice by using a modular structure in which separate baskets are constructed for fixed charges and national call charges. These are then combined in a ratio which represents the average for the region. The methodology is applied to Africa in Figure 13.2

Step 1

In any tariff comparison, the specification of an average usage pattern over a given period ultimately involves a degree of arbitrary choice, especially with regard to the total number of calls. The methodology proposed here begins with the fixed charge basket and then allocates an "allowance" for usage charges. To calculate the fixed charge baskets, the formula used is :

(Monthly subscription charge x 12) plus (installation/5) minus equipment rental if charged

In other words, the fixed charges cover one year's usage with the installation charge discounted over five years. Using this formula, the average fixed charge basket in Africa would be $ 118, excluding tax.

Step 2

Having calculated the fixed charge basket, the usage charges can then be set by reference to the revenue structure of African PTOs. The average ratio of fixed charges to usage charges, calculated from ITU data, is approximately 37:63 (see Table 13.1). In other words, PTOs gain just over one-third of their telephone service revenues from fixed charges and two-thirds from usage charges (national charges plus a smaller element of international call charges). Ratios for business and residential user groups can be estimated on the basis of observed differences in their level of telephone usage. The ratio between fixed and usage charges have been set, using an iterative computer model, at 20:80 for national calls for business subscribers and 40:60 for residential subscribers in the OECD model. Applying the ratios therefore gives an annual "allowance" for usage charges for residential subscribers of $ 209.

Step 3

These calls can then be allocated to the variables of distance, (see Table 13.6) time of day/week (Table 13.7), and duration (Table 13.8), on the basis of international research on telephone usage patterns.

Step 4

Also, various modifications have to be added to the model to compensate for country-specific variations in tariff policy. These include:

- "Free" or reduced rate usage units included in subscription charge;
- Differences in tax rates;
- Countries which shift between fixed rate and metered calls at different times of day/week;
- Reduced tariffs for high-volume inter-city routes.

Step 5

To make comparisons between country tariff structures it is necessary to have a common unit for accounting. This can, however, introduce undesirable bias in that the relative value of a nation's currency reflects the efficiency of, and the level of confidence in, the national economy as a whole rather than just the telecommunications sector. Furthermore, a national currency will typically fluctuate more freely than the tariff structure.

Table 13.6: Distribution of national tariff basket of calls by different distances and different sizes
For residential and business users

Distance (km)	Percentage of calls			
	Small country		Large country	
	Business	Residential	Business	Residential
3 km	53	60	53	60
7 km	11	14	11	14
12 km	7	5	7	5
17 km	4	3	4	3
22 km	3	2	2.5	1.5
27 km	4	3.5	3.0	2.5
40 km	5	3.5	3.5	2.5
75 km	4	3.0	3.5	2.5
110 km	3	1.5	2.5	1.5
135 km	2	1.5	2.0	1.25
175 km	4	3.0	1.5	1.0
205 km	0	0	1.5	1.0
350 km	0	0	1.0	0.75
490 km	0	0	4.0	3.5
Total	100	100	100	100

Note: The total number of calls in the model is around 2'500 for business subscribers and 1'000 for residential subscribers.
Source : Adapted from OECD tariff comparison model. See OECD (1990) *Performance indicators for Public Telecommunication Operators.*

Table 13.7: Percentage distribution of calls by time of day or week

Time	National calls (%)		International calls (%)	
	Business	Residential	Business	Residential
Mon.-Fri.				
11.00	45.4	26.3		
15.00	10.6	22.1	75 %	25 %
20.00	7.0	25.6	Peak rate	Peak rate
03.00	0.8	3.0		
Saturday				
11.00	5.7	10.0	25 %	75 %
Sunday			Off-peak rate	Off-peak rate
13.00	0.5	13.0		

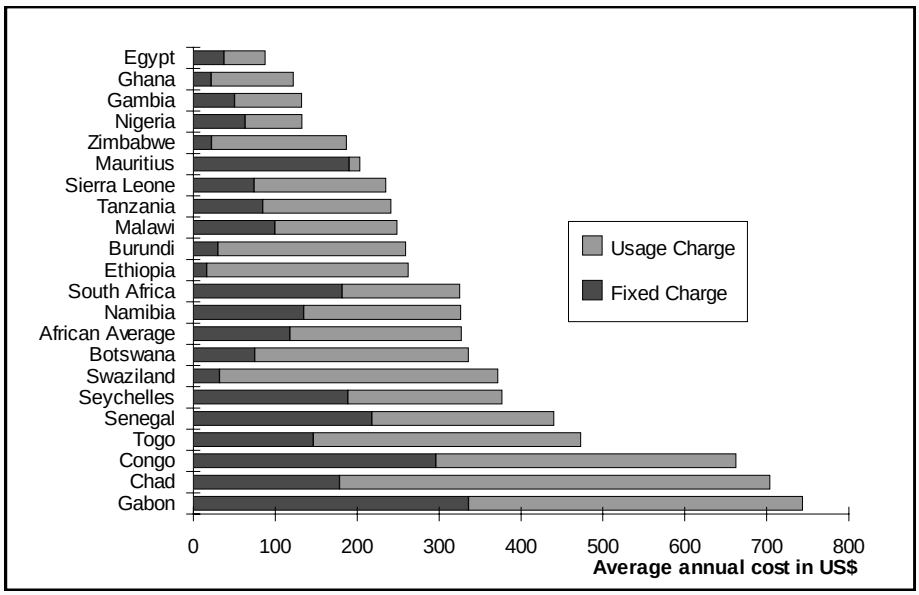
Source : Distribution matrix derived from international research. Adapted from OECD tariff comparison model. For more details, see OECD (1990) *Performance indicators for Public Telecommunication Operators.*

Table 13.8: Duration of national calls by distance and by time of day or week

Time	Duration of calls (minutes)					
	Up to 17 km		17 - 40 km		40 + km	
	Business	Residential	Business	Residential	Business	Residential
11.00	2.5	2.5	3.5	3.5	4.5	3.5
15.00	2.5	2.5	3.5	3.5	4.5	3.5
20.00	2.5	3.5	3.5	6.0	4.5	7.0
03.00	2.5	3.5	3.5	6.0	4.5	7.0
Saturday: 11.00	2.5	3.5	3.5	6.0	4.5	7.0
Sunday: 13.00	2.5	3.5	3.5	6.0	4.5	7.0

Source : Distribution matrix derived from international research. Adapted from OECD tariff comparison model. For more details, see OECD (1990) *Performance indicators for Public Telecommunication Operators.*

Figure 13.2: Comparison of basket of residential telephone charges in selected African countries
Tariff data valid for 1st January 1994 or most recent available. Charges expressed in US dollars.



Note: Selected countries only based on availability of data.
Source: OECD Tariff comparison model.

There are three main alternatives for price comparisons:

- Conversion to a common currency unit. This would typically be the US dollar, as used in the methodology described above, but could conceivably be the "Gold franc" or the Special Drawing Rights (SDRs) which are used in international telecommunications accounting;

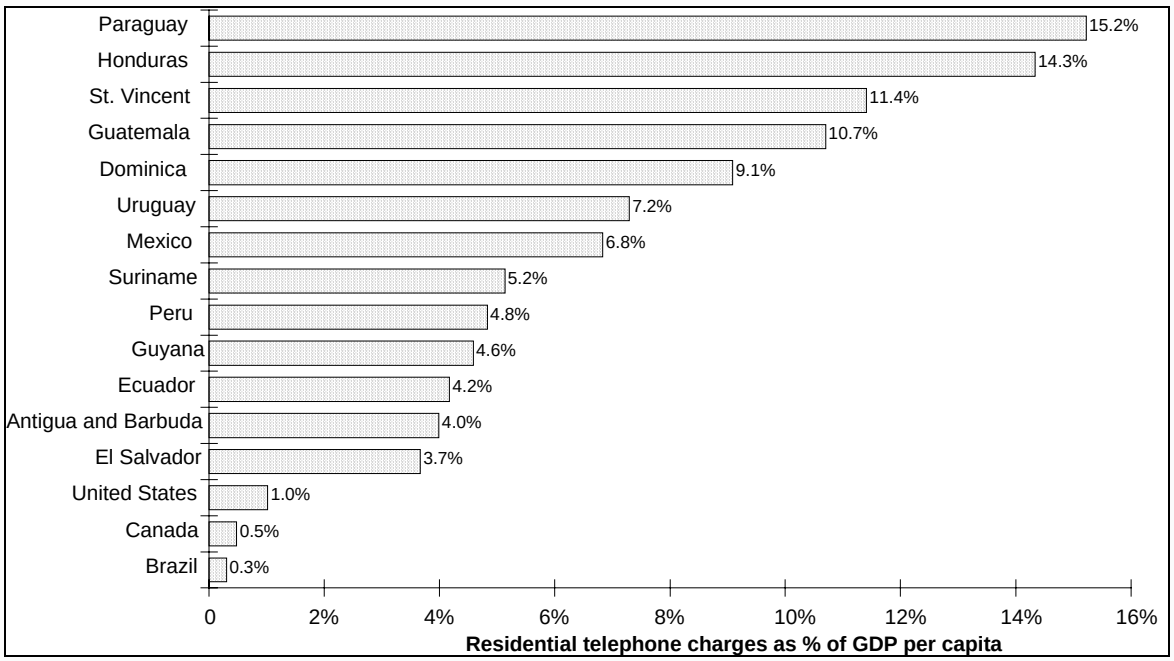
- Purchasing power parities (PPPs), which are calculated on an annual basis by the OECD and Eurostat, and reflect the real purchasing power of a national currency;

- Other comparative units, such as hours of work or the cost of a retail basket. In Figure 13.3, for instance, residential charges are expressed as a percentage of the Gross Domestic Product (GDP) per capita which is used as a surrogate for average living standard. In the example region chosen (Latin America), the countries

with the lowest relative tariffs are the richest countries of the region, but nonetheless there are still major differences even between neighbouring countries such as Paraguay (15.2%) and Brazil (0.3%) or between Honduras (14.3%) and El Salvador (3.7%). There is little apparent explanation for these wide variations.

For Africa, there are no reliable PPP exchange rates available. Therefore average annual US dollar rates have been used in the analysis.

Figure 13.3: Residential telephone charges as a percentage of GDP
For selected countries of Americas region, 1992



Source: ITU, Americas Telecommunication Indicators, 1993

d) Comparison of international call charges

The methodology for calculating a basket of international calls needs to be slightly more sophisticated than the national basket to compensate for differences in the relative location of countries. The formula, which is based on call pairs and estimates the cost of an "average" international call from each country, is calculated by taking the costs of calls to all other African countries and weighting the average by the likelihood of calling each country. In this way, it approximates to a gravity model. Ideally, the weighting would be traffic volumes, but as this information is difficult to obtain for many African countries, the population of the called country has been used instead.

For the purposes of calculating the international basket, the cost of making each call is expressed as a percentage of the average cost of a call in opposite directions of the same duration and made at the same time. In this way the international basket for each country expresses the cost of outward calls to African countries relative to the cost of inward calls (see Tables 13.9 and 13.10). Because some countries employ a charging scale which decreases as the length of the phone call increases, an average length of four minutes per call is assumed, but duration and distance variables are otherwise cancelled out by the methodology. Only the timing of the call matters as some countries, but not others, offer off-peak discounts. Two baskets have been defined, for business and residential consumers, according to the mix of peak and off-peak calls.

Table 13.9: Formulae used in calculating the basket of international calls

To calculate call pairs:

$$\mathbf{Ix_{ij}} = x_{ij}\,[x_{ij} + x_{ij})/2] \times 100$$

Where $\mathbf{Ix_{ij}}$ = indexed cost of call from country **i** to country **j**

$\mathbf{x_{ij}}$ = actual cost of call from country **i** to country **j** (in common currency)

$\mathbf{x_{ji}}$ = actual cost of call from country **j** to country **i** (in common currency

To calculate country averages

$$\Sigma\ \mathbf{I\ mean\ x_i} = (\text{Sum of } Ixij.Pj)/\text{sum of } \mathbf{pj}$$

Where **I mean** $\mathbf{x_i}$ = average cost of indexed international calls from country **i**

$\mathbf{Ix_{ij}}$ = indexed cost of calls from country **i** to country **j**

$\mathbf{P_j}$ = population of country **j**

Source: Adapted from OECD (1990) Performance indicators for Public Telecommunications Operators.

International call baskets are presented, weighted by the African average in Table 13.10. The level of variation is much less than for national baskets with Malawi (75.9 per cent of African average) being the cheapest and Tunisia (157.5 per cent of African average) being the most expensive for business users.

In summary, tariff comparisons provide a useful means of analysing the tariff structure of a particular country by permitting comparisons with other similar or neighbouring countries. While no comparison can ever be perfect, the methodology developed at OECD and extended here to the countries of Africa provides a useful rule of thumb for assessing the degree to which tariff reform has progressed in different countries.

13.5 The role of the ITU in the area of telecommunication tariffs

The ITU is a world-wide organisation within which governments and the private telecommunication sector co-ordinate the establishment and operation of telecommunication networks and services. One of the purposes of the Union is to facilitate the world-wide standardisation of telecommunications and it is the ITU Telecommunication Standardisation Sector (ITU-T, former CCITT) which deals with that problem.

Standardisation in ITU-T is carried out by means of "study groups". Each study group deals with a specific area of telecommunications. Throughout the year, hundreds of experts meet at ITU Headquarters in Geneva to develop models and standards, and thousands of others submit proposals by correspondence. The standardisation of telecommunication technology and the operational management of the telecommunication services have seen many changes, but there have been relatively few problems which could not be resolved or for which an amicable settlement or a compromise could not be reached in the development of the ITU and especially of the ITU Telecommunication Standardisation Sector.

Such problems as technical standards, compatibility or operational procedure in the telecommunication service have been discussed from the viewpoints of practicability and efficiency, thus eliminating the need for political intervention. This does not mean to say, of course, that there are no area in telecommunications where government policy is reflected, and the most obvious example is that of pricing, i.e. tariffs.

Table 13.10: Basket of international calls for Africa, weighted by regional average
Indexed by country pairs, based on 1992 US$ exchange rate
Tariff data is valid for 1st January 1994, or most recent

	Business (excluding tax)	*Residential (excluding tax)*
Algeria	81.12	81.44
Angola	98.65	100.75
Botswana	102.65	107.47
Burundi	91.77	90.32
Cameroon	87.40	94.02
Cape Verde	76.53	78.27
Chad	102.67	98.94
Egypt	94.78	98.78
Gabon	126.60	131.28
Gambia	99.66	94.36
Ghana	109.88	109.55
Kenya	116.35	117.28
Malawi	75.91	67.76
Morocco	93.52	94.39
Namibia	94.39	95.39
Senegal	95.15	93.05
Seychelles	76.97	78.91
South Africa	130.48	133.01
Swaziland	127.61	122.68
Tanzania	88.35	92.15
Togo	83.73	84.84
Tunisia	157.52	153.25
Uganda	95.50	97.84
Zambia	92.81	84.27
Africa average	**100.00**	**100.00**

Source: ITU, adapted from OECD tariff comparison methodology. Tariff data supplied by LYNX Inc.

Table 13.11: International Tariff charges for Africa

In US dollars, at average 1992 exchange rates
Values expressed are per minute of traffic, peak rate

From/to	Algeria	Angola	Botswana	Burundi	Cameroon	CapVerde	Chad	Egypt	Gabon	Gambia	Ghana	Kenya	Malawi	Morocco	Namibia	Senegal	Seychelles	S. Africa	Swaziland	Tanzania	Togo	Tunisia	Uganda	Zimbabwe
Algeria	***	2.43	4.42	4.42	2.43	3.92	2.43	3.69	2.43	3.92	4.42	4.42	3.30	0.34	3.39	2.43	4.42	2.43	3.92	2.43	2.43	0.34	0.00	2.43
Angola	3.82	***	3.82	3.82	3.82	2.45	3.82	3.82	3.82	3.82	3.82	3.82	3.82	3.82	3.82	3.82	3.82	3.82	3.82	3.82	3.82	3.82	3.82	3.82
Botswana	4.02	2.56	***	4.02	4.02	4.02	4.02	4.02	4.02	4.02	4.02	2.56	0.98	4.02	0.73	4.02	4.02	0.73	0.98	2.56	4.02	4.02	2.56	0.73
Burundi	3.26	4.55	4.39	***	5.43	4.55	5.43	5.28	5.43	4.39	5.43	2.00	5.43	3.26	4.39	4.01	5.43	3.26	4.39	2.67	4.34	3.08	2.67	5.28
Cameroon	3.32	6.35	4.99	4.99	***	6.35	1.96	5.74	1.96	7.25	6.20	4.99	4.99	3.78	6.80	1.96	3.32	8.16	8.16	8.16	1.96	3.32	4.99	4.99
C. Verde	5.88	2.94	5.88	5.88	5.88	***	5.88	5.88	5.88	5.88	5.88	5.88	5.88	5.88	5.88	1.32	5.88	5.88	5.88	5.88	5.88	5.88	5.88	5.88
Chad	5.67	8.22	8.22	8.22	8.22	8.22	***	8.22	8.22	8.22	8.22	8.22	8.22	5.67	8.22	3.68	8.78	8.22	8.22	8.22	3.68	5.67	8.22	8.22
Egypt	1.35	3.00	2.70	2.70	2.10	2.70	2.70	***	2.70	2.70	2.25	1.74	2.25	1.35	3.00	2.70	2.70	2.70	2.70	16.76	2.70	0.93	1.74	2.70
Gabon	4.91	9.82	11.33	7.37	2.46	7.37	2.46	11.33	***	11.33	11.33	11.33	11.33	4.91	11.33	2.46	9.82	11.33	11.33	11.33	2.46	4.91	11.33	11.33
Gambia	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	***	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70
Ghana	3.66	3.66	3.66	3.66	3.66	0.00	3.66	3.66	3.66	3.66	***	2.29	3.66	3.66	3.66	3.66	3.66	3.66	3.66	3.66	1.83	3.66	3.66	3.66
Kenya	1.80	1.80	1.24	1.24	1.80	1.80	1.80	1.80	1.80	1.80	1.80	***	1.24	1.80	1.80	1.80	1.24	1.80	1.24	0.99	1.80	1.80	0.99	1.24
Malawi	1.11	0.83	0.83	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	0.83	***	1.11	0.83	1.11	0.83	0.83	0.83	0.83	0.83	1.11	0.83	0.83
Morocco	0.16	3.75	3.75	3.75	2.67	2.14	2.14	2.14	2.67	2.67	3.75	2.67	3.75	***	3.75	2.14	2.67	3.75	3.75	3.75	2.67	0.96	2.67	3.75
Namibia	3.64	3.64	0.81	3.64	3.64	3.64	3.64	3.64	3.64	3.64	3.64	3.64	1.46	0.00	***	3.64	3.64	0.40	0.81	3.64	3.64	3.64	3.64	1.46
Senegal	2.02	6.04	6.04	2.02	1.42	2.02	1.42	6.04	1.42	1.13	2.02	6.04	6.04	1.42	6.04	***	0.00	6.04	6.04	6.04	1.42	3.02	6.04	6.04
Seychelles	6.91	4.44	4.44	4.44	8.20	6.91	6.91	6.43	8.20	4.44	6.91	2.47	6.43	6.91	6.43	8.20	***	3.95	8.20	2.47	8.20	6.91	2.47	8.20
S.Africa	4.00	4.00	0.32	2.66	3.33	3.33	3.33	4.00	4.00	4.00	3.33	2.66	0.89	4.00	0.32	4.00	4.00	***	0.32	2.66	4.00	4.00	2.66	0.32
Swaziland	2.81	3.16	0.82	3.42	3.04	3.04	3.74	5.35	3.19	2.90	2.61	1.49	1.79	2.97	0.46	3.35	2.49	0.46	***	2.11	3.21	2.19	1.58	0.82
Tanzania	5.00	5.00	4.00	4.00	5.00	5.00	5.00	4.00	5.00	5.00	5.00	4.00	4.00	5.00	4.00	5.00	4.00	4.00	4.00	***	5.00	5.00	4.00	4.00
Togo	3.78	6.04	7.56	6.04	3.78	4.72	1.89	7.56	3.78	6.04	3.78	8.39	6.04	3.78	7.56	1.89	7.56	6.04	7.56	6.04	***	3.78	6.04	7.08
Tunisia	0.71	3.96	3.96	3.96	3.17	3.96	3.17	2.38	3.17	3.96	3.96	3.96	3.96	0.71	3.96	3.17	3.96	3.96	3.96	3.96	3.17	***	3.96	3.96
Uganda	4.41	2.65	2.65	4.41	4.41	4.41	4.41	4.41	4.41	4.41	4.41	2.65	2.65	4.41	4.41	4.41	2.65	4.41	2.65	2.65	4.41	4.41	***	2.65
Zimbabwe	2.51	1.86	0.74	2.51	2.51	2.51	2.51	2.51	2.51	2.51	1.86	1.86	0.74	2.51	0.74	2.51	2.51	0.74	0.74	1.86	2.51	2.51	2.51	***

Source: ITU. Tariff data supplied by LYNX Inc.

Though there may be no remarkable difference in the types of service that are offered in different countries, the tariff policy will depend on the following factors :

- stage in the development of telecommunications;
- level of economic development and the financial situation;
- various geographical factors such as accessibility, distribution of population, terrain etc,;
- political system and in particular the definition of social policies such as Universal Service;
- managerial and market structure of telecommunication operating organisations;
- telecommunication policy.

These factors differ from country to country, and this may be why, of the various problems which must be resolved by the ITU and especially by the Telecommunication Standardisation Sector, tariff principles are the most difficult and delicate to deal with.

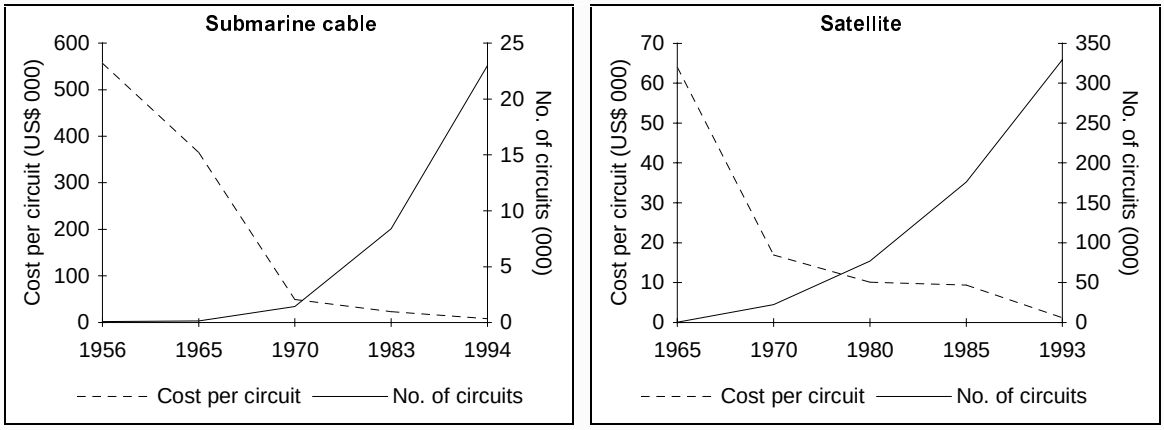
Study Group 3 deals with these general tariff and accounting principles. Study Group 3 is unique among the various study groups of ITU-T in that it is virtually the only group dealing with purely non-technical standardisation. The nature of participants in Study Group 3 is also unique, because they include delegates of administrations, recognised operating agencies, scientific and industrial organisations, other international organisations and also different user groups. The responsibilities of Study Group 3 cover the whole range of ITU-T defined services as far as their general tariff and accounting principles are concerned. Some of the work of Study Group 3 goes beyond simple tariff matters into regulatory or economic issues which are of great significance to the administration.

13.5.1 Evolution of tariff principles in the ITU

The charges for international telecommunication services have been reflecting the progressive technological development of the telecommunication sector, ever since the middle of the 19th century. In the intercontinental field, for example, we have witnessed the transoceanic telegraph cables confronting the introduction of wireless transmission, first by long wave then by short wave. More recently we have seen the introduction of the microwave radio-relay, the laying of coaxial cables, launching of geostationary satellites and today, optical fibre cables that are capable of carrying thousands of simultaneous telephone conversations across the oceans. All along, the history of telecommunication charges has been a history of reductions as greater capacity became available (see Figure 13.6). In addition to the cost-saving technical innovations, we find ourselves today amidst the power of the market force and the effects of deregulation and competition in the field of tariffs.

Figure 13.4: More for less

Capacity and costs of new trans-Atlantic submarine cable and INTELSAT satellite circuits



Source: TeleGeography 1992, STC Submarine Systems, INTELSAT.

The evolution of tariff principles has followed also technical, economical and political change. Some of the tariff principles were put forward and received general approval as early as 1865, at the inaugural meeting of the ITU in Paris, and they are still held by the ITU of today. These are the case of uniform rate principle between two countries, a single unit of area principle or a single transit rate per country principle. However, other principles have been modified to be adopted to the evolving telecommunication environment situation, and this is the case for collection charge determination principle.

Before 1973, under the ITU rules, the collection charge was derived more or less directly from the accounting rate which is the rate fixed and agreed between the two terminal administrations. This implied therefore that an administration was unable to fix on its own the charge to be collected from customers. The charge depended on the amount of reimbursement to the other carrier, fixed in terms of what are known as terminal and transit rates. The accounting rates (see Box 13.1), or the sum of terminal rates and transit fees where applicable, were agreed on the basis of amounts normally expressed in a common monetary unit called the gold franc. The gold franc, as its name implies, had a defined gold value up to the 1973 Malaga-Torremolinos Convention, and it was relatively easy in the days of fixed currency exchange systems based on gold values, to convert the accounting rate into collection charges expressed in national currencies. The result was that the charges applied for a single communication in a given relation were, in principle, symmetrical in both directions of the traffic.

In the Telegraph and Telephone Regulations adopted at the 1973 World Administrative Telegraph and Telephone Conference (WATTC), the collection charges were clearly stipulated as being "a national matter". In other words, each administration would fix the level of the charges to be collected in accordance with applicable national law, independent of the accounting rate. The only rule of an international implication was that administrations should make efforts to avoid too great a dissymetry of charges at both ends. This was indeed an epoch-making change in the principle of charge setting. But it was in a way a natural consequence of the change in the world monetary situation, i.e. the transfer from the Bretton Woods regime to the Smithsonian regime. The fixed relationship of collection charges and the accounting rates had reached its limits as currencies started to float, and conversion rates with the gold franc became unrealistic. The decisive factor was the demonetarisation of gold as adopted by the International Monetary Fund in 1976, some 5 years after President Nixon announced, in 1971, that the US would no longer accept the dollar to be exchanged for gold in the Federal reserves. Hence, the accounting rate became solely a basis for international settlement of accounts, and the basic principle of equivalent charges being applied to customers at both ends lost ground. However, since that basic principle had the effect of not only assuring the equality of charges but also of balancing, to a certain extent, the traffic in both directions, thereby minimising the risks in international accounting, the objective of avoiding too great a dissymetry was maintained in 1973, as well as in the new International Telecommunication Regulations adopted at WATTC 88 in Melbourne.

Box 13.1: What is an accounting rate?

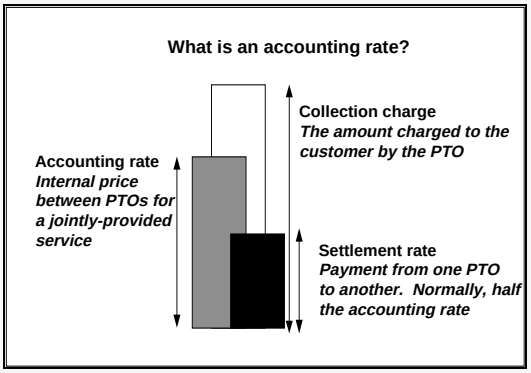
One of the main reasons that 20 European countries came together in 1865 to form what eventually became the International Telecommunication Union was that they needed to develop a means of dividing the revenues from international services between origin, destination and transit countries. The methodology that they developed is still with us today, though in a format which has been progressively modified. It is based on a dual price system whereby, for a single call, one price is charged to users by the originating PTO (the *collection charge*) and a second price is agreed by the terminating PTO and the originating PTO (the *accounting rate*). This is used to determine the price charged to the originating PTO by the terminating PTO (the *settlement rate*). If there is an imbalance in the volume of incoming and outgoing traffic, then the originating PTO which generates more traffic pays for the difference to compensate the terminating PTO (the *net settlement payment*). Under the guidance of Study Group III of the former CCITT (now the ITU Telecommunication Standardisation Sector, or ITU-T), an elaborate set of Recommendations were developed for most types of international traffic based on a simple 50:50 sharing of the accounting rates. On the whole the system generally worked well provided that five conditions held true:

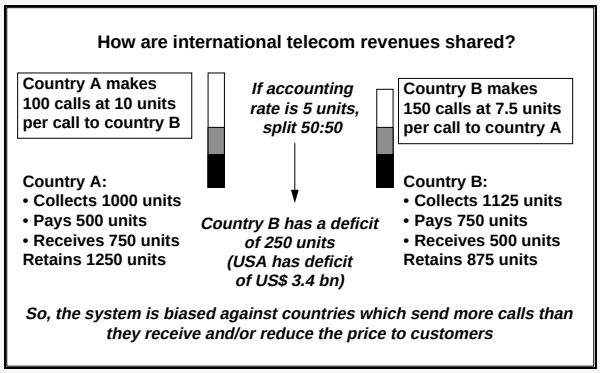
- collection charges were approximately equal for the same call made in different directions and were applied in a relatively simple manner without off-peak rates;
- incoming and outgoing traffic was approximately in balance for each main bilateral relationship between countries;
- collection charges were no lower than accounting rates;
- inflation rates and exchange rates were relatively constant between countries;
- bilateral relationships were conducted by monopoly partners.

However, in the modern era these conditions have begun to break down. Technological change has allowed for significant cuts in collection charges, for instance through the introduction of off-peak tariffs, particularly on the trans-Atlantic route; but the pace of change has been uneven. In particular, until recently the advantages of modernisation were not being reflected in accounting rates cuts. These trends, exacerbated by exchange rates fluctuations, have generated significant differences in the level of collection charges between countries. Consequently, imbalances in the traffic flow between countries began to grow.

Box Figure 13.1: How does the accounting rate system work?

Simple example showing application of accounting rates to international telecommunication services





Worked example (excluding transit traffic and excluding off-peak tariffs and accounting rates)

USA (AT&T) to Italy: Collection charge, peak rate, January 1994 = US$ 1.23 per minute for a 4 minute call
Italy to USA Collection charge, peak rate, January 1994 = L2273 (US$ 1.42) per minute for a 4 minute call.

Between Italy & USA Accounting rate, peak rate, 1992 = SDR 1.2 (US$ 1.65) per minute.
Settlement payment = accounting rate divided by two = $0.825

MiTT from USA to Italy, 1992 207 million minutes, at $1.23 per minute, produces revenues of US$ 255m
MiTT from Italy to USA, 1992 118 million minutes, at $1.42 per minute, produces revenues of US$ 168m.

Settlement payment from USA to Italy, 1992 = 207m x $0.825 = US$ 171m (actually US$ 157m with off-peak rates & transit)
Settlement payment from Italy to USA, 1992 = 118m x $0.825 = US$ 97m (actually US$ 90m with off-peak rates & transit)

Overall US gains US$ 84m (255-171) retained revenue, plus US$ 97m settlement payment = US$ 181m (actually US$ 156m).
Overall Italy gains US$ 71m (168-97) retained revenue, plus US$ 171m settlement payment = US$ 242m (actually US$ 17m).
Real US deficit = US$ 67m (157-90). So, Italy makes 39 per cent more money from 43 per cent less traffic.

The general principles applicable to international leased private telecommunication circuits have been also revised drastically. To see the evolution of tariff principles in the leased circuit services the following example is very significant. Until 1972, the leased circuit service was "normally authorised in international relations only when telecommunication circuits remain available after the needs of telecommunication services have been satisfied" (Recommendation D.1, Mar del Plata, 1963). It is only in 1972 that administrations accepted the addition of the following paragraph : "However, in their planning work, the administrations should not forget the need for leased circuits." The other conditions of service were also very restrictive. Because international leased circuits became a major commercial tool and an important information transport medium for the business community, Study Group 3 devoted considerable attention to this issue from 1989. The new principles adopted quite recently (revised ITU-T Recommendation D.1, 1991) advocate a certain degree of liberalisation in the condition of use of international private leased circuits, particularly in respect of the constitution of networks and their use by third parties including the public as well as their interconnection to public networks. It is expected that the liberalisation of international leased private circuits and networks by the ITU will be a factor of development of such transmission media, in line with the proposed GATT sectoral annex on telecommunications. It is also expected that such liberalisation and the resulting increased competitiveness will lead to a possible shift in tariffs between international, long-distance and local calls.

13.5.2 The present situation with regard to tariff principles

One of the purposes of the Union, according to Article 4 (paragraph 2 d) of the Nairobi International Telecommunication Convention is that the Union should: "foster collaboration among its Members with a view to the establishment of rates at levels as low as possible consistent with an efficient service and taking into account the necessity for maintaining independent financial administration of telecommunications on a sound basis." In addition, Article 18 of the Convention concerning "the right of the public to use the international telecommunication service" provides that "Member countries should recognise the rights of the public to correspondence and also that the services, charges and safeguards shall be the same for all users in each category of correspondence without any priority or preference".

Taking into account these principles, Study Group 3 elaborated several general tariff principles which will be found in the D-series Recommendations.

Recommendation D.1 -- General principles for the leasing of international circuits -- was discussed above. Another Recommendation containing charging principles is Recommendation D.5. The following concepts are described in Recommendation D.5 :

1) principle of overall cost compensation (including capital interest);
2) recognition of cross-subsidisation among services;
3) consideration of the value of the service rendered to the user;
4) avoidance of harmful competition among different types of services;
5) respect for the principle that the surplus income should not be greater than the amount required for the efficient running of services.

6) This Recommendation is interesting and important in that it indicates various factors which Public Telecommunication Operators used to consider in determining their rates, for example :

7) consideration of the fact that telecommunications, as a public utility, is indispensable to general economic life and the national administration;

8) telecommunication carriers provide various kinds of services, of which some are profitable and others are not. Therefore the possibility of cross-subsidisation cannot be ignored, and rates need not necessarily be based on the cost of the service alone;

9) the necessity of undertaking cost analysis, so that the cost of individual services may be covered and reflected as far as possible;

10) a harmonious rate structure reflecting the value of each service;

11) uniformity with a view to equality of use;

12) uniformity with a view to simplicity:

13) no exaggerated competition leading to dispersal or inefficiency of the various services provided.

The Recommendation D.10, governing the general tariff principles for the international public data transmission service over public data networks, enumerates also a number of factors which account must be taken in establishing tariffs for their type or service. These factors are :

1) the provisions of Recommendation D.5;

2) tariff relationships with other services provided by the administrations;

3) flexibility, enabling new needs to be accommodated as the service develops;

4) maximum simplicity from the administrative viewpoint;

5) the geographical configuration of countries:

6) not impart undue advantage or disadvantage to any category of user;

7) encourage customer choice, depending upon their needs, as to the use of circuit or packet-switched services where the alternative exists;

8) encourage the use of the public data network, meeting the needs of as many users as possible, and promoting optimum growth and utilisation of the network;

9) be easily understood by subscribers;

10) sustain the service on a long-term basis.

Another important Recommendation that administrations should take into account when establishing telecommunication tariffs is Recommendation D.140 covering accounting rate principles. Study Group 3 adopted quite recently the Recommendation D.140 establishing the principle that accounting rates underlying international telephone charges should be *cost-oriented*. While accounting rates are not the same as the collection rates actually charged to the users, it is believed that the cost-orientation principle contained in the Recommendation will, in time, positively affect user charges taking into account the national situation of the countries concerned.

This rapid review of the present situation with regard to tariff principles adopted within ITU for the establishment of telecommunication charges can be summarised as follows :

- One of the purpose of the Union is to foster collaboration among its members with a view to establishment of rates at levels as low as possible.

- Member countries should recognise the rights of the public to correspondence and also that the services, charges and safeguards shall be the same for all users in each category of correspondence without any priority of preference.

- The level of the charge is a national matter. However, in establishing these charges, administrations should try to avoid a too great dissymetry between the charges applicable in each direction of the same relations.

- The necessity of undertaking cost analysis, so that the cost of individual service may be covered and reflected as far as possible.

- The possibility of cross-subsidisation cannot be ignored and rates need not necessarily be based on the cost of service alone (Universal Service).

- Liberalisation of conditions for the use of international leased circuits.

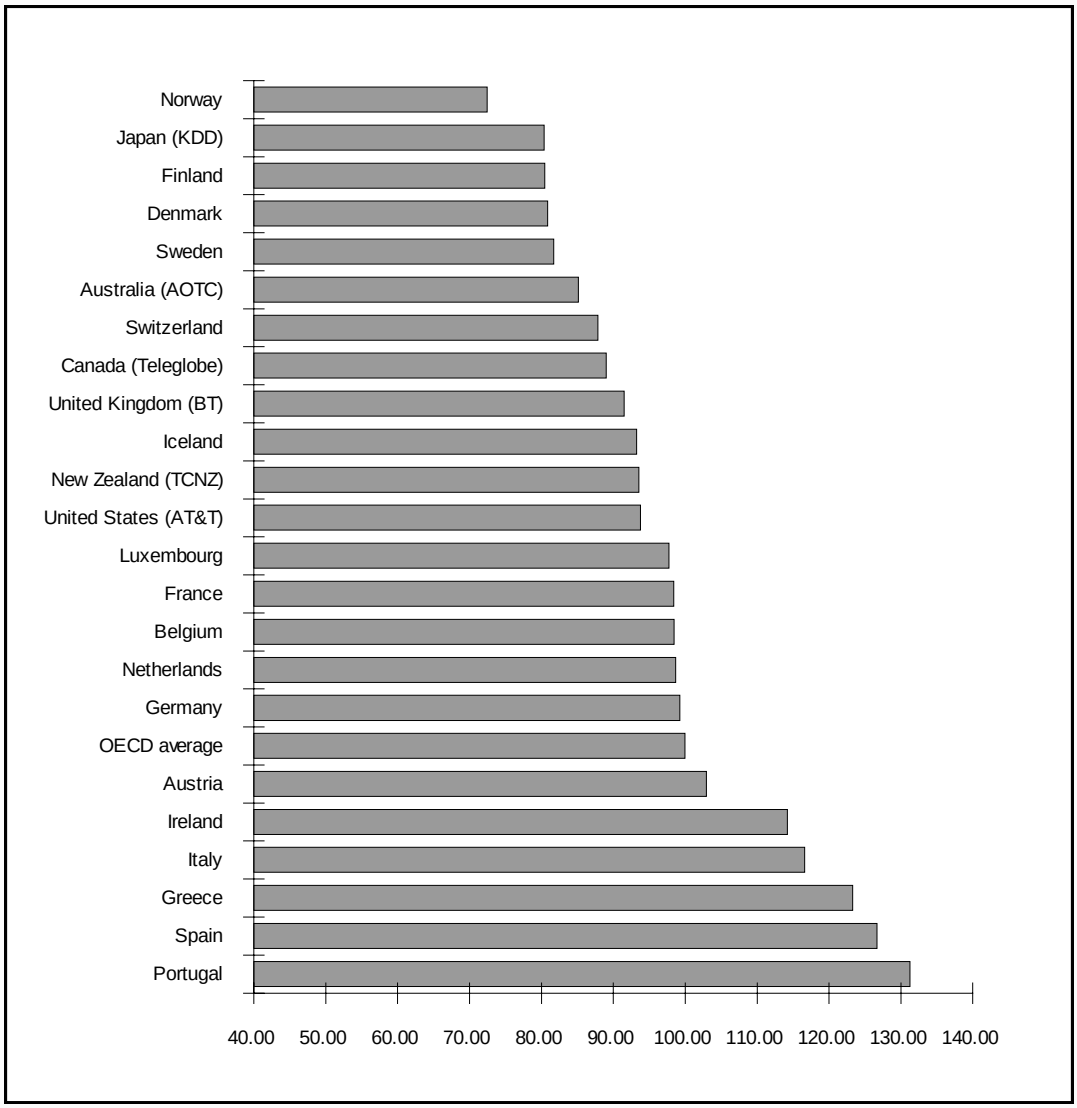
13.5.3 Are telecommunications tariffs too high?

One of the central issues that needs to be assessed when establishing a tariff structure is whether or not telecommunications tariffs are too high. This can be broken down into three subsidiary questions:

- why do telecommunication tariffs vary so widely between countries?
- is the level of profitability achieved by PTOs unjustifiably high?

- are telecommunication tariffs too high as a percentage of personal income?

Figure 13.5: Comparative international telephone call charges between OECD countries, January 1992



Source: OECD tariff comparisons database.
Note: The basket is based on a call-pair methodology using Purchasing Power Parity exchange rates (PPPs). The call charges exclude tax and are indexed so that the OECD average equals 100.

For the first question, there is clear evidence of a wide variation in the cost of making the same call from different countries. Looking just at the OECD countries, the price of a basket of international calls varies from 72 per cent of the OECD average in Norway to more than 130 per cent in Portugal. Many bilateral calls, such as those between Australia and Belgium or between the UK and Spain, cost less than half as much as the same call made in the opposite direction. Such disparities reflect the fact that some countries are rebalancing their tariff structure and cutting international call charges at a faster rate than others.

However, it is unlikely that such large differences in the price of making international calls will continue, because:

- Subscribers are making increasing use of call-back, country direct, freephone and calling card services to make use of advantageous tariffs offered by some operators;

- Many countries are liberalising the resale of international leased line capacity thus allowing new companies to enter the market for capacity resale;

- The advent of global mobile satellite telephones in the latter part of this decade will offer an international service which is fully distance-independent and this will add to the downward competitive pressure on tariffs for terrestrial services.

These three factors should tend to bring the prices offered by international service providers closer in line with a global average and should reduce the large disparities which have been seen in recent years.

At a national level, the range of differentials in prices is much greater. However, comparisons are difficult because of fundamental differences in tariff structures, living standards, exchange rates, calling patterns, infrastructure costs, tax systems etc. To make effective comparisons, it is necessary to devise a basket of different calls of different distance and duration made at different times of day or week and also including access charges and tax. Research carried out at OECD[1] indicates that these variations between countries are increasing over time, particularly in the newer services such as mobile communications and leased lines.

Moving to the second question -- *is the level of profitability achieved by PTOs unjustifiably high?* -- the answer appears to be: "it depends where you look!" Figure 13.6 shows 1992 data for the level of profitability for more than 200 PTOs across the globe. The overall net margin of profitability is around 10 per cent of revenue with a further 5.6% being paid to governments in tax. Relatively few PTOs in the world make a loss. These average figures show an industry which is successful without being excessive. Certainly they contrast favourably with the high losses generated by other similar global industries such as airlines, steel making, car manufacture, etc.

However, if one looks in detail, it is clear that some PTOs are much more profitable than others. The low income countries (mainly in Africa, China and the Indian sub-continent) achieve an average level of profit on telecommunications operations which is more than three times that of the world as a whole, despite the fact that they gain less than US$3 per person per year from their inhabitants. This apparent paradox can be explained by the fact that the relatively few people within these countries who have access to telecommunications services can afford to pay high prices. Furthermore, a considerable proportion of the income comes indirectly from the accounting rate system. In Latin America and the Caribbean, for instance, settlement charges paid by US carriers alone amount to more that 10 per cent of overall national telecommunication revenues and more than 30 per cent in nine countries of the region. Another factor is that low income country PTOs pay relatively little tax (just 2.2% of revenue) although as many of these PTOs are state-owned, the profits go directly to the state. In theory, these low income PTOs should have the lowest level of profitability because they should be operating major investment programmes. However, this does not appear to be the case. Rather it appears that governments in these countries prefer to use the telecommunications sector as a cash cow to pay for other parts of the economy and projects unrelated to telecommunications

The PTOs of the lower middle income countries, which include parts of Eastern Europe, some Asian countries and some of the richer African nations, achieve a relative high level of profitability, but also pay the highest proportion of taxes. In these countries, the financial relationship between the PTO and the state is more transparent, but still an inadequate percentage of revenue is being invested and too high a percentage is being declared as profit.

The countries with the lowest level of apparent profitability are the high income countries, though even here the figures achieved (15 per cent operating surplus; 9 per cent net profit) would be the envy of other industries. One of the reasons that profitability is lower in these countries is because market competition is permitted in many of the most economically significant countries in this group including Australia, Canada, Japan, New Zealand, Sweden, the UK and the USA. Also, the financial relationship between the operator and the state is more transparent. These two factors have acted to keep prices at a lower level in these countries than would otherwise be the case.

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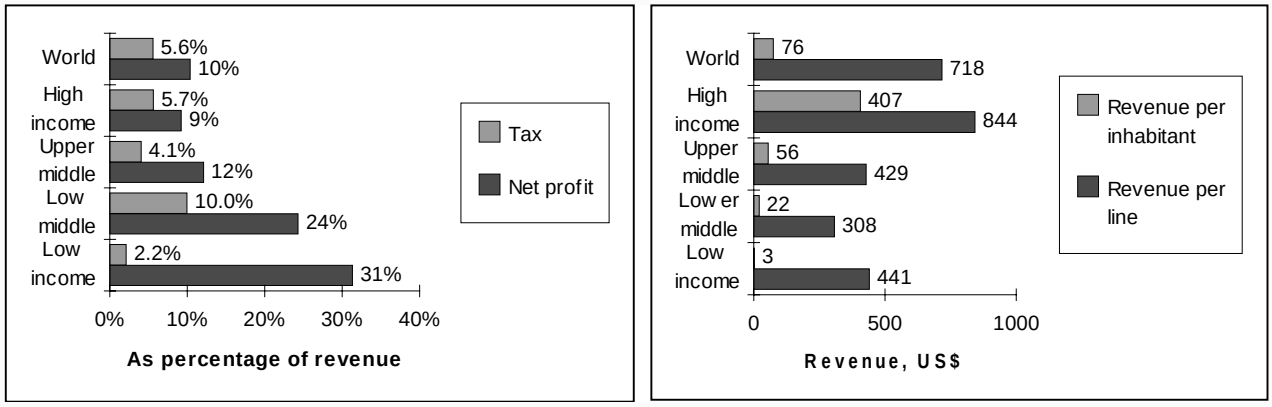
[1] See, for instance, OECD, 1993 Communications Outlook, Paris, 156pp.

Figure 13.6: Profitability, tax and revenue of public telecommunications operators, by income region, 1992



Note: Low income covers 54 countries with GDP per capita below US$600 per year.
Lower middle income covers 55 countries with GDP per capita between US$600-2'500 per year.
Upper middle income covers 44 countries with GDP per capita between US$2'500-10'000 per year.
High income covers 67 countries with GDP per capita above US$10'000 per year.
Source: ITU, *World Telecommunication Development Report,* 1994

The third question raised at the start of this section -- *are telecommunication tariffs too high as a percentage of personal income?* -- can be best answered by looking at the relationship between average tariff levels and living standards. Again the simple answer to this question is: "it depends where you look." For instance, in Central and Eastern Europe, the cost of a basket of residential telephone charges ranges from 0.2 per cent of GDP per capital in Bulgaria to 8.6 per cent in Kyrgyzstan. Similarly, the cost of a business telephone connection (one-off installation charge) ranges from just US$ 13 in Kyrgyzstan to US$ 1 274 in Slovenia. In Figure 13.7, one key indicator of tariff structure (the cost of a monthly line rental for residential subscribers) is taken to illustrate the variations between countries within the region and to compare them with selected OECD countries. The range again is quite remarkable: from just US$ 0.08 per month in Albania to US$ 6.87 in Slovenia.

Clearly part of the difference is due to the fact that, at least in the CIS, the buying power of the local currency is rapidly eroded by inflation which is reflected in the official exchange rate. Nevertheless it is possible to pick out a number of different types of tariff policy within the region:

- Countries which have retained a traditional tariff structure. This is usually marked by low rental charges, local calls which are either free or minimal in value, high long distance charges and very high international tariffs. These countries include Albania, Bulgaria, Romania and the CSFR.

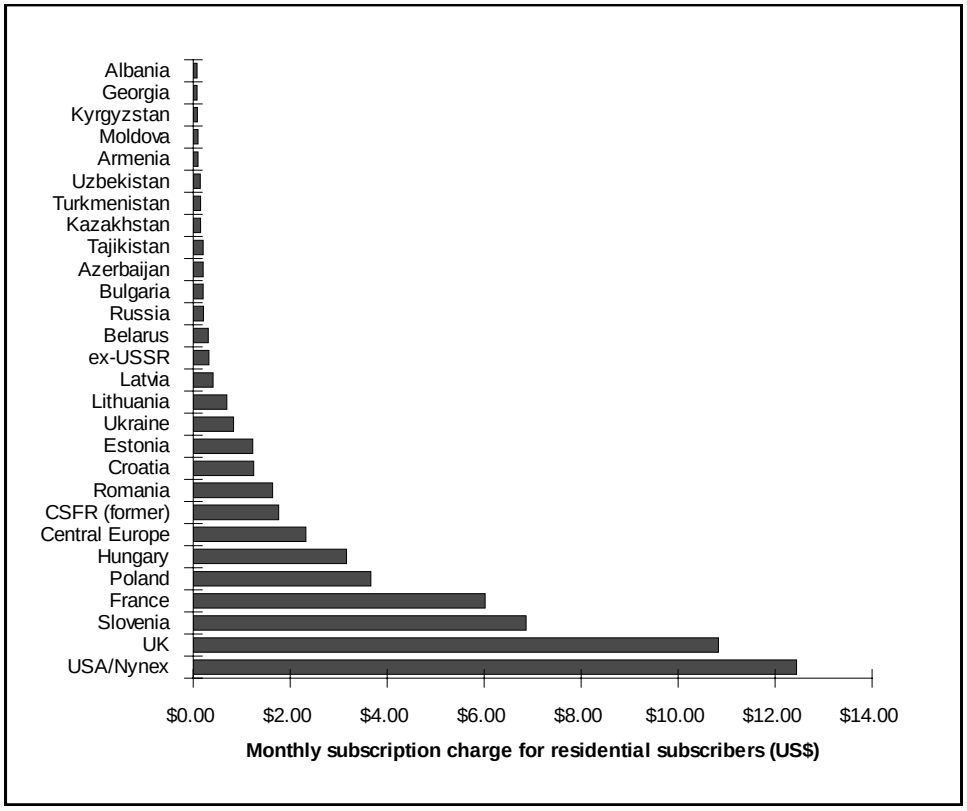
- Those countries which have raised their tariffs markedly but which have been rapidly overtaken by inflation and, because of bureaucratic delays in setting new tariffs, have not been able to change tariffs at a sufficiently rapid rate. These countries include Russia which, in 1991 raised the business connection charges from 100 to 8 000 Roubles. At average 1991 exchanges rates this was worth some US$ 3 636, or approximately twice the cost to the operator of installing a new line. However, by 1992, inflation had eroded this value to just US$ 41 which is well below the value needed for a realistic payback of investment. Other Republics of the former USSR are in a similar position.

- Those countries which have raised their tariffs and have succeeded in maintaining their value relative to inflation. These countries include Hungary, Slovenia and Croatia, and the Baltic States.

The effect of these differing tariff structures is evident also in the level of revenue per main line. The countries which have gone furthest towards rebalancing their tariff structures (Hungary and Slovenia) also have the highest levels of revenue per line (US$ 429 and US$ 287 respectively). By contrast in the former USSR Republics, revenue per line is just US$ 10 per year at average 1992 exchange rates.

Figure 13.7: The cost of owning a telephone

Comparative charges for monthly telephone line rental in Central and Eastern Europe and in selected OECD countries, in US$, end 1992



Source: ITU/OECD (1994) Telecommunication Indicators for Economies in Transition in Central and Eastern Europe.

13.6 Summary

The analysis presented in this chapter has attempted to show the steps that an operator must take when establishing a new tariff structure, either for the introduction of a new service or to modify or rebalance the tariff for an existing structure. Section 13.1 examined some of the theoretical functions that a price should fulfil. Section 13.2 showed how the tariff structure of an operator is related to its revenue flow and examined recent trends. Section 13.3 presented a review of the options for setting access charges, i.e. installation fee and subscription fee. Section 13.4 looked at call charges and examined why these might differ between countries at both the national and the international level and presented a methodology for making comparisons between countries. Finally section 13.5 looked at the role of the ITU in producing Recommendations guiding tariffs for international telecommunications service. The chapter has presented options rather than attempting to dictate how to do it. The rationale for this is because any tariff structure must necessarily be predicated on certain basic choices at the level of national social and economic policy (see Table 13.3). For this reason, tariff structures have traditionally been viewed as a national prerogative. Nevertheless, there is a lot that can be learned from observing the tariff structures of other countries and copying successful formulae for the introduction of new services. The ITU provides a suitable multi-lateral forum in which this observing and learning process can be nurtured.