

DIRECTION OF TRAFFIC, 1999

Trading Telecom Minutes

Executive summary



October 1999

INTERNATIONAL TELECOMMUNICATION UNION

1. Traffic Trends: *Trading telecom minutes*

This report subtitled *Trading telecom minutes*, looks at the wholesale market for international telecommunications traffic. Specifically, it is concerned with the transition from the traditional revenue-sharing mechanisms of the accounting rate system to newer, cost-oriented mechanisms, principally via domestic interconnect regimes or via the Internet.

In 1998, the volume of international telephone traffic was just over 90 billion minutes worldwide. On the basis of current trends, and taking into account the accelerated growth in the number of main lines and the continuing rapid expansion of mobile networks, one can reasonably expect that the number of minutes of international traffic will surpass 100 billion during 1999.

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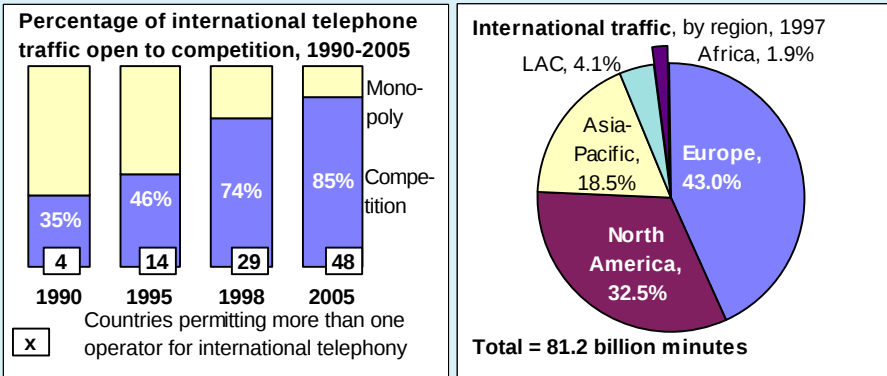
At present almost three-quarters of international outgoing traffic is generated in just 23 developed countries. For incoming traffic, however, the story is somewhat different. The same developed countries account for only 57 per cent of international incoming traffic. This gap between the distribution of outgoing and incoming traffic explains the requirement for an international settlements system and is the main underlying theme of this report.

In 1998, the concept of international telecommunications as a competitively traded service finally became a reality:

- Around three-quarters of the world's international telecommunications traffic is now provided under competitive conditions, compared with just 35 per cent of traffic in 1990 (Figure 1).
- The World Trade Organisation's agreement on basic telecommunications, concluded in 1997, was implemented on 5 February 1998. This has ushered in a multilateral trading regime for international telecommunications traffic. Under the agreement, more than 70 countries, representing over 90 per cent of the total telecommunication market by value, have made commitments for the progressive liberalization of their telecommunication sectors.
- A growing share of international traffic, perhaps as high as 30 per cent, now passes outside the traditional accounting rate system with domestic interconnection becoming the dominant mode of operation, notably in Europe. Indeed, there is a thriving market for trading in options to carry traffic on liberalised routes.

Figure 1: The changing international telecommunications traffic market

Percentage of the international telecommunications market open to competition, 1990-2005, and regional shares of international traffic market, 1997



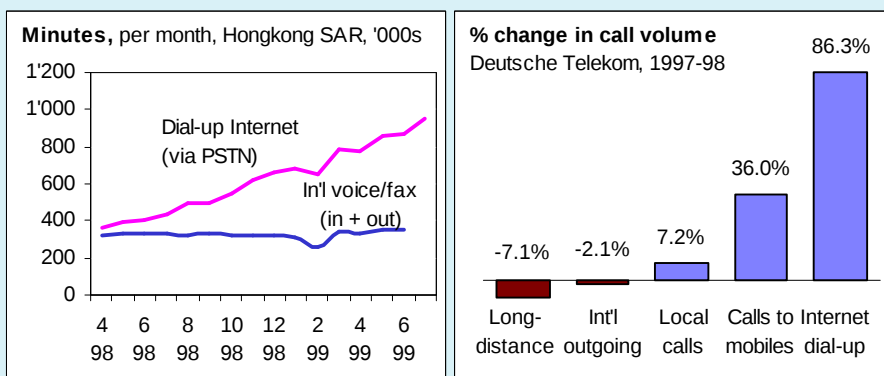
Note: In the left chart, the figures relate only to the commitments made by WTO Member Countries. This is almost certainly an underestimate of the true level of global competition. In the right chart, LAC = Latin America and the Caribbean.

Source: ITU "Telecommunication Regulatory Database", ITU/TeleGeography Inc. "Direction of Traffic" Database and WTO.

In the emerging telecommunications environment, international telephone calls are increasingly treated like domestic ones. This reflects new trade principles and network economics. The economic and technological forces underlying the changing status of international calls are best demonstrated by the Internet. The price paid for an Internet session is the same whether information traverses international borders or not. The longer that international telephone calls continue to deviate in price from domestic telephone calls, the more that international voice and fax traffic will shift to the Internet. As a result, prices for local calls are likely to become the base price for more and more international communications.

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In economies such as Hongkong SAR and Germany, these trends are already in evidence (Figure 2). In the former, the monthly volume of dial-up Internet use is now three times higher than the total for international traffic (outgoing and incoming combined). In the latter, Deutsche Telekom's calls to its Internet service almost doubled in 1998 whereas its international traffic volume fell.

Figure 2: Internet traffic outgrowing other traffic types*Examples from Hongkong SAR, April 1998-July 1999, and Germany, Deutsche Telekom, 1997-98*

Note: For left chart, the minutes of Internet use cover only dial-up access via the Public Switched Telephone Network (PSTN), which is primarily residential use, and exclude access via leased lines, which is primarily business use. For the right chart, the statistics relate only to Deutsche Telekom's network and exclude calls made on other networks in Germany, including those from mobilephones.

Source: ITU, adapted from OFTA, statistics available at <http://www.ofta.gov.hk>, and Deutsche Telekom, 1998 SEC Form 20-F.

2. The International Telecommunications Environment in Transition

What is now emerging is a multilateral regime, based on trade principles and captured in the WTO trade in services regime

The international telecommunications environment has historically been based on a framework of bilateral relations: between countries and latterly between operators. This regime is enshrined in the International Telecommunication Regulations, an international treaty which dates back to the early days of telegraph communications between sovereign states. What is now emerging is a multilateral regime, based on trade principles and captured in the WTO trade in services regime. As a result of this paradigm shift, traditional arrangements for carrying international calls and settling accounts are coming under increasing pressure.

On certain routes, particularly between developed and developing countries, imbalances between incoming and outgoing traffic have been accelerating since the early 1990s. This is partly due to the uneven pace of market reform, but it also represents the increasing ease with which the direction of a particular call can be reversed to arbitrage

price differences, a service known as call-back. The United States is the home of most call-back services and US residents are the most avid users of calling card and home country direct services. Virtually every single country of the world receives more traffic from the United States than it sends. In 1997, the United States sent out some 13.4 billion more minutes of traffic than it received and its trade deficit on international telecommunication services reached some US\$ 5.7 billion.

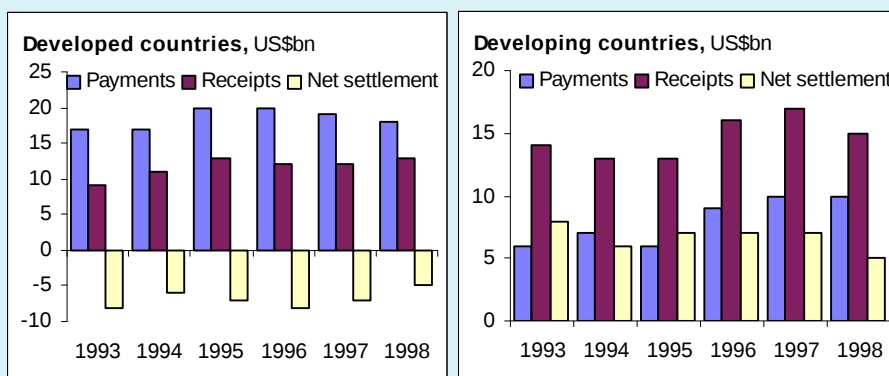
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But the United States is not alone in making net settlement payments to other countries. In total, some 38 countries, as diverse as the Switzerland and Swaziland, are obliged to make net compensation payments to their traffic partners. Added together, they have a net deficit of around US\$ 12 billion in 1997 of which the United States makes up just under half. By contrast, the top ten net settlement surplus countries are all developing economies, headed by China and India, the world's most populous countries (Table 1).

Between 1993 and 1998, a minimum of US\$ 40 billion has been directed towards developing countries via the mechanism of the accounting rate system (Figure 3). If this money had been used in its

Figure 3: Net financial transfers between developed and developing countries

Total payments, receipts and net settlements made under the international accounting rates and settlements system, between developed and developing countries, 1993-97



Notes: For the purpose of the analysis here, the developed countries are broadly defined as the 15 EU Member States plus Iceland, Norway, Switzerland, Canada, United States, Australia, Japan and New Zealand.

Source: ITU estimates.

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Table 1: Top 10 net settlement surplus countries, 1997

As measured by estimated net settlements from the rest of the world, in US\$ million, 1997

<i>Countries</i>	<i>Outgoing traffic 1997 (million minutes)</i>	<i>Incoming traffic 1997(million minutes)</i>	<i>Imbalance (outgoing minus incoming)</i>	<i>Imbalance % of total traffic</i>	<i>US settlement rate, 1997 (US cents per min.)</i>	<i>Estimated net settlement, 1997, (US\$m)</i>
China	1'631.8	2'400.0	-768.2	-19.1%	84.5	650
India	420.5	1'256.0	-835.5	-49.8%	71.0	600
Mexico	1'213.6	2'819.3	-1'605.7	-39.8%	35.0	600
Pakistan	76.9	565.3	-488.4	-76.1%	100.0	500
Viet Nam	55.8	310.0	-254.2	-69.5%	100.0	260
Philippines	249.5	709.0	-459.5	-47.9%	50.0	230
Lebanon	60.0	240.0	-180.0	-60.0%	87.5	160
Colombia	158.2	439.0	-280.8	-47.0%	50.0	140
Jamaica	51.6	269.3	-217.7	-67.8%	62.5	140
Brazil	476.9	776.7	-299.8	-23.9%	42.5	130
Top 10, total/average	4'394.7	9'784.6	-5'389.9	-38.0%	62.0	3'410
All net surplus countries, Total/average	32'234.4	44'248.9	-12'014.5	-15.7%	36.2	6'200

Notes: Figures shown in italics are estimates. All other figures are as reported by the countries concerned. For Jamaica, which does not report bilateral traffic flows, derived statistics for incoming and outgoing traffic for the United States and the United Kingdom, its two major traffic routes, are used.

Source: ITU/TeleGeography Inc. "Direction of Traffic Database", FCC.

entirety to fund network development at best practice procurement rates then it would have been sufficient to fund around 45 million new main lines which would be equivalent to a rise of one extra telephone main line per 100 inhabitants among developing countries. No other net flow of telecommunications assistance towards developing countries, comes near to matching this level of funding.

Understandably, developing countries have been reluctant to move towards lower rates for fear of losing these net settlements. However, pressure exerted on them, particularly by US operators, has been intense.

3. Transitional Arrangements Towards Cost-orientation

It has long been accepted that the logic of the competitive marketplace will dictate a shift from the traditional regime of revenue-sharing for the settlement for international telecommunication services to one based on cost-orientation. Accounting rates have been declining worldwide, especially since ITU-T Recommendation D.140 was approved in 1992 (Figure 4). But it is widely felt that, until recently, these reductions have not been moving fast enough to catch up with declining cost trends. Consequently, most rates remain significantly above costs. Recent events, especially the WTO Agreement on Basic Telecommunications and the FCC Benchmark Order, have brought the issue to a head.

The reform of the accounting rate regime constitutes one the main challenges that the membership of the ITU is facing today, especially for developing countries. In March 1998, ITU held a World Telecommunication Policy Forum on the topic of trade in services. As a result of this meeting, a Focus Group was created with a mandate to develop proposals for “transitional arrangements towards cost orientation beyond 1998, including ranges of indicative target rates”. The Focus Group completed its work in November 1998 and its proposals were accepted, with minor modifications, by ITU-T Study Group 3 at its June 1999 meeting. They should be formally adopted as part of ITU-T Recommendations D.140 before the end of 1999.

The “indicative target rates” proposed by the Focus Group are different from the Benchmarks put forward by the FCC (see Table, 2 and 3).

- For the majority of traffic, generated by developed countries, the target rates proposed by the Focus Group are *lower* than the FCC Benchmarks: for countries with a teledensity above 50, a target rate of 6 US cents per minute is proposed compared with the 15 US cents per minute benchmark for high income economies proposed by the FCC.
- For the majority of countries, especially in the developing world, the target rates proposed by the Focus Group are *higher* than the FCC Benchmarks: for countries with a teledensity of below 1, a target rate of 44 US cents per minute is proposed compared with the 23 US cents per minute benchmark proposed by the FCC.

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Table 2: ITU Focus Group Indicative Target Rates and FCC Benchmarks compared

	<i>FCC Benchmarks</i>	<i>ITU Focus Group</i>
Coverage of analysis	72 economies	224 economies
Data timeliness	1994 for income data; 1995/6 for cost/price data.	1 Jan. 1998 for teledensity; 28 Sept. 1998 for settlement rate data. Teledensity data to be updated annually. Net settlement data on three-year moving average.
Range of Rates (direct relations)	0.11-0.16 SDR per minute (15-23 US cents)	0.043-0.327 SDR per minute (6-44 US cents)
Transit shares	Not covered	0.05 SDR per minute (6.7 US cents)
Country groupings	4 by income + 1 by teledensity	7 by teledensity + 2 others for small island states and LDCs
Target years	Multi-year: 1998 (high income), 99 (upper middle), 2000 (lower middle), 2001 (low income), 2002 (low income, teledensity <1)	Year-end 2001 (2001-2004 for LDCs)
Dependency on settlements	Not Covered	Extended transition period for LDCs

Source: ITU.

The Recommendations of the Focus Group also differ from the approach taken by the FCC in terms of the proposed transition period (to year-end 2001) and in the upper limits proposed for carriage of transit traffic (6.7 US cents per minute). When approved, the Focus Group's recommendations will mark the first multilateral accord on the transition to cost-orientation and will provide a counter-balance to the unilateral approach adopted in the FCC's Benchmarks.

Table 3: Indicative Target Rates proposed by ITU Focus Group

By teledensity group. Teledensity = telephone main lines per 100 inhabitants

Teledensity $T < 1$	$1 < T \leq 5$	$5 < T \leq 10$	$10 < T \leq 20$	$20 < T \leq 35$	$35 < T \leq 50$	$T > 50$
0.327 SDR (44.3 US cents)	0.251 SDR (34.0 US cents)	0.210 SDR (28.5 US cents)	0.162 SDR (22.0 US cents)	0.118 SDR (16.0 US cents)	0.088 SDR (11.9 US cents)	0.043 SDR (5.8 US cents)

Source: ITU Focus Group Recommendation D.140 Annex E.

4. Cost and Price Trends

If the cost of making an international telephone call was directly related to the costs of international infrastructure, then it would be declining by some 40 per cent per year. Thanks to technological change, the infrastructure costs of providing international telephony are tending towards zero. But of course there are many other components involved in the cost of a call. In particular, the national extension part of an international telephone call has not experienced the same dramatic price reductions. Furthermore, as the physical costs of conveying the call have become less significant, the costs associated with marketing, billing and maintenance have become relatively more significant. The result is that there has been a divergence between the cost trends underlying wholesale and retail prices. Overall, the rate of reduction for wholesale costs has been accelerating (see Figure 4).

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At the heart of the debate between developed and developing countries over settlement rates is the issue of whether the cost of terminating a telephone call varies according to the level of development of a country, and if so, by how much? The approach taken by the FCC, in its Benchmarks Order, is that the range of variation in costs is likely to be small. After all, it is argued, the basic elements necessary to construct a network (switches, cables, transmission devices etc.,) can be bought on the global market at competitive prices. Consequently, the FCC proposes a relatively narrow range of costs, between 15 and 23 US cents per minute, or a ratio of 1 to 1.5.

By contrast, the approach taken by the ITU Focus Group was based on a “best practice” approach using actual market prices for settlement rates in all the economies of the world, not just the ones with large traffic streams to the United States. The economies were divided into seven teledensity groups and the average of the lowest 20 per cent of published settlement rates in each group was established as the target for the group. Two additional groups were defined, covering small island states and the Least Developed Countries (LDCs). The resulting analysis gives a range of costs between 6 and 44 US cents per minute, or a ratio of 1 to 6. The rationale here is that the volume of traffic generated by a country is a critical factor in determining its unit cost.

The real cost difference between developed and developing countries probably lies somewhere between that suggested by the FCC and the Focus Group. Furthermore, the cost distribution, if it could be plotted, would probably be a highly skewed one with the highest costs

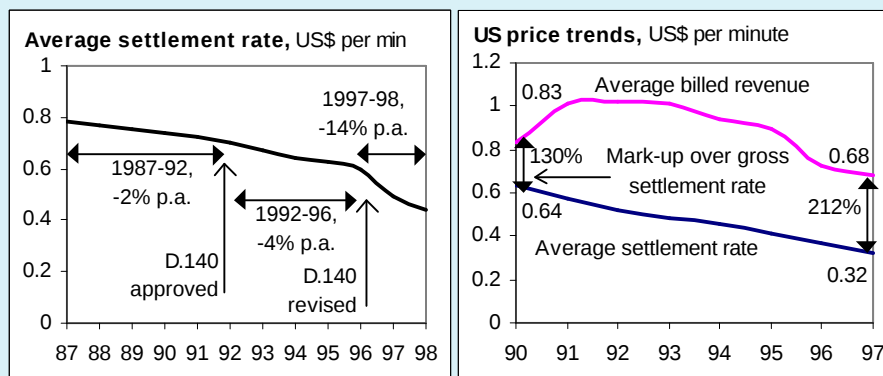
occurring in the LDCs and in other small states, especially remote islands. Cost differences are unlikely to be so high between, say, a large developing economy with a high volume of traffic and a small developed country with limited traffic.

But the real costs of providing international telecommunication services will probably never be known. And even if they were known, the cost structure would probably have changed by the time the study had been completed. It is possible to use cost models to achieve almost any desired result. For consumers, it is the price not the estimated cost which is the issue. For regulators, it is the negotiated interconnect price rather than the true underlying cost which is significant. For PTO managers and shareholders, it is the overall package of costs, rather than their allocation to individual services, which needs to be managed. Ultimately, models for allocating cost are mainly of academic interest.

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Figure 4: Sliding downwards

Price trends for global average settlement rates, 1987-98, and for US retail rates and settlement rates, 1990-1997, in US\$ per minute



Note: In the left chart, the "global average settlement rate" is based on responses to an annual questionnaire carried out by the ITU. In the right chart, the retail price is calculated by dividing the revenue per minute billed by US carriers by the total number of outgoing international traffic minutes. The "settlement rate" is an average US settlement rate for all routes weighted by traffic.

Source: ITU, FCC.

5. Developing Country Concerns

Debate about the reform of the international accounting rates system has stirred immense concern among developing countries. While developing countries have been part of the gathering momentum towards the implementation of cost-oriented accounting rates, and many have made commitments to market opening under the WTO basic telecommunications agreement, they continue to be concerned about the impact these changes will have on their telecommunication economies.

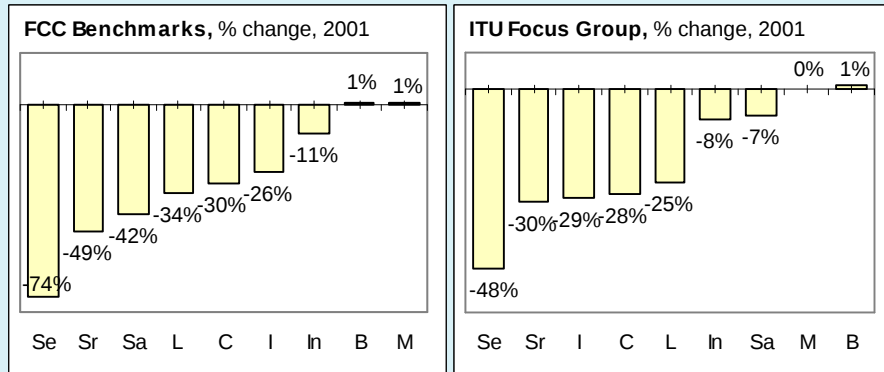
Most nations of the developing world are net receivers of international telephone traffic and hence recipients of settlement payments. Any change to the status quo could involve a reduction in these payments. In order to investigate the likely impact that changes in the international telecommunications environment could have on developing countries, a series of country case studies were commissioned by the ITU, the Commonwealth Telecommunication Organisation, the World Bank's *InfoDev* Programme and the European Union. The case studies looked at the impact of five main scenarios for accounting rate reform:

1. Implementation of the FCC benchmarks;
2. Staged reductions of 6 or 10 per cent per year;
3. Asymmetric settlement, for instance using a termination charge or a 60/40 split of the accounting rate;
4. Very-low settlements rates or sender-keeps-all;
5. Implementation of the Focus Group's indicative target rates.

For the majority of countries, the worst scenario is the collapse of the accounting rate system (4), or implementation of FCC Benchmarks (1). Staged reductions (2) and the Focus Group's recommendations (5) are relatively neutral in their revenue impact, presuming that traffic continues to grow at current levels. Asymmetric settlement (3) would bring positive benefits to some countries, though not to all. Figure 5 summarises the impact of the FCC Benchmark and Focus Group scenarios relative to a hypothetical "Baseline" scenario in which accounting rates remain unchanged at 1997 levels. Senegal and Sri Lanka are likely to be the most affected in both scenarios. That is because these countries have relatively high settlement rates and are dependant on net settlement payments for more than 30 per cent of their total telecommunications revenue. At the other end of the scale Mauritania and the Bahamas are relatively unaffected by the changes.

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Figure 5: Impact of reform on the international revenues of carriers in nine case study countries
 Percentage deviation in international revenues by 2001 from baseline scenario of implementation of FCC Benchmarks or Focus Group Indicative Target Rates



Key: B = Bahamas; C = Colombia; I = India; In = Indonesia; L = Lebanon; M = Mauritania, Sa = Samoa, Se = Senegal; Sr = Sri Lanka.

Note: Zero percentage change represents no change in international revenues from the baseline scenario in 2001 under which settlement rates remain the same as 1997 levels.

Source: ITU calculations, based on ITU/CTO/EU country case studies.

6. Transit Charges

For many countries, transit traffic represents a major portion of their total traffic

The service of *transit* involves the delivery of telecommunications traffic from one country to another via a third country. Transit is unavoidable for some developing countries because of their geographical situation. Larger, operators are increasingly offering transit as a competitive service, a practice often called *hubbing*. Some operators also offer to terminate and reoriginate a particular call—a service known as *refile*—in order to exploit arbitrage opportunities in the price of two indirect calls compared with one direct one.

For many countries, transit traffic represents a major portion of their total traffic. For instance, Lesotho's transit payments are so high that the country maintains a settlement payment deficit with the rest of the world. No carrier voluntarily publishes transit charges and only one regulator, OFTEL in the United Kingdom, requires publication, and even this obligation is restricted to a few markets where one or more companies hold a dominant position. A transit carrier will typically agree one rate for a traffic stream with both origin and destination countries (the published rate) but actually charge a different, lower rate (the confidential rate) to the origin country. The lack of transparency means that competition is frequently not effective

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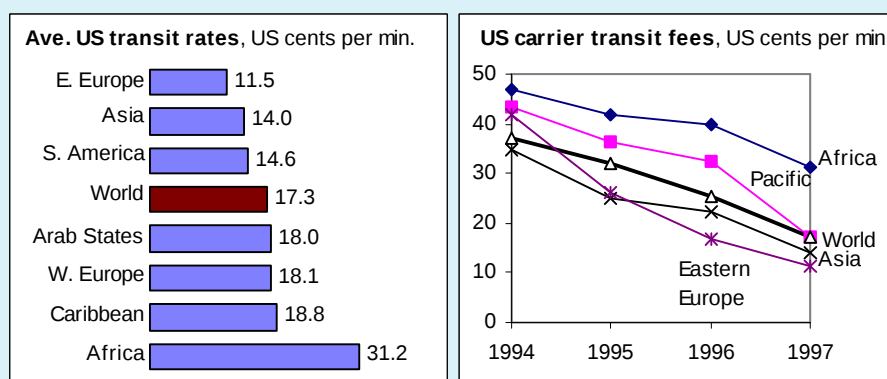
in reducing prices. Using data on transit revenues raised by US companies, it is possible to estimate that the average price for transit was some 17 US cents per minute in 1997 and above 30 US cents in Africa. These rates are actually *higher* than the FCC's Benchmarks for settlement rates in many parts of the world.

In discussions over transit, the positions adopted by operators of the developed North and the developing South are often the reverse of the positions adopted over settlement rates. For instance, countries of the North which are net exporters of telephone traffic have adopted a position of wanting to see settlement rates reduced towards costs, in a transparent, non-discriminatory and cost-oriented environment. In the case of transit relations, it is the countries of the South which are pushing for lower rates, and the operators of the North which are resisting the call.

The Focus Group has proposed an upper limit on transit charges of 6.7 US cents per minute to be achieved by year end 2000 in relations where the operator lacks a choice of transit service provider. If implemented, this would bring substantial benefits to small and land-locked economies. The FCC's Benchmark Order is curiously silent on the topic of transit, perhaps reflecting the fact that US carriers are among the major providers of the service.

The Focus Group has proposed an upper limit on transit charges of 6.7 US cents per minute to be achieved by year end 2000

Figure 6: Transit charge costs per minute, for US carriers, by region 1997, and trends 1994-97
Figures are shown in US cents per minute.



Note: Unit costs per minute are calculated by dividing the revenue paid by foreign carriers, minus the revenue paid out to foreign carriers, by the minutes of traffic originating from each region.

Source: Adapted from FCC "Statistics of Common Carriers Yearbook", various years.

7. Profits and Losses

When the first *Direction of Traffic* report was published, five years ago, international telecommunications was a high margin, high growth market. But the business of carrying international telephone traffic is no longer such a profitable one to be in. New market entry and price competition are turning the provision of minutes of international traffic into a cut-throat commodity business. The Internet threatens to undermine the entire business model on which the international traffic industry is founded. As Table 4 shows, while the top 20 public telecommunication operators (ranked in terms of international traffic) saw their traffic streams grow by 7 per cent during 1998, the revenue they derived from the service actually fell by some 8 per cent. This reflects the impact of tariff cuts which many operators made before and during 1998 in order to combat the threat of competition. Also international traffic is increasingly being routed outside the accounting rate system in ways which are not as easy to measure, for instance, via the Internet. The prospects of slower growth have encouraged the major carriers to seek alliances to achieve economies of scale and further scope for cost-cutting, notably the AT&T/BT alliance and the MCI/WorldCom merger.

Whichever scenario comes to pass for the evolution of the international trading system for minutes of international telecommunications traffic, it is likely that the current volume of cross-border financial transactions, particularly from developed to developing countries, will diminish in size and significance. In the days of relative plenty, it was possible for carriers to overlook the inequities and inefficiencies of the accounting rate system. Now that profit margins are being squeezed, above-cost accounting rates seem an obvious target for cost-cutting. The main losers from settlement payment reductions are likely to be operators in developing countries. They face a dilemma. If they cut settlement rates too quickly, they may lose vital revenue. On the other hand, if they cut settlement rates too slowly, they risk seeing the whole accounting rate system collapse with voice traffic shifting to the Internet. The majority of developing countries are now negotiating lower settlement rates, but they argue that more time is needed before they can reach cost-oriented levels. The critical word is *transition*.

The bottom line is that change is inevitable, but for developing country carriers that change should be approached positively. There are risks on both sides, but the status quo is not an option. With the recommendations of the ITU Focus Group, a consensus transition path has now been mapped out. But will it be followed?

The Internet threatens to undermine the entire business model on which the international traffic industry is founded

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Table 4: Top 20 Public Telecommunication Operators
Ranked by bothway international traffic (incoming plus outgoing), 1998

Operator (Country)	Int'l telephone traffic (bothway)		International telephone revenue		
	Minutes, m	CAGR	US\$ m		CAGR
	1998	(97-98)	1998		(97-98)
AT&T (USA)	14'529	7.1%	9'555	G	-2.7%
Deutsche Telekom (Germ.)	10'058	3.0%	3'357	G	-16.4%
MCI WorldCom (USA) ^b	7'189	16.5%	4'743	R	21.2%
France Télécom	7'300	9.0%	1'859	G	-17.3%
BT (UK) ^a	6'350	10.2%	924	G	-14.2%
Telecom Italia	5'289	9.5%	1'438	N	0.6%
Sprint (USA)	4'470	10.1%	1'820	G	1.1%
China Telecom (China)	4'212	4.9%	2'200	G	3.0%
Hongkong Telecom ^a	3'818	3.8%	1'995	G	-17.7%
Telefónica (Spain)	3'704	16.1%	813	N	-3.9%
Swisscom (Switz.)	3'680	-2.9%	1'379	G	2.2%
Telmex (Mexico)	3'286	-12.8%	879	N	-24.3%
KPN (Netherlands)	3'443	6.0%	847	G	-23.6%
C&W Comm. (UK) ^a	2'670	36.2%	477	G	36.0%
Belgacom (Belgium)	2'622	10.0%	548	N	-6.5%
Singapore Telecom ^a	2'251	25.6%	1'267	G	7.3%
KDD (Japan) ^a	2'200	3.3%	1'903	G	-5.0%
PTA (Austria)	1'954	4.9%	492	R	-9.3%
Teleglobe (Canada)	1'905	3.1%	631	G	-18.3%
VSNL (India) ^a	1'679	21.2%	1'600	G	11.8%
TOP 20	92'609	7.0%	38'727		-8.4%

Note: United States dollar values are obtained by using operator supplied exchange rates or ending period exchange rate. International revenue is shown as reported by the operator: G = Gross (including settlement receipts or payments); R = Retail (not including settlement receipts of payments); N = Net (after adjusting for settlement transactions). Figures in italics are estimates or refer to years other than those specified (e.g., 1997 and 1996-97 CAGR). CAGR = Compound Annual Growth Rate.

^a Year beginning 1 April. ^b MCI and WorldCom merged in 1998. A merger with Sprint was announced in October 1999.

Source: ITU.

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