

2. The cost of international telephone calls

The retail price which users pay for international telephone calls is linked, although sometimes loosely, to the cost of constructing and maintaining the underlying infrastructure. Our review of price trends for international telephony therefore begins by estimating these costs (1) directly, by looking at cost trends for intercontinental cable and satellite circuits and the domestic costs for originating and terminating international calls; and (2) indirectly by looking at proxies for these costs, such as wholesale capacity prices and accounting rates.

2.1 Infrastructure costs

An international telephone call flows over various types of infrastructure. When an international call is made, it is generally routed over a subscriber's telephone line to a local exchange (the "local loop") and is then passed on to an "international gateway" for transmission to its destination (see Figure 2.1). Up to this point, the telephone call remains within the national network of the country from which the call was placed. The call is then routed over an "international link"—typically satellite or undersea cable, but perhaps terrestrial cable or radio (e.g., microwave) for traffic to adjacent countries—to its destination. When the call reaches the destination country, the process is reversed: it goes from the international gateway, to the local exchange and on to the telephone line of the person

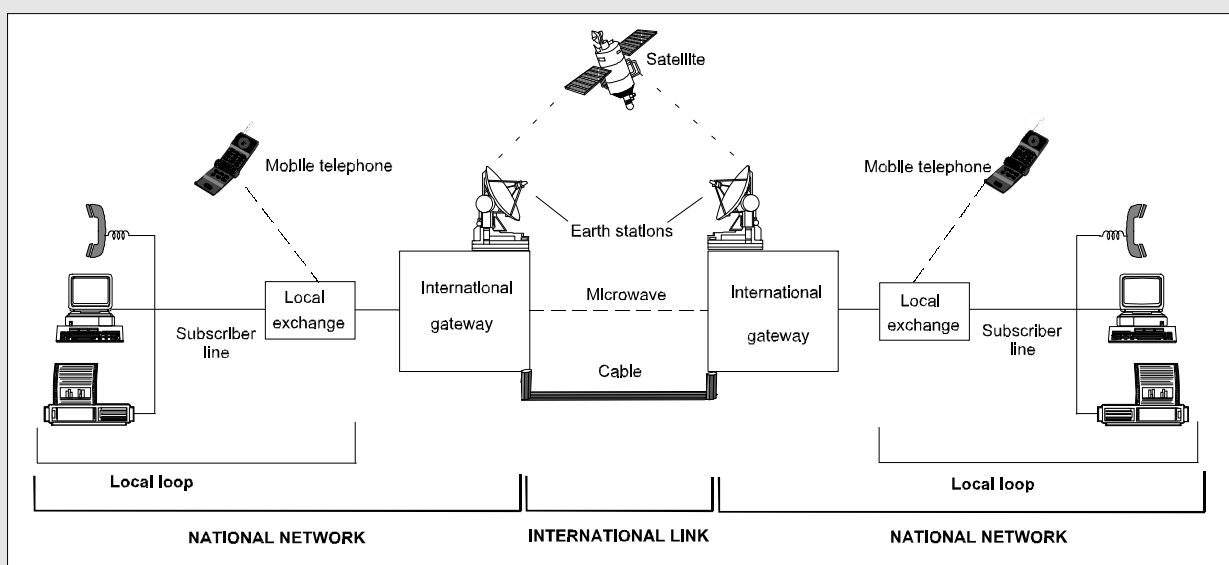
for whom it is intended. The call flows over three distinct types of infrastructure: the international link, the international gateway and the local loop. The costs of each of these components form the basis for the price of an international call.

2.1.1 International link costs

The costs of international infrastructure using undersea cable and satellites have been dropping dramatically due to ever increasing capacity coupled with sophisticated means for data coding and compression. When the TransAtlantic One (TAT-1) cable was completed in 1956, it cost US\$ 50 million with a capacity for 89 simultaneous telephone calls (voice paths). Each voice path cost around US\$ 600'000. The TAT-10, launched in 1993, had a capacity for over 113'000 simultaneous telephone conversations (with compression) with each voice path costing around US\$ 2'650 (see Figure 2.2). For the TAT-12/13 cable launched in 1995, some 600'000 voice paths are available at less than US\$ 1'000 each.

Looking only at the construction costs for international cable and satellite systems, the per minute cost is less than one hundredth of a US cent over the lifetime of the infrastructure. Operating expenses should be included for a more accurate figure for the per minute cost. Table 2.1 calculates the cost of an INTELSAT satellite including

Figure 2.1: Infrastructure for an international telephone call

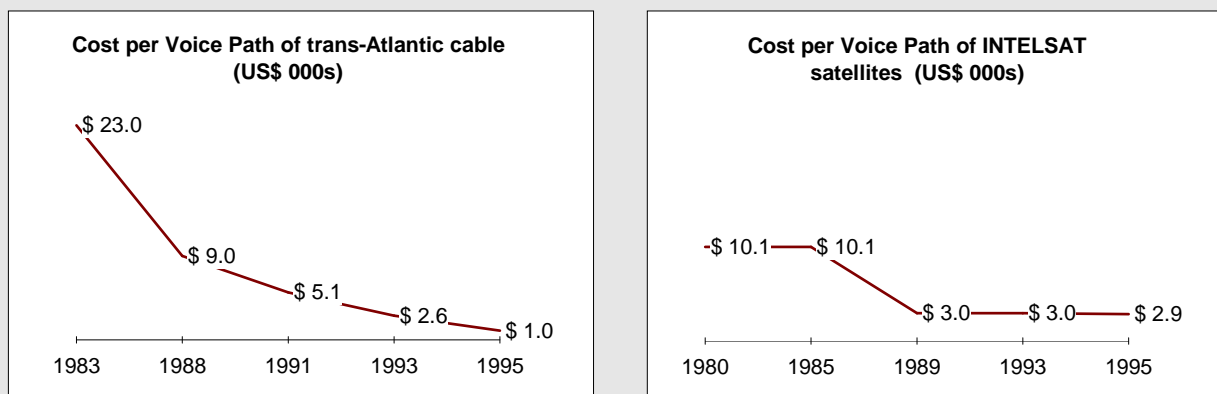


Note: Subscriber could also have wireless access either directly to the international gateway, or passing through the local exchange. In some countries, digital overlay networks have been established which link the subscriber directly to the international gateway, bypassing the local loop.

Source: ITU.

Figure 2.2: Towards zero

Cost per voice path of trans-Atlantic telecommunication cables and INTELSAT satellites



Note: Construction costs divided by number of voice paths. Figures are for construction costs only, including capital costs, and do not include operating costs. INTELSAT costs are in constant dollars.

Source: ITU adapted from OECD and FCC data.

operating expenses. The result is a per minute cost of less than US\$ 0.01¹. Since the cost of an international link is effectively close to zero, it could almost be dismissed as having no bearing on the cost of an international call. What drives up the costs of cable and satellite systems are the distribution layers that each in turn mark-up the price.

2.1.2 National network costs

One approach for determining the cost of the national telecommunication infrastructure necessary for originating and terminating international calls would be to price the

various **components**—telephone exchanges, transmission equipment, cables—that make up the network. Apart from the obvious effort this would require, the costs would be difficult to determine due to a variety of factors:

- National networks are used for purposes other than just international telephone calls. Indeed, international calling may account for very little of the usage of the national network by most customers. Hence developing a cost attribution methodology for international calls is problematic. Furthermore in most countries, it is almost impossible to determine the impact of international calls

Table 2.1: Satellite costs

Costs for INTELSAT satellite

Year	1993	
System	INTELSAT VII	
Maximum life	10-15 years	
Capital cost (US\$ m)	276	Cost for one satellite including estimated US\$ 197 million for construction plus estimated cost of capital of 40 per cent.
Operating expenses (1993, US\$ m)	17	Including depreciation, divided by 19 satellites.
Nominal capacity (Circuits)	18'000	
Total capacity (Voice paths)	90'000	5:1 compression with Digital Code Multiplication Equip.
Costs per year (US\$):		Assuming lifetime of 12.5 years.
Circuit	2'167	
Voice path	433	
Per minute	0.003	Minutes multiplied by the number of voice paths (assuming 25 per cent utilisation).

Source: ITU adapted from OECD, INTELSAT.

on overall costs due to a lack of cost separation between international and national services.

- Equipment prices and detailed construction costs are difficult to obtain. Many equipment manufacturers are reluctant to provide list prices which, in any case, are not a reliable as an indicator of prices actually paid. Furthermore, capital expenditure data for public telephone operators rarely go into the level of detail necessary to identify the separate costs of national and international infrastructure.
- Investment costs vary widely between countries. The physical size of the country, number of subscribers, relative price levels and procurement practices of the PTO all influence investment costs.

An alternative way to examine the cost of a telephone call would be to examine **network operating expenses**. This has several advantages. First operating expenses make up the bulk of the cost of a telephone call and, because they include depreciation, there is an implicit equipment expenditure component. Second, operating expenses are more readily available and comparable across countries than investment data. Third, an international call is effectively a national call until it reaches the international gateway. By factoring in total network traffic—local, domestic long distance and international—the cost of a minute of telephone traffic within the national network can be determined.

Table 2.2 shows the cost per minute of telephone traffic for selected countries. The telephone traffic includes local, national long distance and international incoming and

outgoing call minutes. Costs are based on operating expenses which include depreciation of fixed assets. It is hard to spot any clear relationship in the cost per minute of call for the countries shown in the table. Costs range from a high of US\$ 0.33 in Switzerland to US\$ 0.02 in Honduras and Jordan. The only obvious relationship is for minutes per subscriber: in general, the higher this value the lower the operating cost per minute suggesting some degree of economies of scale. It is also interesting to note that the price of a local call is also related to the cost per minute of traffic (see Figure 2.3).

Other factors appear to have little bearing on costs. For example, it might be assumed that wealthier countries would have higher relative operating expenses due to higher wage costs and construction expenses. This appears to be the case for Switzerland which is the richest country in the sample group and has the highest cost per minute. However Israel and Spain, the next wealthiest countries, have lower costs than Gambia, which has one fifteenth of their GNP per capita. The share of international traffic also appears to have little impact on costs: international traffic accounts for the same share of traffic in Jordan and South Africa yet costs in South Africa are more than six times greater than in Jordan. Other factors, such as the size of the network or country appear to have little influence on costs. The explanation for differing costs lies more in the operational cost structure—staff expenses, depreciation schedules and accounting systems—rather than external factors such as national income level or network size.

Interconnect prices also provide an idea of how much it costs to originate or terminate a call in the national network.

Table 2.2: Operating costs in the national telephone network

Operating cost per minute of telephone traffic, selected countries

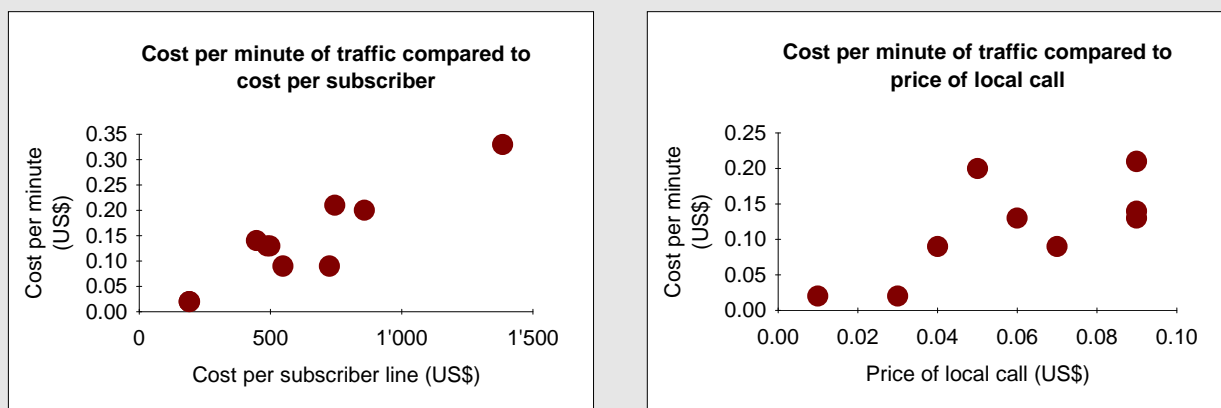
Country	Year	Operating cost per minute (US\$)	Minutes per subscriber line	Share of international traffic to total	GNP per capita (US\$) 1994	Price of local call (US\$) (3 minutes)
Bahrain	1994	0.20	4'278	25%	12'070	0.05
Brazil	1993	0.09	1'332	1%	5'630	0.04
Gambia	1993	0.21	3'542	24%	1'150	0.09
Honduras	1993	0.02	9'001	11%	1'900	0.01
Hungary	1994	0.13	3'800	7%	6'310	0.09
Israel	1993	0.09	7'697	3%	15'690	0.07
Jordan	1993	0.02	1'250	4%	4'290	0.03
S. Africa	1993	0.13	3'637	4%	3'010	0.06
Spain	1994	0.14	3'198	4%	14'040	0.09
Switz.	1994	0.33	4'227	17%	24'390	0.22
Average 1/		0.13	4'506	4%	7'057	0.08
Average 2/		0.13	5'699	12%	7'125	0.06
Median		0.13	4'252	6%	5'970	0.07

Note: 1/ Weighted average. 2/ Simple average.

Source: ITU World Telecommunication Indicators Database.

Figure 2.3: Spot the relationship

Relation between operating cost per subscriber, price of local telephone call and cost per minute of traffic, US\$



Note: Data points refer to economies shown in Table 2.2.
Source: ITU Telecommunication Indicator Database.

Interconnect charges are payments made between operators to transfer calls over each others' networks within the same country. Table 2.3 shows average interconnect prices charged by a selection of operators for transferring traffic over their networks. It is notable that the interconnect charges are significantly lower than the operating cost per minute shown in Table 2.2. The median operating cost per minute was US\$ 0.13 whereas the median interconnect charge is US\$ 0.04. One reason is that operating costs contain items unrelated to the transmission of telephone calls (e.g., wireless and data communications services). Interconnect charges on the other hand are typically the result of arduous negotiations between operators based on detailed cost data and thus more closely related to the actual cost of conveying a telephone call.

It is also worthwhile to try to determine the cost of an international telephone call by examining the expenses of operators that provide **international telecommunication services only**. This allows the cost of the international component of national networks to be identified separately. Table 2.4 shows the operating cost per minute of international telephone traffic (both ways) for selected international operators. Depreciation is included in operating costs in order to reflect construction costs. Interest and other expenses are excluded. The table shows a wide variation in the per minute operating cost ranging from US\$ 1.48 for Dacom (Rep. of Korea) to US\$ 0.08 for Tele2 of Sweden. The figures are generally higher than the national per minute data in Table 2.2. This would appear to confirm that it costs more to provide international telephone calls. After all, international calls require extra infrastructure such as lease or partial ownership of satellite and cable systems, satellite earth stations and cable landing centres and international telephone exchanges. However an examination of the structure of the operating expenses reveal inconsistencies suggesting that the cost of an international call may be lower than it appears.

Interconnection charges certainly vary widely. Telecom Denmark has the lowest interconnect charges (US\$ 0.04 per minute). This might be explained by the fact that it pays the charges to "sister" companies which, like Telecom Denmark, form a part of the TeleDenmark group. On the other hand, Telintar of Argentina pays the highest interconnect charges of US\$ 0.84 per minute (ten times more than the price of a local telephone call), yet it is also jointly owned by the two operators to which it pays these charges. There is a significant difference in interconnect charges for most of the international operators (shown in Table 2.4) from the average cost per minute for calls (shown in Table 2.2) and the interconnect charges (shown in Table 2.3).

On the other hand, except for Japan, transparent costs such as administration (including staff costs), maintenance and depreciation show less of a variation between countries.

Table 2.3: Interconnect charges

Average interconnect prices, US\$ per minute, 1995

<i>Operator</i>	<i>Price per minute</i>
BT (UK)	\$ 0.017
Bell Atlantic (USA)	\$ 0.021
Telstra (Australia)	\$ 0.037
Telia (Sweden)	\$ 0.038
NTT (Japan)	\$ 0.068
Telecom New Zealand	\$ 0.073
Simple average	\$ 0.042
Median	\$ 0.038

Source: Ovum².

DIRECTION OF TRAFFIC

Table 2.4: Operating costs of international telecommunication operators

Operating costs per minute of international traffic, selected international telecommunication operators, US\$

Country (operator)	Year ending	Operating cost per minute of international telephone traffic (US\$)					
		Total	Of which:				
			Inter-connect	Admin-istrative	Maint-enance	Depre-ciation	Total
Argentina (Telintar)	30.09.94	1.19	0.84	0.09	0.01	0.03	0.12
Canada (TeleGlobe)	31.12.94	0.14	...	...	...	0.06	...
Denmark (Telecom)	31.12.94	0.30	0.04	0.07	0.05	0.07	0.19
India (VSNL)	31.03.94	0.21	...	0.01	...	0.02	...
Indonesia (PT Indosat)	31.12.95	0.48	0.23	0.14	0.02	0.04	0.20
Japan (KDD)	31.03.95	1.41	0.25	0.16	0.20	0.28	0.64
Korea (Dacom)	31.12.94	1.48	...	0.15	...	...	...
Sweden (Tele2)	31.12.95	0.08	...	...	...	0.01	...
Simple average		0.66	0.34	0.10	0.07	0.07	0.29
Median		0.39	0.24	0.11	0.03	0.04	0.19

Note: ... indicates that no separate figure is available for that category. Operating costs per minute include outgoing and incoming traffic.
Source: ITU/BDT PTO Indicator Database, Company reports.

Apart from interconnect, the major difference in costs between countries is "other" costs. These can include license fees, advertising and taxes, all of which vary widely

between countries. A more comparable basis for the international portion of a national call would be to exclude interconnect and "other" costs arriving at an median cost

Box 2.1: The cost of advertising

One reason for encouraging competition in international telephone service is to achieve lower prices. However competition can raise costs because of increased expenditures for advertising and marketing. New competitors advertise to make themselves known to the public while incumbent operators advertise to minimize market share loss.

The amount spent on telecommunication advertising can be significant. AT&T spent almost 14 per cent of its operating costs on marketing in 1994. Most of the United States major long distance and Regional Bell Operating Companies are among the top 100 advertisers (measured by the amount spent on

advertising). Operators from developed countries are not the only ones advertising; PT Telkom of Indonesia spent almost US\$ 50 million on marketing in 1995.

Advertising has implications for telecommunication policy-making. For example, money spent on advertising may be at the expense of infrastructure development or modernization. Also, the promise of lower prices through competition may be offset by higher operational costs for advertising. But, advertising can be effective: BT claims that its "It's good to talk" advertising campaign helped stimulate more than one billion extra residential calls.

Box Table 2.1: Telecommunication advertising

Marketing expenses for selected operators

Operator	Year	Amount (US\$m)	As per cent of	
			Operating costs	Operating revenue
AT&T (USA)	1994	\$ 4'163.78	13.5%	11.3%
Deutsche Telekom	1995	\$ 652.48	1.8%	1.4%
PT Telkom (Indonesia)	1995	\$ 49.28	3.1%	2.2%
Swiss Telecom PTT	1995	\$ 140.44	5.1%	1.6%
Telintar (Argentina)	1995	\$ 21.80	4.4%	3.4%

Source: ITU adapted from company reports.

of US\$ 0.19 per billed minute. Added to the median cost of a national telephone call (shown in Table 2.2), the median cost per minute of international call is estimated to be around US\$ 0.35 maximum. Considering that roughly a third of operating costs are covered by subscriber fixed charges (connection, rental) then **the average cost of an international call is probably around US\$ 0.25 per minute.**

2.2 Cost proxies

Another approach to estimating the cost of an international call is to consider proxies where prices are closer to costs than typical customer tariffs. These include international leased lines, call-back and accounting rates.

2.2.1 International private lines

International private lines (IPLs) are rented to users who need to transport large quantities of traffic. Many countries limit the use of IPLs to connecting private networks (e.g., two branch offices of a company) or to connect Internet nodes and do not permit interconnection with the public telephone network. In reality, this restriction is increasingly circumvented. Indeed, all of the resellers and some of the call-back operators in the United States use IPLs to provide their services. One would assume that the flat-rate charges of IPLs are closer to costs than per-minute prices, but some telecommunication operators have been raising the price of IPLs recently to offset the loss of customers to resellers.

Table 2.5 shows the per minute price of an international private line between the United States and selected countries. The prices fall within the range of those calculated by using operating costs in the preceding section. Greater price reductions are available with higher bandwidth leased lines (e.g., 2 Mbit/s).

2.2.2 Call-back

Wholesale prices are also reflected in call-back prices. Call-back operators purchase large quantities of capacity at discounted prices, where this is available, enabling them to offer lower cost international telephone services. Where it is not available, call-back operators exploit the difference between the price of outgoing and incoming calls on a particular route or deliver traffic via a third country. Call-back prices are more significant than IPL prices since call-back makes discounted international calls available to a wider group of customers. Table 2.6 shows call-back prices for selected countries for a one minute telephone call to the United States.

In most instances the call-back rate is related to the settlement rate (one half the accounting rate). This is logical since the settlement rate must be paid to the terminating carrier and provides a platform below which prices cannot fall without losing money. Thus the settlement rate rather than actual costs appear to form the basis of call-back prices even though this may be an artificial price. It also suggests that the wholesale price paid by call-back operators is close

Table 2.5: International private line rental

Monthly rental prices for 64 kbit/s digital private circuits with the United States, US\$, 1994

Country	Monthly rental	US half	Total	Price per minute
Australia (Telstra)	5'330	8'050	13'380	0.31
Austria	6'965	3'400	10'365	0.24
France	3'161	3'400	6'561	0.15
Greece	7'812	3'400	11'212	0.26
Ireland	3'660	3'400	7'060	0.16
Japan (KDD)*	8'219	4'400	12'619	0.29
Singapore	5'531	8'400	13'931	0.32
Turkey*	26'578	3'400	29'978	0.68
UAE	4'290	4'500	8'790	0.20
UK (BT)	3'629	3'400	7'029	0.16
Average	7'517	4'575	12'092	0.28
Median	5'430	3'400	10'789	0.25

Note: Local end charges included except for countries marked *. US half is for AT&T with line originating/terminating in New York. Per minute cost assumes 4:1 compression and 25 per cent capacity utilisation.

Source: ITU, adapted from TARIFICA data.

to the accounting rate, leaving little margin. There are cases where the call-back price is less than, or equal to, the settlement rate (Japan, Nigeria, Spain). This might be explained by the resale of capacity on international private lines with these countries, bypassing the accounting rate

Table 2.6: Call-back

Price of a call back call from the country listed to the United States, US\$ per minute, June 1996

	Call-back rate	Settlement rate a)	Difference (US\$)	Diff. (%)
Brazil	0.69	0.56	0.13	23%
Guatemala	0.87	0.54	0.33	61%
India	0.97	0.90	0.07	8%
Israel	0.85	0.55	0.30	55%
Japan	0.39	0.46	-0.07	-15%
Nigeria	0.75	0.75	-	0%
S. Africa	0.64	0.60	0.04	7%
Spain	0.49	0.51	-0.02	-4%
Switzerland	0.37	0.26	0.11	42%
Thailand	0.78	0.75	0.03	4%
Average	0.68	0.59	0.09	18%
Median	0.72	0.56	0.06	7%

Note: a) One half the accounting rate. When multiple accounting rates are listed, the lowest rate is used.

Source: New World Telecommunications, FCC.

Table 2.7: Accounting rates*Selected accounting rates for the United States and United Kingdom, US\$ per minute*

	US			UK		
	1991	1995	Change	1991	1995	Change
Australia	0.97	0.59	-39%	1.00	0.57	-43%
Canada	0.28	0.24	-14%	...	0.30	
France	1.43	0.54	-62%	0.47	0.37	-21%
Germany	1.43	0.39	-73%	0.60	0.47	-21%
Greece	2.19	1.26	-42%	0.68	0.63	-8%
Italy	2.04	0.71	-65%	0.58	0.58	-1%
Japan	1.62	0.94	-42%	2.00	1.49	-26%
Mexico	1.16	0.91	-22%	2.10	1.78	-15%
Netherlands	1.29	0.59	-54%	0.48	0.43	-9%
Spain	2.15	1.78	-17%	0.59	0.63	6%
Switzerland	1.16	0.74	-36%	0.51	0.31	-39%
US				...	0.37	
UK	0.97	0.37				
Average	1.39	0.76	-46%	0.75	0.66	-12%

Source: FCC, OFTEL.

system. There are also allegations that facilities-based operators in the United States—the location of most call-back providers—are offering wholesale prices to call-back providers at below cost in order to recoup their costs on a greater share of incoming traffic through the principle of proportional return. Perhaps the greatest significance of call-back is that it tends to exert downward pressure on costs. Many operators have been reducing accounting rates and lowering prices recently to offset call-back usage.

2.2.3 Accounting rates

Accounting rates are intended to reflect the costs of terminating an international telephone call. They are bilateral arrangements where operator A agrees to pay operator B an amount for terminating operator A's traffic and *vice versa* (see discussion in Box 3.1). On the one hand, accounting rates are simple and attractive to the contractual parties since they gain equivalent shares of the revenue generated by traffic. As long as the traffic is equivalent, the net result is the same. However, as shown in the preceding sections, national operating costs per minute of international telephone traffic vary widely. Therefore it is unrealistic to assume that the costs of terminating a call will be the same between two countries.

Almost every operator in the world considers accounting rates confidential. However, two countries do publish accounting rates; the United Kingdom (currently for OECD relations only) and the United States. Table 2.7 shows accounting rates between the United States and selected countries.

Accounting rates are coming down over time. The reason has less to do with falling costs and more to do with the fact that accounting rates have been unrelated to costs for a long time³. This is evident from the comparison of costs calculated in the previous section with the accounting rates shown below. It is unfortunate that in many instances, accounting rates do not serve their intended purpose of reflecting the costs of originating and terminating calls within countries. If accounting rates really were accurate, they would find a new life as a measure for determining interconnection rates for new operators and for efficiency benchmarking.

2.3 Putting it all together

This overview of international telephone costs suggest that the distance between countries is generally irrelevant in determining costs. The real costs are in the national networks where the calls originate and terminate. Prices of international calls deviate substantially from the cost of providing the service and there is significant scope for price reductions (see Table 2.8). However due to differing national network costs, it is unrealistic to assume one worldwide cost for international calls. Rather it may be preferable for carriers in each country to publish a rate at which they will carry local calls to, or from, specific international gateways with volume or time sensitive (peak / off-peak) variations if desired.

While there is considerable variation in operating costs

Table 2.8: Putting it all together

Per minute costs / prices of an international call with the United States, US\$

	<i>Operating cost (a) 1994</i>	<i>Price of local call (b) 1994</i>	<i>Settlement rate (c) Jun.96</i>	<i>Call-back rate Jun.96</i>	<i>Collection charge 1995 (d)</i>	
					<i>Off-Peak</i>	<i>Peak</i>
Argentina	\$ 0.14	\$ 0.08	\$ 0.72	\$ 0.78	\$ 2.44	\$ 2.46
Australia	\$ 0.17	\$ 0.18	\$ 0.29	\$ 0.29	\$ 0.76	\$ 1.00
Brazil	\$ 0.13	\$ 0.04	\$ 0.57	\$ 0.69	\$ 1.33	\$ 1.66
Canada	\$ 0.10	\$ 0.00	\$ 0.10	\$ 0.20	\$ 0.15	\$ 0.39
Czech Republic	\$ 0.04	\$ 0.05	\$ 0.44	\$ 0.53	\$ 1.88	\$ 1.88
France	\$ 0.20	\$ 0.13	\$ 0.26	\$ 0.35	\$ 0.76	\$ 0.99
Greece	\$ 0.05	\$ 0.00	\$ 0.62	\$ 0.64	\$ 0.96	\$ 1.27
Indonesia	\$ 0.08	\$ 0.05	\$ 0.75	\$ 1.08	\$ 1.52	\$ 2.02
Israel	\$ 0.10	\$ 0.07	\$ 0.71	\$ 0.85	\$ 0.91	\$ 1.14
Korea (Rep.)	\$ 0.06	\$ 0.04	\$ 0.62	\$ 0.82	\$ 1.14	\$ 1.63
South Africa	\$ 0.11	\$ 0.06	\$ 0.60	\$ 0.64	\$ 1.23	\$ 1.64
UAE	\$ 0.14	\$ 0.00	\$ 0.83	\$ 0.92	\$ 0.82	\$ 1.48
Average	\$ 0.11	\$ 0.06	\$ 0.54	\$ 0.65	\$ 1.09	\$ 1.46
Median	\$ 0.10	\$ 0.05	\$ 0.61	\$ 0.67	\$ 0.96	\$ 1.56

Note: a) Per minute of traffic. Computed by dividing total operating costs by estimated volume of total traffic (local, national and international).

b) Some countries provide a certain amount of "free" local calls which are covered by the price of monthly subscription charges.

c) One half the accounting rate. In the case of multiple accounting rates, the average is used.

d) User tariff. Not all countries offer off-peak tariffs.

Source: ITU, FCC, New World Telecommunications.

which is largely independent of each country's income level, the cost of raising capital for infrastructure development can be significant for developing countries. Many developing countries have limited access to credit and tend to pay higher interest rates than developed countries. Also, unstable currencies can lead to significant foreign exchange losses, driving up costs. Furthermore, while the cost per minute appears low, countries must make significant up-front payments for equipment and leasing capacity in undersea cable and satellite systems. Most least

developed countries cannot afford direct links with more than a few countries resulting in higher costs from transit payments (see Box 2.2). And in many developing countries, revenues from international telephone calls account for a significant portion of the income necessary for expanding the national telecommunication infrastructure and for keeping local telephone service affordable (see Box 2.3). There are therefore often important economic, political and social considerations challenging the notion that international telephone calls should be cost-based.

Box 2.2: The cost of transit

Most of the economies covered in the statistical tables in this edition of *Direction of Traffic* generate sufficient traffic to warrant direct links with their main partners. However many of the world's least developed countries generate too little traffic to justify the expense of maintaining direct connections to a large number of countries. Instead they must route traffic to transit countries that in turn deliver the traffic to its intended destination. The country originating the call must make a transit payment to the country delivering the call, which drives up the cost.

The lack of direct connections is particularly acute in Africa. The case of Chad highlights the situation. It has only 16 international circuits, all with France. Of its 1.6 million minutes of traffic in 1995, 69 per cent was with France while 29 per cent transited through France (two per cent went to neighbouring Cameroon, but routed over national circuits). It is estimated that African operators pay between US\$ 400 - 1'000 million a year for transit payments. These extra transit payments can add between US\$ 0.55 - 1.75 per minute to the cost of a call (see table below) .

Box Table 2.2: Transit costs in Africa

Accounting rates between Africa and other regions, per minute, US\$

<i>To</i>	<i>Route</i>	<i>Accounting rate</i>	<i>Of which transit payment</i>
Africa	Direct	0 - 2.00	
	Transit/Africa	2.00 - 3.00	up to 1.75
	Transit/EU/US	3.50- 5.00	1.15 - 1.75
Europe	Direct	1.25 - 3.25	
	Transit	2.00 - 3.60	0.55 - 0.60
Americas	Direct	1.00 - 2.00	
	Transit	2.50 - 3.55	0.55 - 0.90
Asia	Direct	3.20	
	Transit	3.80	1.00 - 1.75

Source: Telecommunications Foundation of Africa.

Box 2.3: Developing countries and international telephone costs: debunking the myth

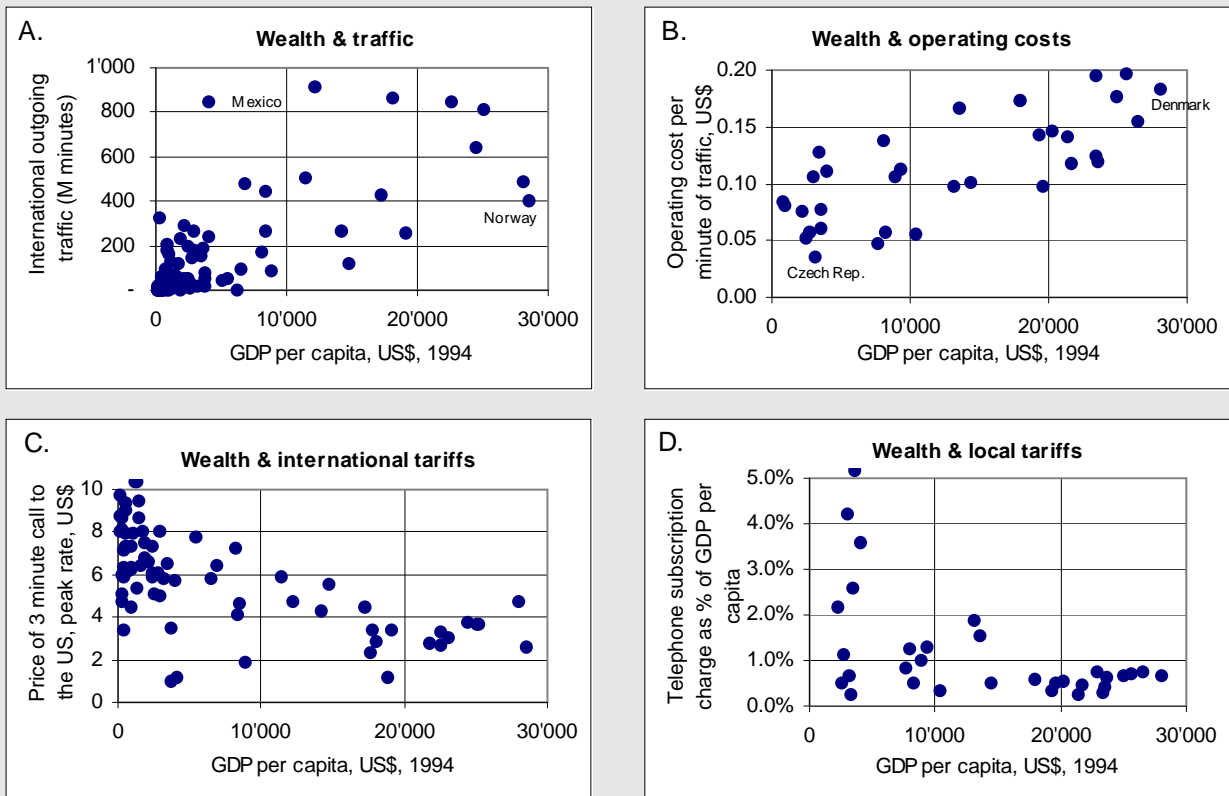
It is commonly assumed that developing countries incur higher costs in providing international telephone service. This argument is often put forth as a reason for relatively higher accounting rates and international tariffs in developing countries. One of the reasons given is that the volume of telephone traffic generated by developing countries is less than developed countries and therefore developing countries cannot benefit from economies of scale⁴. A study examining this issue found the cost per minute in developing countries to be two times higher than in developed countries⁵.

An analysis of recent data contradicts the theory about higher operating costs in developing countries. Chart A below shows the relationship between Gross Domestic Product (GDP) per capita and international outgoing telephone traffic. It is true that many lower income countries do not generate much traffic. However after above US\$ 5'000 per capita income, there is hardly any relationship between traffic volume and income. And a number of countries with relatively low incomes generate more traffic than wealthier countries. For example, Mexico generates twice as much traffic as Norway despite having a GDP per capita only a seventh as great. Reasons for large traffic volume have as much to do with population size, immigration and proximity of trading partners as wealth.

Even though most low income countries generate relatively little volume of traffic compared to richer countries, they do not have higher operating costs (see chart B below). In general, the wealthier a country, the greater its operating cost per minute of traffic. Denmark, with a GDP per capita of US\$ 28'000 in 1994, has operating costs per minute four times greater than the Czech Republic with a GDP per capita of US\$ 3'200. Despite relatively lower operating costs, international tariffs tend to be higher in developing countries (see chart C below). One reason is that the business sector, which can afford to pay more, is generally the biggest user of international telephone services. Another factor for higher international tariffs in developing countries is to discourage outgoing calls by means of capacity limitations. This might be done because of inability to pay settlement payments or to attract incoming calls which generate foreign exchange.

Perhaps the main reason for higher international tariffs in developing countries is to subsidise local service. Local telephone charges already tend to be relatively higher for developing countries than developed countries (see chart D). Lowering international charges might necessitate raising local charges, putting the telephone out of the reach of some people.

Box Figure 2.3: Wealth and international telephone calls



Source: ITU.

- ¹ “...the cost of a digital circuit on a 15-year term with INTELSAT, and equipped with DCME, represents less than two US cents per paid minute of a telephone call.” See OECD. 1995. *Satellite Communications: Structural Change and Competition*. Paris.
- ² For information of the methodology used to determine the interconnect charges see: Ovum. 1996. *An international comparison of interconnect prices*. On the World Wide Web at <http://www.ovum.com/interconnect>.
- ³ According to the ITU Recommendation dealing with accounting rates: “some accounting rates have not kept pace with the recent cost trends and are therefore too high.” See ITU. 1995. *Accounting rate principles for international telephone services*. Recommendation D.140. ITU: Geneva.
- ⁴ See M.A. Romagnoli Trotti. “Charging and accounting in the international telephone service: A developing country’s point of view.” In *TELECOMMUNICATION JOURNAL*. Volume 60 - XI / 1993. ITU: Geneva.
- ⁵ See ITU. 1990. *Follow-up Study of the Costs of Providing and Operating International Telephone Service between Industrialized and Developing Countries*. ITU: Geneva.