

INTERNATIONAL TELECOMMUNICATION UNION

**CASE STUDY OF THE CHANGING INTERNATIONAL
TELECOMMUNICATIONS ENVIRONMENT**

COLOMBIA

DRAFT REPORT

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AUTHOR'S NOTE

This is the Final Report of the ITU Case Study on the impact of changing international settlements policies on the telecommunications sector in Colombia. David N. Townsend & Associates, a telecommunications policy and economics consulting firm, based in the United States, have conducted this study. The study authors are David N. Townsend and Daniel Espitia G.

Objectives and Methodology

The purpose of the study as originally stated reads: "to consider some of the developing countries likely to be the most vulnerable to changes in the international accounting rate system, to examine likely scenarios and to evaluate possible responses, both at the policy-making and commercial levels." To address these goals, we have conducted an in-depth analysis of the conditions of the Colombian telecommunications industry, especially in international services. Using the information gained, we have constructed a series of economic models of industry costs, traffic, and revenues, which simulate the impact of changes to a wide range of variables, most importantly present and future settlement rates.

Acknowledgement

We would like to acknowledge and thank the Comisión de Regulación de Telecomunicaciones de Colombia (CRT) and Commissioner Diego Molano V., who has worked closely with us, and assisted us with excellent on-site logistical support.. The findings and analysis of this study are based upon the information provided by the CRT, Telecom, and other sources, but the study conclusions are those of DNTA only.

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1 COLOMBIA OVERVIEW

The following is a summary of the general economic and social situation in Colombia.

1.1 Macro-economic

The general macro-economic situation of Colombia had looked somewhat somber until recently as compared to the beginning of the present administration. Colombia had traditionally maintained among the most sound macro-economic policy management in Latin America, coupled with a very robust private sector capacity. Today, however, Colombia is undergoing an economic crisis, that although not yet acute, could potentially deteriorate further. The sectors most severely affected are agriculture and construction.

Several factors have contributed to the present economic crisis, some of which are more of a political nature, yet with strong economic repercussions, such as the so-called “de-certification” of Colombia as a “most-favoured nation” for trading with the United States. (In fact, this decertification was partially removed as of late February 1998.)

Colombia is the ninth wealthiest economy in Latin America and second within the Andean Group countries, with a per capita GDP of US\$ 2,205. Colombia’s average growth over the past six years has been 4.2% annually with growth rate projected to continue at this pace for 1997. Total GDP stood at approximately US\$82-billion in 1996. The inflation level has been steadily decreasing over the past seven years from 32.4% in 1990 to 21.6% at the end of 1996. The national unemployment rate has increased from 9.5% in 1995 to 11.3% in 1996; however, the Gini coefficient that measures income level equality has only increased slightly over the last six years, with a level of 4.5 for 1996.

The telecommunications sector contribution to GDP has increased from 1.81% in 1990 to 2.13% in 1996. The telecommunications and transport sectors combined employ a total of 335,000 people. Revenues from international telecommunications settlements contributed a net total of US\$162-million to the Colombian economy in 1996, or about 0.2% of GDP.

The process of Colombian *apertura* or “opening of the economy” that was begun by the previous administration, has been slowed during the current administration to place more emphasis on a social-welfare oriented strategic development plan. Ironically, however, it has been during this administration that the seeds of reform in the telecommunications sector –that had been planted much earlier -- are finally maturing, perhaps most dramatically in the recent issuing of the license for competition in international long distance services to the first competitor in Colombia’s history.

1.2 Social

The social situation in Colombia has improved on some fronts and worsened on others, with a general balance perhaps toward the latter. The main social problem in Colombia today is the pervasive violence and the presence of paramilitary armed groups that have for decades undermined both democracy and the country’s economic growth. Attempts to deal with these groups, both militarily and through amnesty provisions, have largely failed thus far.

Therefore, one of the social issues that receives much attention and support today and for which there seems to be an increasing constituency is that of achieving peace. Peace in Colombia has become a necessity, especially today when the climate of general economic stability that Colombians have enjoyed in the past seems to be eroding. The current economic crisis, coupled with the unsolved social troubles, contribute to a general climate of uncertainty. Peace is one of the issues at the core in the upcoming presidential elections.

1.3. Geographic and demographic

Colombia is the most northern country in South America, with a population of 35 million people in a country of 1.147.140 km², that is, three times the size of France or twice the size of the unified Germany. However, the general demographic distribution contrasts sharply, with nearly 95% of the population living in 43% of Colombia’s territory, in the mountainous western and north-western regions.

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2. TELECOMMUNICATION POLICY AND NETWORK DEVELOPMENT

2.1. Industry structure

The structure of the telecommunications industry, particularly that of local telephony is unique to Colombia. The basic structure consists of 37 independent local telephone companies and a dominant operator, Telecom, for the provision of national and international long distance services, and also with the responsibility to cover universal service obligations in under-served areas and localities. This was the predominant industry structure for most of the period before the sector-restructuring programme began.

Telecommunications policy began to evolve in Colombia in 1990 with the passage of the first legislation geared toward the possibility of competition in the sector. Yet it was not until 1994 that the landscape of the sector began to be re-shaped by new entrants and services. The most significant of these was the introduction of cellular telephony.

Earlier legislation also permitted competition in local telephony, but it was not until 1995 that new operators began to make substantial investments in local telephony. In 1996, the first local competition was introduced, when local operator CAPITEL began construction of local lines in Bogotá, with plans to complete a half million lines. Other minor but significant investments in local telephony are planned: the telephone company of Medellín, the second largest city in Colombia, will install 100,000 lines in Bogotá next year, and Telecom will install 50,000 lines in both Medellín and the city of Bucaramanga.

Since September 1997, the CRT has established the requirements for potential new operators in the provision of national and international long distance services. Entry requirements for competition include the payment of license fees, an association with a foreign strategic partner, and a commitment to implement specific coverage goals. On January 21, 1998, the CRT licensed the first competitive long distance carrier under these rules, Orbitel.

2.2 Regulatory and policy making structure

Evolution of the regulatory structure in Colombia

The Colombian telecommunications sector has undergone significant institutional change over the past five years, although this change has been at times reluctant to come. Before this transition, the main operational decisions resided within the Ministry of Communications and Telecom, whereas tariff regulation and overall policy planning was the responsibility of the Planning Department.

As a result of a World Bank funded restructuring programme, the telecommunications sector has separated into distinct areas of operations, policy-making and regulation, respectively under Telecom, the Ministry of Communications, and the CRT. Although the CRT was created in 1992 as an independent body, it was not until two years later that it began to establish itself independently from the Ministry.

Colombia's position before the WTO

Today in Colombia practically all telecommunications markets are open for competition. This policy is reflected in Colombia's commitments to the WTO. Following are the specific limitations to access to the telecommunications markets as stated in Colombia's offer to the WTO:

- For all different telecommunications markets: a license is required, as long as the operators are legal Colombian entities. Foreign investment up to 70% is allowed.
- Local and extended local telephony: Open for competition as long as coverage in major cities is equivalent to present coverage. Otherwise local coverage is allowed in areas where there is no present local coverage in cities.
- Long distance, national and international: Routing of traffic has to be done through licensed operators. Call-back type services are illegal. Foreign investment up to 70% is allowed.
- Data transmission: Foreign investment up to 70% is allowed.

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- Mobile and cellular services: 800 MHz band. For cellular service the country is divided in three regions, each with two competing operators with exclusivity until 1 September 1999. Foreign investment up to 70% is allowed.
- PCS: Entry allowed beginning 31 December 1999.
- Paging and Trunking: Entry allowed beginning 30 June 1997.

2.3 Telecommunications network of the country

Status of fixed and mobile

The basic telephone service network (RTPBC) in the country is in the process of a technological actualization that has been taking place since the 1980s, mainly aimed at achieving a greater level of digitalization for the switching and transmission elements of the network. According to the Ministry of Planning (Departamento Nacional de Planeación –DNP) in 1995 nearly 70% of installed lines were digital, and it is expected that digitalisation by the year 2000 will be nearly 83%, and by 2005, all local switches should be fully digital.

Status of network development

The national long distance switches are 84% digital at present, yet limited in scope because of connection to local analogue switches., International long distance switches are fully digital.

For other services, Colombia forecasts the number of cellular/PCS users at 3 million in the year 2007, and during the same period the average growth in cellular service is expected to be approximately 15% annual growth, however, growth could be much higher. In spite of the fact that cellular service usage charges are quite high right now (US\$0.50 per minute), they are not expected to move down substantially until after the year 2000.

In the next few years, cellular and trunking service development will continue and PCS will be introduced, which will create new regulatory challenges.

Financing plans for network investment

Colombia has an investment plan for expansion over the next 10 years of nearly US\$ 10-billion across an entire array of services, of which the major investments are planned for basic telephony (over US\$5-billion), cellular and PCS (US\$1.87-billion), and pay TV (US\$1.26-billion).

About US\$1.5-billion of this investment will come from the “Fondo de Telecomunicaciones” fund, administered by the Ministry of Communications, from revenue generated as a result of rate rebalancing and overall tariff rate increases. It is expected that the rest of the planned investment requirements will be absorbed by the private sector.

List of major public telecommunications operators

Table 3.1 provides a summary of the major public telecommunications operators in Colombia. However, for local telephony there are 37 local telephone companies.

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Table 3.1: Major Public Telecommunication Operators in Colombia

| <i>Major four local telephone operators</i> | <i>Number of lines</i> |
|---|------------------------|
| Empresa de Teléfonos de Bogotá (ETB) | 1,610,520 |
| Telecom | 778,900 |
| Empresa de Teléfonos de Medellín (EPM) | 731,035 |
| Empresas Municipales de Cali (EMCALI) | 415,867 |

| <i>Extended local telephone operators</i> |
|---|
| Telecom |
| Edatec |

| <i>National and International Long Distance Operator</i> |
|--|
| Telecom |

| <i>Mobile and Cellular telephone operators</i> |
|--|
| COMCEL |
| CELUMOVIL |
| COCELCO |
| CELCARIBE |
| OCCEL |

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Review of telecommunications indicators

The following are the most significant telecommunications indicators for Colombia:

| Indicator | Value as of 1996 |
|--------------------------------------|-----------------------------------|
| Telephone density (lines in service) | 13.7 lines per 100 |
| Telephone density (lines installed) | 17 lines per 100 |
| Public telephone density | 1 per 1,000 |
| Mobile cellular and PCS density | 1 per 100 |
| Line waiting time average | 8 months |
| Number of failures per line per year | 1.7 |
| Time to fix a line failure | 40% of lines fixed within 10 days |
| Household coverage | 30% (estimate) |
| Range of rural coverage | From 60% to 72% |
| TV access rate | 90% households |
| TV per-subscription access rate | 20% households |
| Internet access | 25,000 users |

Tariff structure

The tariff structure for Colombia is not as simple as in some other countries. Tariffs for all basic public services have been subdivided, for the purpose of cross-subsidisation according to customer income levels, into six different residential categories called “*estratos*”, plus one non-residential or business category. An “*estrato*” is a specific household location within an urban setting. Depending upon the *estrato* in which a household is located, the system applies different tariffs for the basic monthly telephone charge and local usage.

This price differentiation applies to basic telecommunications services, but only in local service. There is no cross-subsidy between long distance and local service; and it is required by the regulatory authority to clearly separate accounting by services. Subsidy transfers between long distance, other services and local is not permitted. However, subsidy transfers are permitted between different local customer groups or *estratos*.

Tariff rebalancing

The first step in the direction of tariff rebalancing was to separate the accounting for local and long distance services, as a preliminary approach to see the true costs of local telephony provision. Local tariffs have been regulated for the past decade by a price-cap mechanism by using the previous period CPI, although the price level does not yet fully reflect costs.

After 1998, the increase in local tariffs has to reflect costs according the current legislation, using a cost methodology devised by the CRT. This method consists of calculating the average investment cost per line per year using historical data from the previous year’s financial statement, along with the present values for expansion over the next 15 years, discounted with a profit factor of 13%. This 13% is the maximum allowed under current rate-of-return regulation, which overlaps with the price-cap mechanism. Following this, each carrier calculates tariffs by assigning a relative weight, according to limits defined by the CRT.

The CRT has established a price-cap system by which local call tariffs will adjust only according to the previous year CPI minus X-factor productivity (X is currently set at 2.0). It is expected that as new operators enter the long distance market, competition will cause long distance tariffs to decrease by themselves. These rates, however, cannot go below a price floor established by the CRT.

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The following is a summary of the proposed plan for rate rebalancing in telecommunications in Colombia, which is to be fully implemented over a period of four years:

- *Estratos* 1, 2, 3 subsidies will be reduced to no more than 50%, 20%, and 15%, respectively. These transfers will originate mainly from *estratos* 5, 6 plus business or non-residential.
- *Estrato* 4 will be maintained “neutral,” i.e., without receiving or giving any subsidies.
- *Estratos* 5, 6 and non-residential will contribute 20% over costs.

The restructuring of the system of tariff by *estratos* will require diminishing the current amount of subsidy until it reaches the required percentage goals. The obvious result of this is a gradual rate rebalancing of the current tariff structure by the end of 2001. Possibly a further rate rebalancing schedule could be planned and implemented at the time.

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3. EVOLUTION OF INTERNATIONAL TELECOMMUNICATIONS ENVIRONMENT

3.1 Regulatory status

Telecom has been a legal monopoly for the provision of international (and national) telecommunications services until January of this year when the first licensed to a competitor was awarded to the local telephone company of Bogotá (ETB). Further competitive entry is encouraged by the CRT, with the provision that new applicants must provide equivalent coverage as incumbent operators, must pay an up-front license fee, and must contribute 5% of revenues to Universal Service (as must all carriers). Call-back services are prohibited in Colombia, although there is little information available as to the possible extent of illegal call-back services.

3.2 International traffic

Total international traffic more than doubled from 1990 to 1996 to 520-million minutes annually. However, annual growth in international traffic has generally declined from a high of 20% (1993-94) to 9% (1995-96). The United States accounts for 74% of total incoming and 46% of total outgoing traffic, and in the aggregate it provided 67% (in 1996) of the international traffic.

Table 3.1 : International traffic

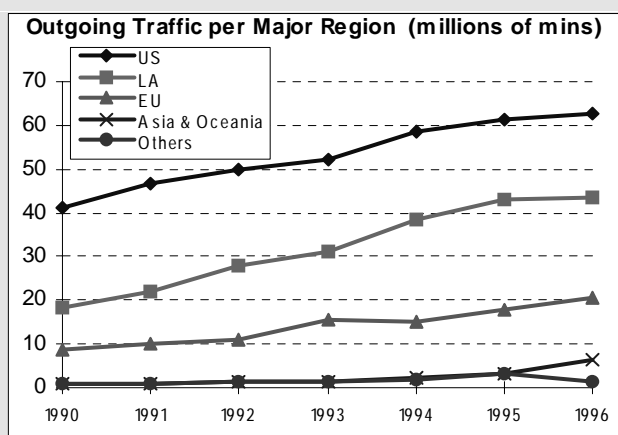
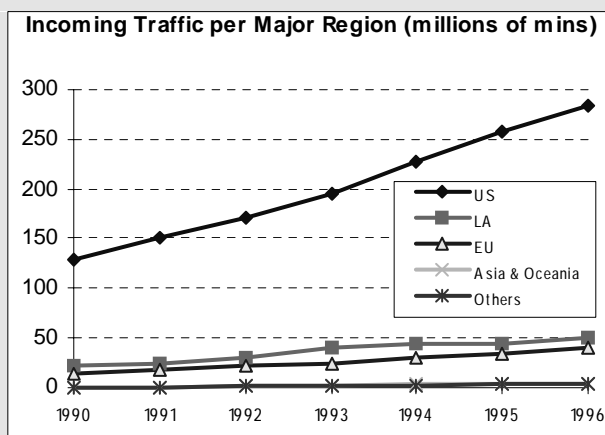
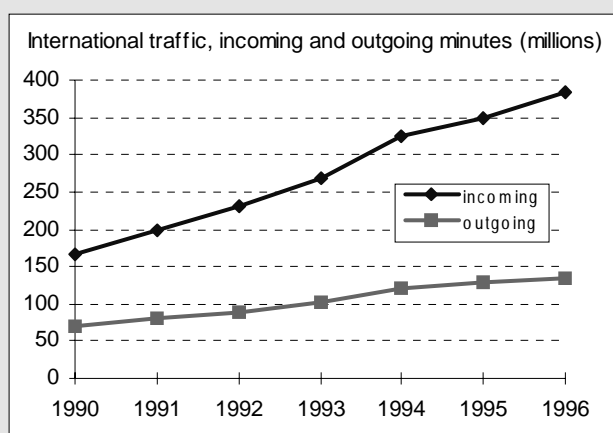
| Year | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 |
|--------------------|-------|--------|--------|--------|--------|-------|-------|
| Incoming min (mil) | 166.3 | 198.7 | 231.5 | 267.9 | 323.6 | 347.7 | 384.2 |
| Outgoing min (mil) | 69.4 | 79.5 | 89.6 | 101.6 | 121.7 | 128.8 | 135.5 |
| Total min (mil) | 235.7 | 278.3 | 321.1 | 369.5 | 445.2 | 476.5 | 519.7 |
| % growth | | 18.05% | 15.41% | 15.05% | 20.50% | 7.02% | 9.06% |
| Access lines (mil) | 2.95 | 3.07 | 3.07 | 3.07 | 3.07 | 3.07 | 3.07 |
| Minutes per line | 79.9 | 90.6 | 104.5 | 120.3 | 145 | 155.1 | 169.2 |
| % growth | | 13.42% | 15.41% | 15.05% | 20.50% | 7.02% | 9.06% |

Source: Case study.

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Figure 3.1: Incoming and outgoing traffic

Total, and by region, in millions of minutes, 1990-96



Source: Case study.

Table 3.2: Outgoing Traffic,

Percentage annual growth

| | 1990-91 | 1991-92 | 1992-93 | 1993-94 | 1994-95 | 1995-96 |
|---------------|---------|---------|---------|---------|---------|---------|
| United States | 10.8% | 8.8% | 5.3% | 10.3% | -27.4% | 49.3% |
| Latin America | 22.0% | 20.0% | 19.0% | 19.6% | -43.9% | 107.7% |
| Europe | 17.3% | 14.3% | 35.6% | -1.3% | | |

Table 3.3: Incoming Traffic

Percentage annual growth

| | 1990-91 | 1991-92 | 1992-93 | 1993-94 | 1994-95 | 1995-96 |
|--|---------|---------|---------|---------|---------|---------|
| | | | | | | |

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| | | | | | | |
|---------------|-------|-------|-------|-------|-------|-------|
| United States | 17.6% | 13.5% | 14.6% | 15.7% | 13.4% | 10.7% |
| Latin America | 25.5% | 25.1% | 27.1% | 9.3% | 1.5% | 11.7% |
| Europe | 24.5% | 27.2% | 8.0% | 13.6% | 19.3% | 10.4% |

Table 3.4: Trends in international telephone traffic

Traffic with top 20 correspondents (million minutes)

| Country | 1990 | | 1991 | | 1992 | | 1993 | | 1994 | | 1995 | | 1996 | |
|------------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|
| | in | out | in | out | in | out | in | out | in | out | in | out | in | out |
| USA | 127.9 | 41.3 | 150.5 | 45.8 | 170.8 | 49.8 | 195.7 | 52.4 | 226.6 | 57.8 | 256.9 | 61.4 | 284.4 | 62.6 |
| Venezuela | 8.6 | 5.1 | 9.4 | 7.0 | 12.6 | 9.3 | 17.1 | 11.1 | 19.2 | 13.4 | 17.8 | 14.2 | 18.5 | 14.2 |
| Spain | 3.8 | 2.0 | 5.2 | 2.5 | 7.5 | 3.0 | 7.6 | 4.2 | 8.4 | 4.1 | 11.4 | 6.6 | 13.8 | 6.0 |
| Italy | 2.1 | 1.2 | 3.1 | 1.3 | 4.2 | 1.5 | 4.7 | 2.7 | 5.0 | 2.2 | 6.4 | 3.6 | 6.5 | 2.8 |
| México | 2.0 | 2.0 | 3.4 | 2.3 | 3.9 | 2.7 | 4.8 | 3.1 | 4.5 | 4.0 | 5.8 | 4.4 | 5.6 | 4.8 |
| Panamá | 2.6 | 2.8 | 3.2 | 3.3 | 3.5 | 3.7 | 4.1 | 4.0 | 4.0 | 4.4 | 4.0 | 4.3 | 4.3 | 4.8 |
| Canadá | 1.9 | 0.9 | 2.4 | 1.0 | 2.8 | 1.1 | 3.5 | 1.3 | 3.3 | 1.6 | 3.7 | 1.9 | 3.8 | 3.8 |
| Ecuador | 1.3 | 2.3 | 2.6 | 2.8 | 3.1 | 3.2 | 4.1 | 4.2 | 4.5 | 5.1 | 2.6 | 5.3 | 4.9 | 6.3 |
| Germany | 2.2 | 1.3 | 2.7 | 1.5 | 3.0 | 1.7 | 3.5 | 1.9 | 4.4 | 2.2 | 5.1 | 2.4 | 5.9 | 2.5 |
| IUK | 2.5 | 1.5 | 2.4 | 1.7 | 2.7 | 1.8 | 3.3 | 2.4 | 3.7 | 2.4 | 4.1 | 3.3 | 4.5 | 4.9 |
| France | 1.8 | 1.2 | 2.1 | 1.3 | 2.2 | 1.5 | 2.3 | 2.0 | 2.6 | 1.9 | 3.1 | 2.5 | 3.3 | 2.3 |
| Japan | 1.6 | 0.5 | 2.2 | 0.6 | 2.5 | 0.5 | 3.1 | 0.6 | 4.4 | 0.6 | 5.2 | 0.6 | 5.0 | 1.2 |
| Brazil | 1.1 | 1.5 | 1.3 | 1.4 | 1.5 | 1.6 | 1.5 | 2.1 | 1.9 | 2.2 | 2.6 | 2.9 | 3.0 | 2.9 |
| Neths. | 0.8 | 0.4 | 1.1 | 0.4 | 1.5 | 0.5 | 1.4 | 0.6 | 1.3 | 0.7 | 1.2 | 0.7 | 0.9 | 0.7 |
| Switz. | 1.1 | 0.5 | 1.2 | 0.6 | 1.5 | 0.7 | 1.7 | 0.7 | 2.0 | 0.8 | 2.2 | 0.8 | 2.7 | 0.9 |
| Costa Rica | 0.6 | 0.7 | 0.7 | 0.8 | 0.8 | 0.9 | 1.1 | 1.1 | 1.2 | 1.2 | 1.4 | 2.5 | 1.7 | 1.6 |
| Perú | 0.8 | 1.1 | 1.0 | 1.4 | 1.2 | 1.6 | 1.5 | 1.7 | 1.9 | 2.0 | 1.7 | 2.2 | 2.5 | 2.8 |
| Argentina | 0.6 | 1.0 | 0.8 | 1.2 | 1.1 | 1.3 | 1.4 | 1.6 | 1.9 | 2.0 | 2.0 | 2.3 | 1.9 | 2.3 |
| Chile | 0.5 | 0.6 | 0.8 | 0.8 | 0.9 | 0.9 | 1.1 | 1.1 | 0.9 | 1.3 | 1.8 | 1.5 | 2.5 | 1.7 |
| Sweden | 0.5 | 0.2 | 0.6 | 0.2 | 0.5 | 0.3 | 0.5 | 0.3 | 1.1 | 0.5 | 0.5 | 0.5 | 0.4 | 0.3 |

Source: CRT and Telecom.

3.3 Settlement rates and tariffs

Trends in settlement rate payments are both downward (see Figure 3.3 with the rates for 1990 and 1997) and they are also converging –that is, there is more uniformity in the rates across geographic regions in particular. The settlement rate for a very few countries is not as uniform but this is rather the exception; some countries' settlement rates are still very high, such as with Belgium (US\$1.57/min),. By contrast, the rate with Bolivia is very low (US\$0.44/min), yet with none of these countries there is a significant traffic interchange with Colombia.

Settlement rate schedules have a degree of geographic consistency. For example for most countries of Latin America with which Colombia has important traffic the settlement rate is typically US\$.65/min. For some European countries there is also this consistency, however, settlement rates can vary from US\$.54/min for Spain to US\$1.08/min for Austria.

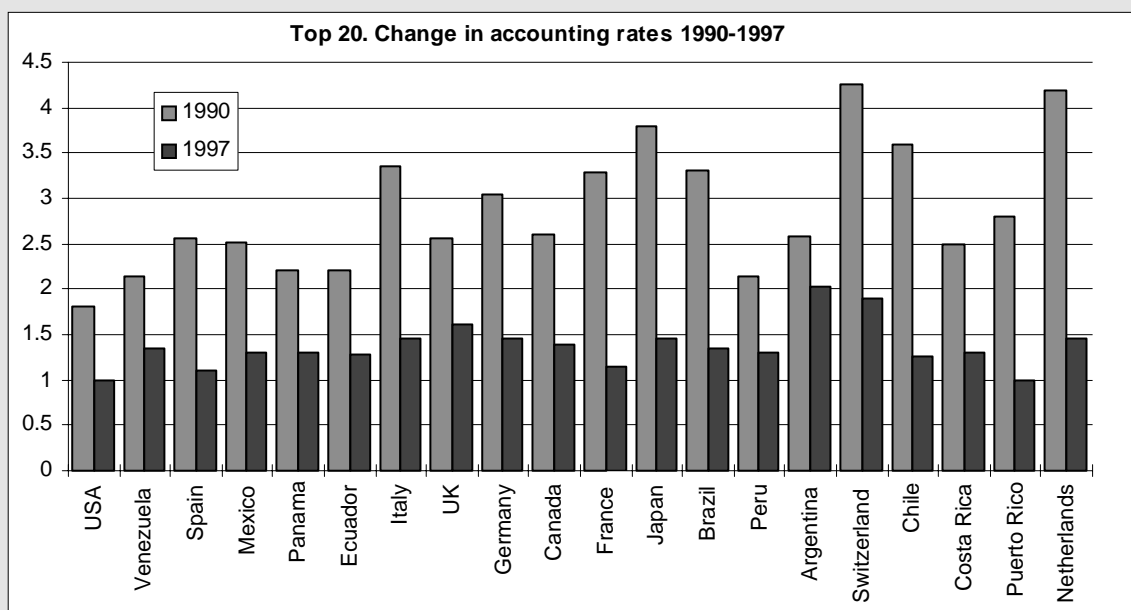
Note that the settlement rate with the US is now \$0.50, with negotiations underway that are likely to reduce this rate further.

More important still, is the current balance of payments from settlement rates. The US carriers are the largest source of net income for Colombia from international long distance. In fact, the United States accounts for 83.3% of the total net settlement payments, even though it accounts for only 67% of the total traffic. The main reason for this is that international traffic between Colombia and other countries is far more balanced between incoming and outgoing than is the case with the United States.

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Figure 3.2 :Change in accounting rates

Top 20 correspondents, 1990-97



Source: CRT and Telecom.

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Table 3.5: Colombia's settlement rates and international call tariffs,
Top 20 correspondents, in US\$ per minute

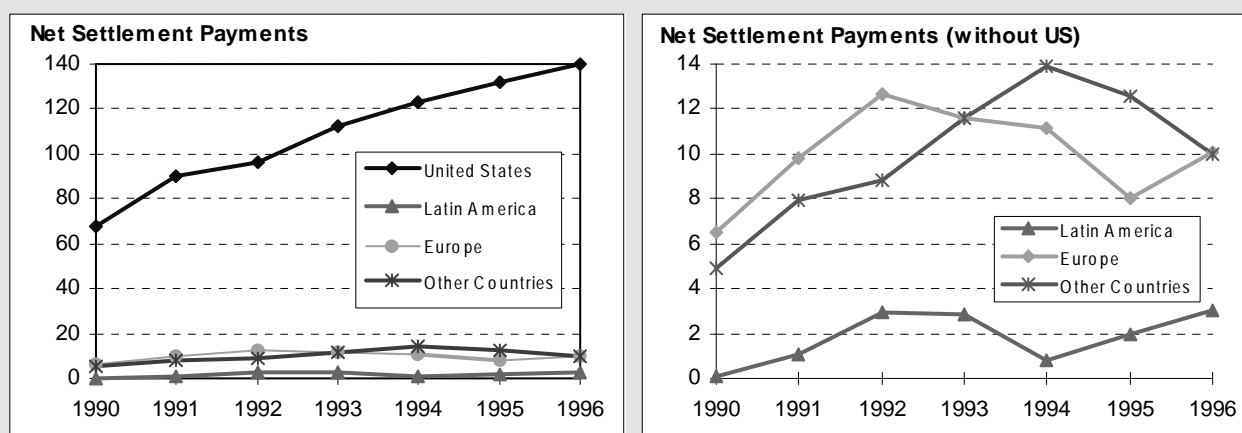
| Colombia settlement rates and international call tariffs | | | | Call Tariff (US\$/min) |
|---|-----------------------------|------|------|---------------------------|
| Connecting Country | Settlement Rates (US\$/min) | | | 1997 |
| | 1995 | 1996 | 1997 | |
| United States | 0.65 | 0.63 | 0.55 | 1.25 |
| Venezuela | 0.72 | 0.65 | 0.65 | 1.00 |
| Spain | 0.72 | 0.72 | 0.54 | 1.37 |
| Italy | 0.83 | 0.72 | 0.72 | 1.75 |
| Mexico | 1.18 | 0.79 | 0.65 | 1.37 |
| Panama | 0.75 | 0.75 | 0.65 | 1.37 |
| Canada | 0.70 | 0.70 | 0.70 | 1.50 |
| Ecuador | 0.72 | 0.65 | 0.65 | 1.12 |
| Germany | 1.01 | 1.01 | 0.72 | 1.62 |
| UK | 1.00 | 0.92 | 0.79 | 1.37 |
| France | 0.79 | 0.79 | 0.58 | 1.75 |
| Japan | 1.24 | 1.08 | 0.72 | 2.24 |
| Brasil | 1.41 | 0.65 | 0.65 | 1.75 |
| Neths. | 1.77 | 0.94 | 0.72 | 2.00 |
| Switz. | 1.44 | 0.94 | 0.94 | 2.24 |
| Costa Rica | 1.13 | 0.65 | 0.65 | 1.62 |
| Peru | 0.72 | 0.65 | 0.65 | 1.12 |
| Argentina | 1.30 | 1.30 | 0.83 | 1.50 |
| Chile | 1.41 | 0.65 | 0.65 | 2.00 |
| Sweden | 1.65 | 0.94 | 0.94 | 2.00 |

Source: CRT and Telecom.

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Figure 3.3: Net Settlement Payments

With and without the United States, 1990-1996



Source: CRT and Telecom.

The second and third largest sources of net settlement payments to Colombia are, as a group, Europe and “other countries” –in which those with high traffic include Japan and Canada. Net settlement payments with Latin America are the lowest, with only a US\$ 3.06-million surplus in 1996.

Table 3.6: Total Net Settlement Payments

USD million

| Year | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | Total | % of total |
|-----------------|-------|--------|--------|--------|--------|--------|--------|--------|------------|
| Country | | | | | | | | | |
| United States | 67.38 | 89.90 | 96.19 | 112.52 | 123.41 | 132.09 | 139.61 | 761.09 | 83.32% |
| Latin America | 0.08 | 1.03 | 2.90 | 2.87 | 0.82 | 1.95 | 3.06 | 12.71 | 1.39% |
| Europe | 6.53 | 9.83 | 12.66 | 11.62 | 11.14 | 8.01 | 10.09 | 69.88 | 7.65% |
| Other Countries | 4.93 | 7.96 | 8.83 | 11.60 | 13.90 | 12.54 | 9.98 | 69.75 | 7.64% |
| Total | 78.93 | 108.71 | 120.57 | 138.61 | 149.27 | 154.59 | 162.75 | 913.43 | 100.00% |

Source: Case Study.

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4 COST EVALUATION OF INTERNATIONAL TELECOMMUNICATIONS SERVICES

The issue of costs of international telecommunications services is both complex and controversial, as there is no common agreement on either the theories or the methodologies for measuring the cost components that should be attributed to terminating international telephone traffic. Submitted separately with this report is an in-depth Review of Cost Issues in International Settlements, which both provides a discussion of some of the most important and controversial issues surrounding certain proposed cost methodologies (particularly that of the US Federal Communications Commission), and offers a framework for an alternative approach to developing costs to serve as a basis for future revisions to the international settlements regime. For the purposes of this report, we summarize below the key elements and issues of the alternative methods and calculations, including the “Average Reference Cost” method utilized by the CRT in Colombia.

Beyond methodology debates, the determination of international service costs is limited by the availability of reliable, detailed cost data, regardless of the method used to evaluate that data. Further, where certain cost data may be available, this information is among the most commercially sensitive to carriers such as Telecom, especially in an environment of emerging competitive forces. Consequently, the data and calculations presented below are in summary form, and provide a basis for understanding the relative magnitude of service costs, without necessarily quantifying specific facility cost inputs.

4.1 The ITU TAS methodology

The general framework for calculating international telephone service costs defined by ITU-T Recommendation D.140 has been widely accepted as a de facto standard, subject to interpretation mainly in terms of how to calculate its various elements. This approach begins by defining three basic groups of network components associated with international service:

1. International transmission facilities
2. International switching facilities
3. National extension

The ITU recommends calculating both the direct costs of facilities in each group (e.g., earth stations, cable systems, international gateway exchanges and operations centres) required to provide international telephone service, as well as the indirect costs (administrative, overhead, etc.). For the first two components, this process simply involves allocating the total costs of these dedicated international facilities between “telephone” (i.e., switched voice service) uses, and other (e.g., dedicated line) uses.

The concept of the “national extension” is the source of most controversy, and subject to the widest range of interpretation. In principle, this element measures the cost required to transmit calls from the point at which they leave the international gateway, across the national and local network to the termination point. (In the case of outgoing international calls, it is the same cost, measured in the opposite direction.) Because the facilities involved are jointly used for all other national telephone traffic, and their costs may differ under alternative assumptions, it is problematic to define a single allocation formula or theory. This is especially true for the costs of the “local loop,” or customer access line, which are generally non-traffic sensitive (fixed) costs, and which have, in many countries, traditionally been greatly supported by revenues from usage-based services, including national and international long distance, and international settlement revenues.

The ITU methodology does not take a strong position on the means to calculate national extension costs for purposes of developing revised international settlement rates. It recommends including some unspecified allocation of costs for national exchanges and transmission facilities, and “if appropriate and identified under a bilateral or multilateral agreement, the local loop.” In one key situation, however, the ITU amplifies on this position: for countries such as Colombia, where the international carrier is separate from the national or local carrier, and must itself pay an access charge for terminating international traffic, the ITU recommends that this access charge should be the basis for national extension costs allocated to settlements as well. This implicitly would include any universal service or local loop cost component included in such access charges.

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4.2 The FCC “Tariffed Components Price” methodology

The FCC, in developing its “benchmark” rates for international settlements between United States carriers and other countries, follows the basic ITU framework, adopting estimation methods for costs of international transmission and switching, and for national extension. Rather than pursue bilateral settlement rate negotiations, however, utilizing the ITU proposed methodology and country-specific cost data and calculations, the FCC chose to develop worldwide average cost benchmarks, based not upon costs but principally upon tariffs for services in other countries.

This so-called “tariffed components price” (TCP) methodology is based upon several key simplifying assumptions. First, it assumes that tariffs for telephone services in the subject countries, on the whole, reasonably reflect the underlying costs of those services (indeed, the FCC asserts that such tariffs substantially overstate costs). Second, it assumes that the average of costs (or tariffs) for many different countries in different regions can be taken to represent a global target or “efficient” cost level, toward which all countries (within each of three income groups) should be expected to converge in an increasingly competitive market.

The elements of the FCC method as applied to each of the three components of international telephone service are summarized briefly below:

International transmission

For this component, the FCC assumes that the tariffs charged by a carrier for international private lines represent approximately the underlying costs of international transmission facilities, the same facilities required to provide the transmission component of switched international calls. The FCC's method makes simplifying assumptions for the number of equivalent circuits per 2.048 Mbit/s dedicated channel, and for the average minutes of international usage per derived channel, and calculates the equivalent "cost" per minute for switched transmission facilities.

Most debate over this method has focused on these simplifying assumptions, as the FCC used data from US based carriers to derive average capacity and usage levels per cable, without accounting for the possibility that other countries, particularly in the developing world, would exhibit lower utilization levels than in the United States. The results of the FCC methodology range from 2.4¢ per minute to 25.5¢ per minute. The derived result for Colombia is 5.1¢ per minute. Using alternative data (see below) the CRT has calculated Colombia-specific costs for this component, following the same tariff-based methodology, of 12.5¢ per minute.

International switching

For the international switching component, the FCC did not have access to "tariff" figures for services using equivalent facilities. It instead relies upon the switching cost component of the actual accounting rates used for traffic among the European group of TEUREM countries, as a proxy for the same component between the United States and the rest of the world. The only modification is to divide the world into categories according to the degree of digitalization of the network, assuming that switching costs are higher for less digitalized countries.

The use of TEUREM data has been criticized as being unrepresentative of the switching costs confronting countries elsewhere in the world, especially those with less access to hard currency and volume discount prices for switching equipment, among other disadvantages. The results of this method produce cost components ranging from 1.9¢ per minute to 4.8¢ per minute, with Colombia at the high end of 4.8¢ per minute.

National extension

The FCC's methodology for estimating national extension costs involves the most complicated of its calculations. Tariffs for domestic long distance and local calling are assumed, under this formula, to approximate (or even overstate) the relevant costs of those services. The FCC conducted an in-depth process of calculating weighted averages of incoming international traffic according to the distance the call travels from the international gateway to its termination point, and applied the lowest related domestic tariff for calls of each distance within the sample traffic distribution.

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This method has been the most criticized of the FCC's approach, for a variety of reasons. These include the fact that most domestic call tariffs do not generally cover the costs of service, and are instead typically subsidized by revenues from international service, among other things. The FCC also greatly oversimplified the actual application of domestic tariffs in many cases, including ignoring the role of monthly subscription charges in recovering local network costs. In the case of Colombia, for example, it misapplied the local tariffs for the different *estratas*, among other mistakes.

This method explicitly seeks to eliminate any "subsidy" or universal service support component from the costs applied to national extension of international calls. This is the case even in countries such as Colombia, in which national and international service are provided by separate carriers, where the international carrier must pay access charges to the domestic carrier that may include a universal service component.

The FCC method for this element yielded costs ranging from zero to 25.2¢ per minute. For Colombia, the FCC result was 8.6¢ per minute. Using corrected data for actual tariffs in Colombia, however, the CRT recalculated the FCC's methodology to produce a cost of 17¢ per minute (see below).

Summary average "benchmark" costs

The combined average "benchmark costs" that the FCC has subsequently determined should be used as the basis for future settlement rates between US carriers and those in other countries, fall into three groups, according to degree of economic development. The overall figures are 15¢, 19¢, and 23¢ per minute, to be applied to all countries in each group, regardless of the individual costs calculated by the same method for any particular country. In the case of Colombia, the FCC would apply the combined average cost for "middle income" countries which is 19¢ per minute. The actual combined "cost" calculated by the FCC for Colombia is in fact only 18.5¢ per minute. However, the combined "corrected" result of the FCC tariff-based method would be 34.3¢ per minute.

4.3 DNTA methodology

In response to the evident shortcomings of the FCC methodology, and the fact that the ITU cost methodology does not materially address the costs of the national extension component, David N. Townsend & Associates (DNTA) have devised an alternative proposal for addressing the national extension cost component of international settlements. This methodology, and the rationale for it, is discussed at length in the separate paper on cost issues in international settlements. In summary, the proposed approach would recognize three elements of the costs of transmitting international calls through the domestic network:

Incremental national usage costs.

This component is comparable to the treatment of costs for purely international switching and transmission facilities, basically following the ITU methodology. It assumes that each minute of use imposes the same incremental cost on the facilities that transport the call. Thus, the formula is to divide the total capital and operating costs of national trunks, tandem switches, and local switches by the combined total minutes of use throughout the network. This could be modified to apply separate local and trunk network costs.

Proportionate share of joint and common costs.

This component addresses the capital and operating costs of jointly used facilities (principally the local loop) and common administrative and overhead expenses. All services share these functions, although their costs are fixed rather than usage-sensitive. The method first subtracts revenues from fixed monthly subscription charges from the total, recognizing that these charges directly recover fixed costs. The remaining unrecovered joint and common costs are then divided by total minutes of use in the network to produce an equitable distribution of these costs across all usage services.

Contribution to infrastructure development.

This component addresses the sources of investment financing for network development (as opposed to recurring capital costs associated with previous investments, which are included in the previous element). The objective is to identify forward-looking annual investment requirements, using some reasonable period and level of development. The model subtracts anticipated connection charge revenues from these costs, since connection charges directly pay for network growth, and then divides the remaining investment cost by

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total network minutes of use. This results in an equal degree of support for infrastructure development by all usage services.

This methodology seems to be a reasonable basis for determining appropriate and equitable forward-looking settlement charges, or perhaps terminating access charges, since the results are unlikely to be equal in both directions between two countries. The costs would change frequently as network costs and conditions change. Naturally, accurate calculation of the costs suggested by this methodology depends heavily upon reliable and detailed data for the international and especially national network costs of the operator(s) involved.

Because of the complexity of Colombian telecommunications, with multiple carriers providing separate components of the network across different geographic regions, it has been problematic for this study to obtain adequate cost and usage data, broken down according to the different network facilities, needed to apply this method to Colombian international services. At this same time, however, the CRT has introduced its own cost methodology (see below), particularly for the local operators, which is substantially similar to the above method, and we have therefore relied upon CRT's approach to develop an alternative estimate of national costs in Colombia.

4.4 CRT Average cost reference (Costo Medio de Referencia (CMRef))

This methodology is based upon a model developed by the CRT to allow the calculation of an average cost or as a base for determining local tariffs for basic telephone service. The CMRef methodology incorporates both present costs and future average incremental costs of development. The CMRef methodology also incorporates forward-looking economic efficiency and carrier productivity variables.

Although CMRef was originally designed for determining tariffs in basic service, it is useful as a basis for evaluating the costs of international long distance service. This is particularly true because the industry is familiar with the methodology, and can provide cost information for its calculations. The formula for the CMRef is as shown in Table 4.1.

In the section that follows, we present the approximate results of this method applied to international service costs in Colombia.

4.5 Telecom costs

To determine a useful overall per-minute "cost" to apply to international traffic for purposes of the analysis of this study, it is necessary to consider that the true result should fall within some range of reasonableness, with the precise value being virtually impossible to establish with any certainty. This requirement derives not only from the debates over different methodologies and assumptions, but also from the relative lack of detailed data on facility costs and operating costs. Moreover, costs are anything but fixed in a dynamic telecommunications network, and are in fact shifting regularly, especially where certain costs are dependent upon both domestic and international economic trends, such as exchange rates, inflation, Labor costs, and so on.

We have therefore taken the available information, provided by Telecom, as well as that utilized by the FCC, and calculated a range of costs for the different components of international service in Colombia. The low end of this range would certainly be the FCC result, for many of the reasons mentioned above: its assumptions concerning each of the components appear to understate the actual costs that would be experienced in Colombia.. Thus, the floor cost for international traffic should be taken as the FCC's Colombia-specific figure of 18.5¢ per minute.

Table 4.1: CRT Average cost reference (Costo Medio de Referencia (CMRef))

$$CMREF = \frac{A_O + A_{OC} + VP[G_{AOMn} + r*(Trrn + C_{To} + C_{TEi}) + I_{Ei} + G_{AOMEi} + Imp_n] - VP(I_{CAN})}{VP(D_O + D_i)}$$

Where:

| | |
|--------------|--|
| VP | Defined as: $\sum_{t=1}^N \frac{1}{(1+TD)^t}$ |
| N | Useful life of the telephone system. |
| n | Each of the years of the period of useful life (N), n = (1,..N) |
| R | Profit rate (discount rate) (TD) |
| i | Each year that investment is realized $1. \leq i \leq N$ |
| Ao | Assets of operating telephone system |
| Aoc | Assets of telephone system in construction |
| Cto | Working capital for present needs |
| Gaomn | Expenses due to administration, operations and maintenance of system, not including depreciation from the base year |
| Trrn | Lands associated with the service provision |
| Iei | Investment in expansion plan realized in year i. |
| Ctei | Working capital associated with expansion plans realized in year i. |
| Gaoemi | Incremental expenses of administration, operations, maintenance associated with the expansion plans, not including depreciation |
| Impn | Profit tax |
| Ican | Income from use and access to network by other operators (cellular, local, etc). |
| (Do + D) | Total system demand (expressed as number of lines in service). Correlates maximum system capacity with actual incremental demand due to system expansion |
| Tariff Base: | It is the numerator of the formula for CMRef not including VP (ICAn) |

Source: CRT.

FCC with corrected data

Using the Tariffed Components Price (TCP) methodology as suggested by the FCC –based on ITU D.140, to calculate the three network elements, namely the costs to a national carrier to terminate a call, (a) international transmission, (b) international switching, and (c) the national extension; we have taken as input true values, and thus recalculated the TCP. This permits us to see the degree of the distortion between a calculation done with actual data inputs and the benchmark approach.

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International Transmission

| | |
|--|-------------|
| Average number of minutes per a 64 kbit/s/month circuit: | 8'356 |
| Monthly charge: | US\$ 62'677 |
| Compression factor: | 2 : 1 |

Then: $30 \times 2 \times 8.356 = 501,360$, and $62,677 / 501,360 =$ US\$ 0.125

International Switching

The data obtained from Telecom and CRT supports the same calculation as the FCC, with this component of cost equal to: US\$ 0.048

National Extension

| | |
|---|---------------|
| The average price per minute of national long distance: | COP\$176.53 |
| Official average exchange rate COP/USD for 1996 | COP\$1'036.68 |
| Total | US\$ 0.17 |

The sum of the three elements are then (in USD):

| | |
|----------------------------|-------|
| International Transmission | 0.125 |
| International Switching | 0.048 |
| National Extension | 0.170 |
| Total | 0.343 |

Additionally there is a regulatory requirement that five percent of net international revenues must be paid to contribute to Universal Service costs, and this must be added to result to obtain the final FCC-adjusted cost to the operator for the call termination (\$0.36).

CRT cost calculation

Even this method, however, falls short of the costs calculated using the results of Telecom's CMRef costs for international service, as determined by the CRT. This method basically calculates Telecom's average cost per minute (= international + national components), then adds, for the local segment, the effective access charge paid to local operators, and implicitly paid by Telecom to its own local operations. This calculation reached the result shown in Table 4.2.

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Table 4.2: Termination cost of international calls utilizing the CMRef Methodology

| | |
|---|------------------|
| Year | 1996 |
| 1. Average exchange rate | C\$ 1,036.68 |
| 2. National long distance minutes (mil) | 4,019.4 |
| 3. Outgoing international minutes (mil) | 135.5 |
| 4. Incoming international minutes (mil) | 399.2 |
| 5. Total international minutes (mil) (L3+L4) | 534.6 |
| 6. Total long distance minutes (mil) (L2+L5) | 4,554.0 |
| 7. Access charge and local usage | C\$ 30.00 |
| 8. CMRef for Telecom, annual (mil) | C\$ 1,972,646 |
| 9. Total cost per minute (L8/L6) | C\$ 433.16 |
| 10. % of traffic terminated with Telecom users | 10% |
| 11. International % of total traffic (L5/L6) | 12% |
| 12. Equivalent local access charge (L7x(1-L10)x(1-L11/2)) | C\$ 25.42 |
| 13. Total cost per minute (L12+L9) | C\$ 458.58 |
| 14. Total cost per minute in Dollars (L13/L1) | US\$0.44 |

Both the above method and the correction to the FCC methodology depend upon aggregate data from Telecom for its national operating costs. The cost of national long distance service (\$0.17 per minute in the previous calculation), however, does not distinguish between terminating international traffic in transit, and wholly domestic national traffic, which is likely to make much greater proportionate use of the national trunk network; this cost is probably high for international service, therefore.

On the other hand, the equivalent local access charge of C\$25 (about US\$0.02) is acknowledged by CRT to be low, and will increase substantially in the near future. In addition, CRT policy imposes a Universal Service fee of 5% of gross revenues on all operators, which in Telecom's case is a cost that cannot be avoided, and should legitimately be included in international service costs.

Combining these analyses, we assume for purposes of this study that incremental international service costs are no less than about 25¢ per minute, and this cost would rise to about 35¢ to 40¢ per minute, when including a proportionate allocation of common costs, and the universal service and access charge obligations. For purposes of our analysis, we begin with a Baseline allocated cost of 40¢ per minute, and examine the impact of the different scenarios using alternative, lower cost figures as well.

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5 SCENARIOS FOR CHANGES IN THE INTERNATIONAL ACCOUNTING SYSTEM

This section presents a quantitative and qualitative analysis of the potential effects of alternative scenarios for changes in the present system of international telephone service accounting and settlements. The issues of greatest concern involve direct changes in the settlement rates themselves, and resulting impacts upon net revenues from settlements, as well as indirect impacts of concurrent market changes that relate to international settlements, such as outgoing call tariffs.

The principal concerns regarding this issue for Colombia have to do with the aggressive efforts of the nation's policy-makers, particularly the CRT, to promote the opening of domestic telecommunications markets to competition, and the overall development of the national infrastructure. The strong progress that has been made in Colombia in recent years to accelerate the transition of the telecommunications industry, including the rebalancing of tariffs, introduction of new services, and especially competitive entry, may be at risk if outside forces materially alter the trends of international service revenues. The fundamental question of study, therefore, is the impact of alternative scenarios upon the net revenues to Colombia (whether directly to Telecom, to new competitive international providers, or indirectly to local operators) derived from international services.

To examine alternative scenarios, we have created a robust simulation model of the Colombia telecommunications sector, particularly the international services market. The model permits various assumptions concerning potential traffic growth along each major international route and region (inward and outward), as well as the level of settlement rates (or equivalent charges), outgoing call tariffs, cost levels and changes over time, and demand elasticity. By varying these assumptions under the following series of basic scenarios concerning international settlements policy, we can examine the range of likely impacts of the different options upon the key factors of net revenues (i.e., revenues minus pertinent costs).

5.0 Baseline scenario: No changes in settlements policy

For each scenario examined in this section, we describe generally the assumptions that define the scenario, and the range of input variables used to measure potential impacts, including the most likely outcome for that scenario. All impacts of the scenarios are measured against a Baseline trend for net international revenues, i.e., the difference between all revenues earned from both net settlements and outgoing international call charges, and the total costs of serving both incoming and outgoing international traffic. The Baseline is the presumed set of results that would occur, over a 5-year period, in the absence of any material changes in international settlements policy. This Baseline scenario is described below.

Assumptions

All inputs and assumptions can be varied within the model to test the sensitivity of results. Most can also be varied separately for different countries or regions, for example, to assume different costs or traffic patterns for different locations. These assumptions were used as the starting point for the Baseline scenario, and for each alternative.

Traffic growth. Traffic is assumed to grow over time at a pace that is equal to the average growth rate over the previous 5 years. This applies to both incoming and outgoing traffic, with different growth rates for each of the countries and regions studied. The overall average baseline growth rate is 16.3% per year for incoming traffic, and 14.0% for outgoing traffic.

Cost of international traffic. We use as the base the combined incremental cost and contribution determined by the discussion method above, of \$0.40 per minute. The same cost applies equally to all incoming and outgoing international minutes. This cost represents the marginal cost of international traffic, plus an equitable contribution to common costs, and an element for infrastructure development. Any surplus of revenues above this cost can thus theoretically be applied to network investment.

Cost and tariff changes. We assume no change in international usage costs over the study period. We measure the impacts of possible cost reductions in the sensitivity analysis. For the Baseline, we assume that outgoing international call tariffs do not change to any other country. Since tariffs do not change in this scenario, there is no initial demand elasticity assumption. The assumed pace of incoming traffic growth

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incorporate any implicit price change impacts from other countries. For other scenarios, however, we assume a demand response to domestic tariff changes.

Net international revenues. Baseline net revenues from the international market are defined as revenues from both net settlement payments and outgoing call charges, minus the total costs for international service. This margin, at its present level, is presumed to be an integral component of the existing market structure, serving as a source of infrastructure funding (through access charges and Telecom's direct local investments) and also as a basis for the development of competition. Any reductions in net international revenues are presumed to have a detrimental impact on either or both of these objectives, by directly or indirectly reducing funding for investment, and incentives for competitive entry.

Results

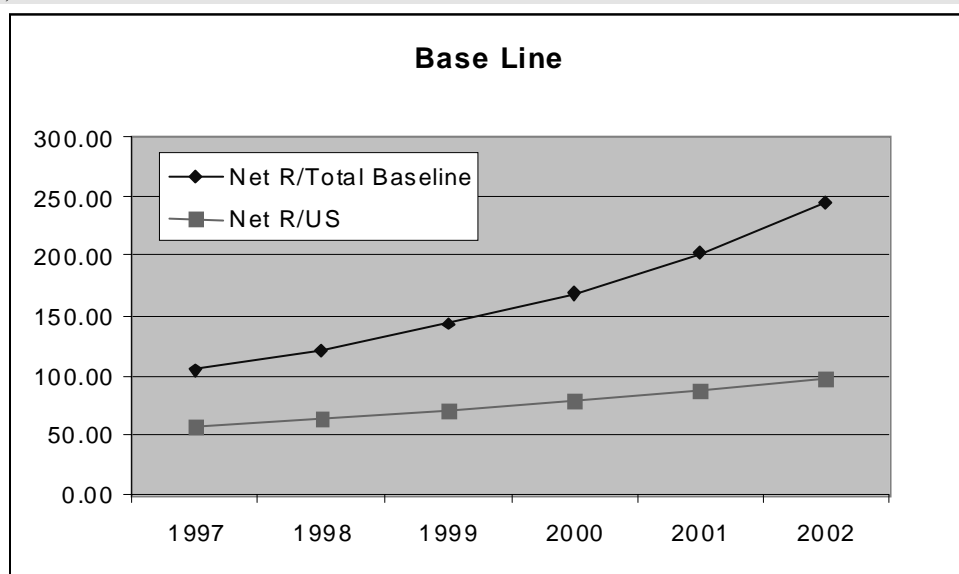
The Baseline results for traffic, net settlement revenues, outgoing international revenues, total costs, and overall net international revenues, are shown below. We also show a comparison between worldwide net international revenues and net revenues from traffic with the United States alone. Recall that "net revenues" is the difference between all international revenues (settlements plus outgoing call charges) and the total costs of serving all incoming and outgoing international traffic.

Table 5.0: Baseline scenario

| Baseline Results | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
|------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Incoming traffic, minutes | 444.80 | 511.90 | 589.19 | 678.26 | 780.91 | 899.22 |
| Outgoing traffic, minutes | 155.14 | 175.53 | 199.09 | 226.34 | 257.95 | 294.67 |
| net settlement revenues (US\$m) | 152.20 | 176.65 | 204.78 | 237.09 | 274.18 | 316.73 |
| Outgoing revenues (US\$m) | 191.98 | 217.35 | 246.71 | 280.75 | 320.33 | 366.43 |
| total cost (US\$m) | 239.98 | 274.97 | 315.31 | 361.84 | 415.54 | 477.56 |
| net international revenues (US\$m) | 104.20 | 119.03 | 136.17 | 156.00 | 178.97 | 205.60 |

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Figure 5.0: Baseline scenario, net revenues, from world and from United States
In US\$ million, 1997-2002



Source: Case study.

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Sensitivity

These results are sensitive to a number of different variables within the basic set of assumptions, including:

Costs. Obviously, the lower the cost assumption, the higher the net revenues, in a linear relationship. For example, if the assumed cost per minute is reduced from 40¢ to 35¢, the net revenues from all international traffic increase by some \$20-million to \$30-million per year. Similarly, if costs decline over time, due to increased efficiencies, net revenues improve. An annual, compound decrease of 3% in costs yields an average increase of about 8% in revenues, or \$18-million per year by the final year.

Traffic growth. Changes in traffic growth affect net revenues more or less depending upon where the traffic is coming from or going to. In the case of the United States, both outgoing and incoming traffic increases yield comparatively small increases in net revenues. By comparison, increases in outgoing traffic to Europe, for example, generate higher proportional revenue increases, given the high tariffs to those countries. The same is true for increasing incoming traffic from those countries with which Colombia has the highest settlement rates, particularly Europe and Asia.

Tariff levels. The Baseline results also vary directly with the tariffs for outgoing traffic, in essentially the same proportion as changes in the cost assumptions. However, when we assume, for some of the scenarios, that tariff changes directly lead to traffic stimulation, the model results are considerably more sensitive to tariff assumptions.

Settlement rates. The fundamental input variable of the model, settlement rate levels affect the results in the same manner as outgoing tariffs, although the impact for any given country depends upon the balance of traffic. In other words, for countries with which Colombia has a net deficit of traffic, and of settlement revenues, increases in the model's settlement rate lead to net decreases in revenue. For those countries with which Colombia currently has a surplus, especially the United States, higher settlement rates yield higher proportionate revenues, and vice versa. In some cases, the traffic flows are nearly balanced today, but the growth trends might lead to a reversal of the present surplus or deficit, in which case changes in settlement rates have a relatively smaller impact on resulting revenues.

Analysis

We can observe two basic, and fairly obvious, facts about the present status and trends of international telecommunications in Colombia. First, net revenues are substantial, and growing: the estimated surplus for 1997 is about \$100-million, and by 2002 it would rise to over \$200-million, if current trends continued. This gain could be even greater if costs decline, but tariffs and settlement payments do not.

Second, the present and future surpluses are derived substantially from traffic with the United States, both incoming and outgoing. In fact, the combined value of the net surplus is due to outgoing traffic, since the margin above costs is much higher than the margin of net settlement rates above costs. For all countries, the average net settlement revenue per minute of incoming traffic is actually only about \$0.34, which is below our estimated Baseline cost for such traffic. For traffic with the United States, the average settlement revenue per minute is just equal to the \$0.40 cost, while the outgoing net revenue is more than \$0.85 per minute above cost, yielding a surplus of about \$50-million, or half the total for all international traffic. By comparison, the net surplus with all of Latin America is only \$16-million.

The implications of this analysis are important, as it indicates that Colombia effectively only breaks even on settlement revenues, in relation to the estimated costs of serving incoming international traffic. The cost figure we have applied represents both incremental and shared costs, but without contributions from settlements, Colombia's telephone carriers would have to shift far more of their cost recovery burden to local tariffs, which may not be able to sustain the increases, either economically or politically. Thus, in the scenarios that follow, we closely examine, among other things, the question of cost efficiencies – savings in costs that could compensate for reduced settlement payments, and prevent Colombian carriers from incurring deficits for incoming international traffic.

5.1 Scenario 1: FCC benchmark policy

This scenario examines the estimated impact of reducing bilateral settlement rates to the level of 19¢ per minute as of Jan. 1, 2000, as proposed by the FCC's benchmarking Order. This option can be generally

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considered in two ways: first, that the FCC policy would apply only to settlement rates between Colombia and the United States, and second, that settlement rates with all other countries would be reduced to the same 19¢ per minute level. It is possible to test other settlement levels in between.

Assumptions

Settlement rates. The main assumption of this scenario is to move the settlement rate between the United States and Colombia to 19¢ per minute as of January 1, 2000. Initially, we retain other settlement rates at their same levels, but we examine the alternative hypothesis that all settlement rates would follow the FCC's lead.

Traffic growth. Basic traffic growth assumptions are the same as in the Baseline scenario, except that there is a presumption of some demand stimulation in relation to tariff reductions that may correlate with the settlement rate reductions. The initial stimulation effect is assumed to be small, but other assumptions are also examined.

Cost and tariff changes. We again use the Baseline cost figure of 40¢ per minute, which is obviously much higher than the proposed settlement rate. We examine the effects of using different cost assumptions. Also, this scenario assumes reductions in outgoing call tariffs in parallel with settlement rate reductions, and we also examine the sensitivity of this assumption.

Results

The results for the initial run of this scenario, using the assumptions described above (only changing the US settlement rate; small impacts of demand stimulation and tariff changes) are as follows. The figures provided show net settlement revenues from the United States only, in comparison with the Baseline, as only US settlements change under this scenario.

Table 5.1: Net Revenue Impact, FCC Benchmark Scenario

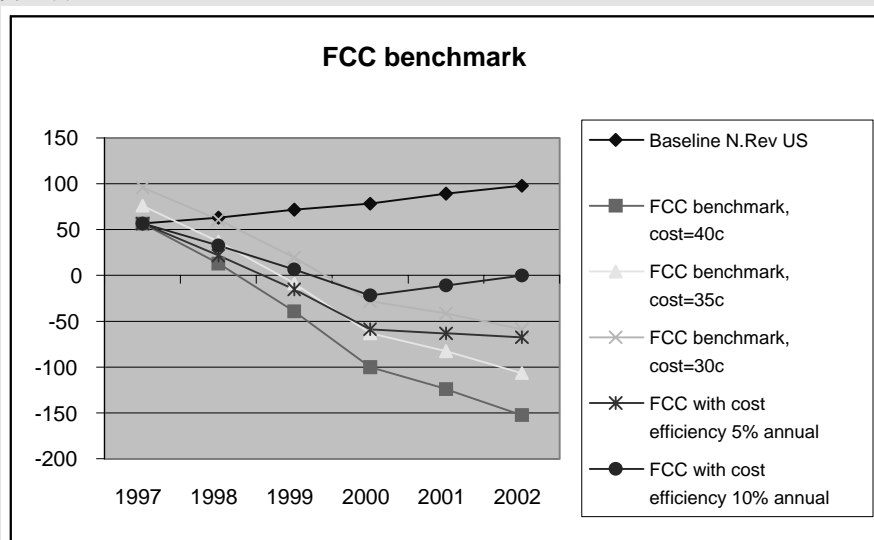
In US\$ million, 1997-2002

| Sensitivity analysis when: | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
|-----------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Baseline Net Revenue from US | \$57.35 | \$63.78 | \$71.00 | \$79.13 | \$88.26 | \$98.54 |
| Cost=40¢ | \$57.40 | \$12.78 | -\$38.84 | -\$99.40 | -\$124.17 | -\$152.67 |
| Cost=35¢ | \$77.00 | \$36.74 | -\$9.54 | -\$63.53 | -\$83.21 | -\$105.90 |
| Cost=30¢ | \$96.60 | \$60.69 | \$19.75 | -\$27.67 | -\$42.26 | -\$59.14 |
| Cost efficiency 5% annual | \$57.40 | \$22.36 | -\$15.99 | -\$58.48 | -\$63.39 | -\$68.03 |
| Cost efficiency 10% annual | \$57.40 | \$31.95 | \$5.68 | -\$21.64 | -\$11.49 | \$0.53 |

Source: Case study.

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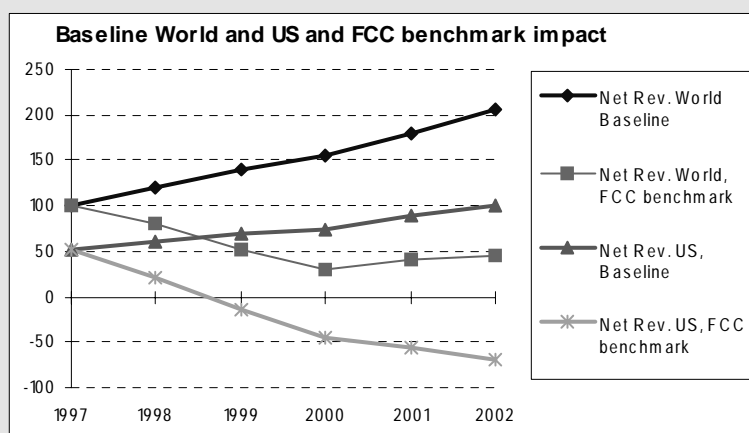
Figure 5.1: Net revenue from United States, under different FCC Benchmark assumptions
In US\$ million, 1997-2002



Source: Case Study.

The following graph compares the change in United States net revenues with the overall net revenues from international traffic worldwide, under this scenario:

Figure 5.2: Comparison of net revenue impact of baseline and FCC scenarios
In US\$ million, 1997-2002



Source: Case study.

Sensitivity

The previous table and graph show the sensitivity of this scenario to the key variable of international service costs. A starting cost figure of \$0.35 cuts the long-term deficit by 30%, while annual cost savings of 5% reduce the 2002 deficit by over 50%. To achieve a breakeven level under the FCC benchmark, starting from current costs of \$0.40 per minute, Telecom and the Colombian industry would have to reduce costs by about 10% per year. But to return to the Baseline level of net revenues, given expected tariff changes and traffic patterns, would require cost efficiency gains closer to 20% per year.

Testing the results of applying the FCC benchmark to all international traffic yields predictably dramatic losses in net revenues. The combined effect by 2002 would be an annual deficit in international service of over \$200-million. If we assume higher stimulation of outgoing traffic, these losses are somewhat mitigated,

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but if large tariff reductions accompany traffic growth, revenue gains are small. Moreover, the more likely trend of an increasing imbalance of traffic with the United States would lead to even greater deficits, as all incoming US minutes would incur net costs of at least \$0.10 to \$0.15.

Analysis

The results of this scenario show why the proposed FCC benchmark settlement rates represent such a troubling prospect for Colombian telecommunications. Because the effective (Baseline) net settlement revenues from the United States only about equal costs today, substantial decreases in the settlement rate would turn incoming traffic into a net revenue loss for Colombian operators. This is a function of the fact that settlements are paid only on the difference in international traffic, so that if the present rate is close to cost, the net payments will not cover the combined costs of all incoming traffic. Whereas today, charges for outgoing calls make up for this deficit on a worldwide basis, and contribute a large surplus in the case of the United States, the scenario's reduction of settlement payments per minute by over 50% would reverse that surplus by 2002, as an increasing imbalance would compound the losses.

The best hope for offsetting these potential losses would appear to lie with cost efficiency gains in both the international and local segments. However, the magnitude of the cost savings required to avoid long-term deficits, at least 10% per year, appears to be highly problematic to achieve on an industry-wide basis. Other alternatives, such as raising (rebalancing) local tariffs, to allow lower domestic access charges, may also be required, if possible. The ultimate conclusion, however, is that the FCC benchmark scenario results in a heavy burden upon the Colombian telecommunications sector, of as much as \$250-million per year in the near term.

5.2 Scenario 2: Staged reduction of settlement rates

This scenario is essentially a modification of the previous scenario, changing three principal parameters of the evolution of settlement rates: slowing the pace at which they decline, increasing the end level at which they arrive, and making their application worldwide. Rather than a short-term, drastic reduction to the rate levels proposed by the FCC, this scenario involves a more gradual decrease, with a higher (more cost-based) eventual settlement rate. Also, this scenario is applied to all regions initially, rather than only to the United States market.

Assumptions

Settlement rates. We assume that settlement rates with all countries decline by a fixed proportion each year, through 2002. At that point, the resulting rates for all countries are equal to 34.3¢ per minute, which is the result obtained utilizing the FCC methodology and corrected data. This is also in the range of appropriate costs determined for Colombia by the various other methods discussed previously. We also examine the alternative impacts of reducing settlement rates to different levels, and of arriving at different (but lower) settlement rates for different regions.

Traffic growth. We again use historical traffic growth trends to all regions as the starting point. We also assume traffic stimulation due to lower tariffs, this time in all directions. Stimulation is higher for countries with higher initial settlement rates.

Cost and tariff changes. Costs are assumed initially to remain the same, as with the other scenarios, but we test the impact of various cost efficiency gains over time. Tariffs for international traffic are assumed to decline more or less in parallel with the reduced settlement rates, so that outgoing international tariffs to all regions from Colombia decrease at least somewhat over time in this scenario.

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Results

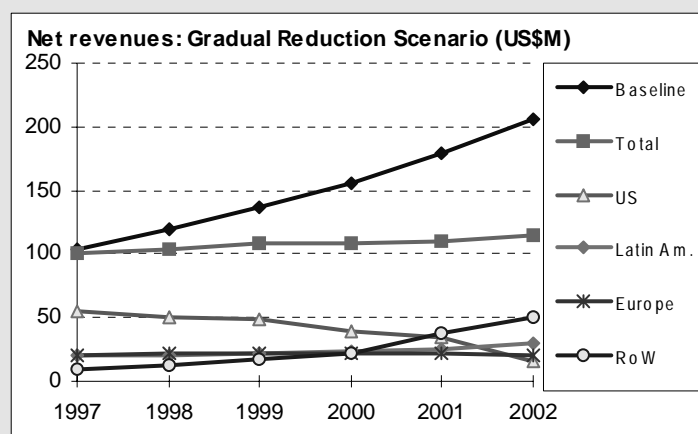
Table 5.2: Scenario 2: Staged reduction of settlement rates

| | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
|----------------------------|--------|--------|--------|--------|--------|---------|
| Incoming traffic | 444.80 | 526.10 | 624.25 | 743.23 | 888.07 | 1065.16 |
| Outgoing traffic | 155.14 | 183.53 | 219.30 | 264.84 | 323.46 | 399.79 |
| net settlement revenues | 152.20 | 165.77 | 180.18 | 195.40 | 211.43 | 228.22 |
| Outgoing revenues | 188.28 | 211.27 | 239.54 | 274.65 | 318.65 | 374.34 |
| total cost | 239.98 | 283.85 | 337.42 | 403.23 | 484.62 | 585.98 |
| net international revenues | 100.50 | 93.19 | 82.30 | 66.83 | 45.47 | 16.59 |
| Net Rev. Base Line | 104.20 | 119.03 | 136.17 | 156.00 | 178.97 | 205.60 |
| Percentage Change | -3.6% | -21.7% | -39.6% | -57.2% | -74.6% | -91.9% |

Source:

Figure 5.3: Comparison of net revenue impact of baseline and Staged Reductions scenarios

In US\$ million, 1997-2002



Source: Case study.

Sensitivity

The above results are based upon the initial Baseline assumptions, and the additional, relatively modest factors for tariff and traffic changes resulting from settlement rate reductions. The key question for sensitivity analysis again involves potential changes in costs, over time. The annual efficiency gain required to retain approximately the original Baseline level of net international revenues is 14% per year, under this scenario. If costs decline only 5% annually, international service still contributes a surplus of some \$111-million by 2002.

If we further assume that tariffs would decline, and both outgoing and incoming international traffic would be stimulated by greater amounts, under this scenario, the impact on the results is somewhat ambiguous. Depending upon the net direction of the changes with various countries, revenues could increase or decrease.

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Analysis

Clearly, Colombia is in a much better position to confront the terms of this scenario, and in fact this has been the general trend for several years, anyway: gradual reduction in bilateral settlement rates with most countries, including the United States. If traffic continues to grow, costs decline, and tariffs are commensurately rebalanced, annual reductions in international settlement rates are eminently sustainable for the Colombian telecommunications industry. The magnitude and timing of these changes, however, are very important to the outcome. As we have shown, the difference between this scenario and the FCC benchmark proposal is not only the level of the settlement rate, but the pace at which rates are reduced over the next five years.

This timing concern is especially critical for the Colombian industry, as it is only just beginning to open up the international market to competition, and market forces in the local and long distance segments are still fairly untested. Large decreases in revenues from international traffic, either directly or through access charges, would likely have the effect of stifling competition, since incentives to enter the market would be greatly reduced. This, in turn, could hamper the goal of greater cost efficiencies, without the discipline of competition to promote greater savings.

Thus, in principle, the scenario of gradual settlement rate reductions is much more favourable than large, drastic reductions. Such reductions, however, could still be harmful if they do not ultimately correspond to the underlying industry costs.

5.3 Sender-keeps-all

This scenario involves a straightforward alternative to changing settlement rates: the elimination of such payments altogether. Each country's international operator would retain all revenues generated by callers within its territory, and pay nothing to terminate calls elsewhere. In principle, this option would assume that there would be a relative balance of traffic and costs in each direction among all countries, such that reciprocal payments for bilateral traffic would be superfluous. In practice, this scenario is potentially more realistic for regional traffic than for global traffic, for example within Latin America (it is already practised among Central American countries).

Assumptions

Settlement rates. For this scenario, we reduce settlement rates to all regions in equal proportions over the study period until arriving at a zero rate by 2002. We also measure the impact separately of eliminating settlement charges only within Latin America (combined with various gradual reductions of rates to other regions).

Traffic growth. Because this scenario presumptively leads to much lower call tariffs worldwide, we assume significant stimulation in incoming traffic due to the elimination of settlement payments. We assume much less stimulation in outgoing traffic, however, as tariff reductions are harder to implement domestically, due to the lost settlement revenues.

Cost and tariff changes. We retain costs the same for the initial run, then test efficiency gain levels. As for outgoing call tariffs, despite the theoretical removal of settlement charges, the only international tariffs that decline in this scenario are those for calls to countries with which Colombia today has a deficit of settlement payments. Other tariffs remain relatively high, as compensation for the lost settlement revenues. We test variations on this assumption.

Results

The results of the scenario of global elimination of settlement charges are illustrated below:

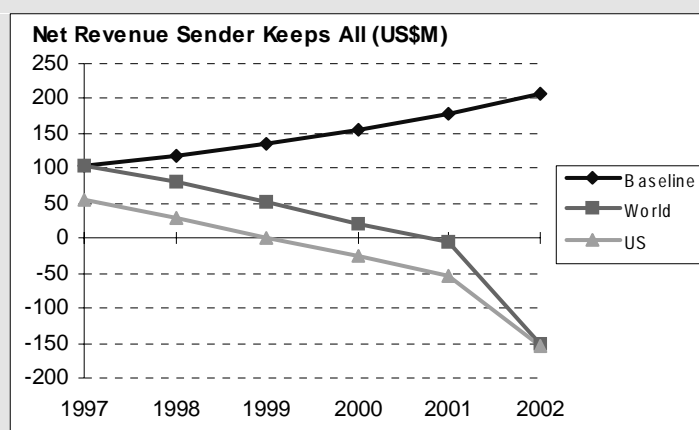
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Table 5.3: Global elimination of settlement charges

| | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
|----------------------------|--------|--------|--------|--------|---------|----------|
| Incoming traffic | 444.80 | 526.84 | 627.89 | 753.62 | 911.72 | 1'112.74 |
| Outgoing traffic | 155.14 | 180.36 | 211.75 | 251.35 | 302.02 | 367.81 |
| net settlement revenues | 152.20 | 126.58 | 105.34 | 87.73 | 73.16 | 0.00 |
| Outgoing revenues | 188.28 | 211.07 | 239.09 | 273.87 | 317.45 | 372.59 |
| total cost | 239.98 | 271.60 | 310.82 | 360.27 | 423.67 | 506.26 |
| net international revenues | 100.50 | 66.05 | 33.61 | 1.34 | -33.06 | -133.67 |
| Net Rev. Base Line | 104.20 | 119.03 | 136.17 | 156.00 | 178.97 | 205.60 |
| Percentage Change | -3.6% | -44.5% | -75.3% | -99.1% | -118.5% | -65.0% |

Figure 5.4: Net revenue impact of Sender keeps all scenario, by region

In US\$ million, 1997-2002



Source: Case study.

Sensitivity

The large losses shown for this scenario result principally from the elimination of settlement revenues from the United States, while retaining all costs for incoming (and growing) traffic. However, the above graph shows that the net impact of a sender-keeps-all policy for most of the rest of the world would not be very detrimental. If we eliminate settlement rates for Latin America only, for example, net revenues for Colombia decline by only \$1.5 per year by 2002, assuming no further change in traffic patterns or tariffs.

When we vary the assumptions for international tariffs and traffic flows between Colombia and the rest of Latin America, we find it is quite possible that Colombia could gain revenues due to a sender-keeps-all policy. This would occur especially if tariffs for calls within Latin America were reduced somewhat, and led to traffic stimulation that increased total outgoing revenues, more than incoming traffic was growing. For example, with a 7% annual decrease in average tariffs to Latin America, combined with a 60% net increase in the balance of outgoing over incoming traffic, net revenues from the region in 2002 would remain very close to the Baseline result, in fact only \$2 million decline by year 2000, not counting administrative and other cost savings.

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If a sender-keeps-all policy for Latin America is combined with the Scenario 2 option of gradual reductions in settlement rates with the rest of the world, Colombia experiences net revenue reductions of up to \$30 million per year for combined international traffic. These losses could, however, be offset by annual cost reductions (or efficiency increase) of about 9% per year for the industry as a whole. Again, various changes in tariffs and traffic flows could affect the magnitude of these results, with the best case scenario being a net shift of the international traffic balance in favour of outgoing, rather than incoming traffic.

Analysis

A worldwide policy of eliminating settlement charges would be disastrous for countries like Colombia, which not only are fairly dependent upon settlement revenues, but whose cost structure is substantially higher than major correspondent countries such as the United States. Moreover, sender-keeps-all depends upon both equivalent costs and equivalent traffic flows in each direction, or one party will by definition lose out. The recent trends of international traffic for Colombia show far greater growth in incoming calling from the United States than in outgoing, meaning that a move to a sender-keeps-all policy would be impossible financially any time in the foreseeable future.

The option of a regional elimination of settlement charges is, however, more realistic. It would essentially amount to a gamble by Colombia and the other countries in the region, that their net outgoing revenues would be greater than under a continued settlements policy. Since there would not be any payments for incoming traffic, each country would have incentives to maximize its outgoing calling to the region, and this could lead to lower tariffs, traffic stimulation, and arguably greater regional integration.

There are barriers to a Latin America sender-keeps-all policy, however, which would need to be addressed in any policy or negotiations over this option. First, much bilateral traffic between countries in the region today does not, in fact, pass directly from one country to the other, but instead is connected via transit, typically through the United States. This has the perverse result of shifting intra-region settlements outward, to the United States. For a true regional system to work, there should be better connection and routing of traffic among Latin American countries, to avoid the extra potential costs of transit traffic.

Also, there are inherent risks in a sender-keeps-all system, especially in emerging competitive markets, of “abuse” of the system by some carriers, through practices such as regional hubbing. This concept involves inviting carriers from outside the region to send all regional traffic to a single hub, for redistribution to other countries, presumably for a discounted tariff. If such practices occurred, they could upset the balance necessary for a sender-keeps-all system to work effectively. However, if an actively competitive regional market for international telecommunications emerges, it may eventually be possible to pursue this policy with a minimum of restrictions, to the benefit of the region as a whole.

5.4 Scenario 4: Unilateral termination charges

The final scenario category we examine is an alternative to traditional settlement rate policy, which removes the assumption that payments for terminating traffic must be equal in both directions, and introduces uniformity within each country in charges. This is the replacement of bilateral accounting rates with unilateral termination charges or access charges, based upon each country’s unique cost of terminating incoming international traffic. There are two basic types of termination charges:

Combined termination charges

Incoming traffic access charges, based upon the overall combined costs of international services. All incoming service, from all other countries, would pay the same charges.

Unbundled termination charges:

Separate termination charges for the different components of international transmission, switching, and national extension, based on the isolated cost of each component. These charges could be available for foreign carriers that might be allowed to construct their own facilities within Colombia, to avoid using part of the domestic network. Such carriers would only pay the terminating charge for the network components used to complete a given call.

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Assumptions

Termination costs and charges. It is difficult to anticipate what precise form termination charges might take, especially in an unbundled scenario. One likely possibility is that the network components for international transmission would be removed from the cost equation, as international (especially US) carriers would be inclined to deliver traffic directly to a gateway, paying the transmission component themselves, or through a 3rd party transmission wholesale provider. We therefore assume that the cost bases for terminating charges would be approximately the previous settlement-based cost of 40¢, minus the cost for international transmission, which we estimate is perhaps 15% of the total. The resulting cost of 34¢ per minute is the basis for a transition to uniform terminating access charges. This figure can then decline over time with cost efficiencies.

To the extent further unbundling of the domestic network might be pursued in the future, the effective access charge received by Colombian carriers would be lower, and we estimate this impact in the sensitivity analysis.

Importantly, the terminating charge paid by Colombia to other countries would not likely be the same, and in the case of the United States, Canada, and the U.K., at least, it would be much lower. For these countries, we assume incoming access charges would be between 10¢ and 15¢ per minute, based upon the cost levels the FCC has ordained for the United States, and the European Union interconnection charge mandates. These costs could be significantly lower still. For other Latin American countries, and for the balance of other countries in the world, we assume that terminating costs and charges would be the same as for Colombia.

Traffic growth. The impact of a new system of terminating charges upon international traffic patterns is also very speculative. If we assume that tariffs will reflect changes in settlement/access costs, then there may be larger proportionate reductions in outgoing tariffs to the United States than in those for calls into Colombia. This trend should cause a shift in traffic balances, to some degree. We initially assume a stimulation rate for lower cost countries that is 1% greater for outgoing traffic.

Cost and tariff changes. The costs to Colombian carriers under this scenario for outgoing international traffic would not be the same as for incoming terminating traffic. Whereas we remove the cost of international transmission from the incoming service, this cost remains (and might be higher) for outgoing traffic. Thus, we retain the initial 40¢ per minute cost for outgoing minutes, but test the sensitivity of the results to substantial cost reductions. Tariff changes, as mentioned above, might be proportionately greater with this scenario, so we assume a high correlation between the terminating access charge in other countries, and changes in the tariffs for calls to those countries.

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Results

Table 5.4: Unilateral termination charges

| Termination Charges | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
|----------------------------|--------|--------|--------|--------|--------|--------|
| Incoming traffic | 444.80 | 517.67 | 603.81 | 705.98 | 827.67 | 973.22 |
| Outgoing traffic | 155.14 | 174.85 | 199.23 | 230.00 | 269.60 | 321.59 |
| net settlement revenues | 249.39 | 272.05 | 297.09 | 324.76 | 355.38 | 389.29 |
| Outgoing revenues | 188.28 | 212.69 | 242.97 | 281.31 | 330.83 | 396.02 |
| total cost | 239.98 | 277.01 | 321.22 | 374.39 | 438.91 | 517.93 |
| net international revenues | 197.69 | 207.73 | 218.84 | 231.68 | 247.30 | 267.39 |
| Net Rev. Base Line | 104.20 | 119.03 | 136.17 | 156.00 | 178.97 | 205.60 |
| Percentage Change | 89.7% | 74.5% | 60.7% | 48.1% | 38.2% | 30.1% |

Source: Case study.

Sensitivity

The critical variables in this scenario are the costs of both incoming and outgoing traffic, including the differential between those costs. The smaller the differential, the lower the net revenues under any assumption of the absolute costs, and of traffic imbalances. Our assumption of \$0.10 to \$0.15 for the cost of terminating traffic in the United States and Europe is certainly realistic, but the question is how much lower could that cost go in Colombia, with what effect on net revenues? Testing this scenario at costs of \$0.35, \$0.30, and \$0.25 yields significantly lower net revenues, as do assumptions of cost efficiency gains for Colombia of 5% and 10% per year:

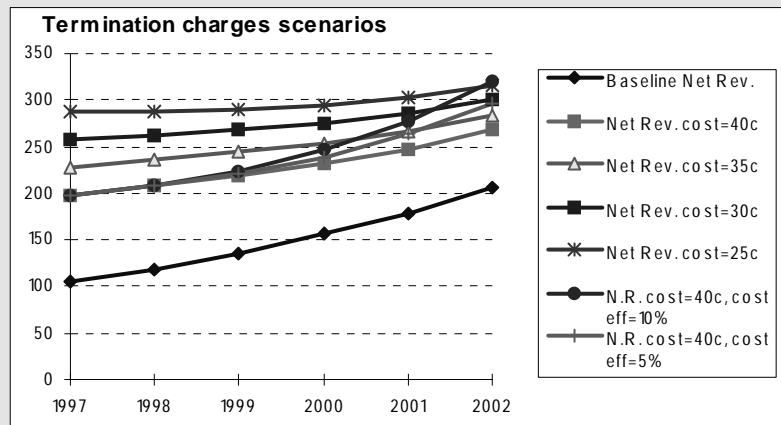
Table 5.5: Termination Charges scenarios

| Termination Charges scenarios | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
|-------------------------------|--------|--------|--------|--------|--------|--------|
| Baseline Net Rev. | 104.20 | 121.66 | 142.99 | 169.33 | 202.19 | 243.63 |
| Net Rev. cost=40c | 197.69 | 207.73 | 218.84 | 231.68 | 247.30 | 267.39 |
| Net Rev. cost=35c | 227.69 | 235.38 | 243.88 | 253.88 | 266.48 | 283.47 |
| Net Rev. cost=30c | 257.69 | 262.23 | 267.66 | 274.73 | 284.69 | 299.55 |
| Net Rev. cost=25c | 287.68 | 288.01 | 289.78 | 293.87 | 301.74 | 315.63 |
| N.R. cost=40c, cost eff=10% | 197.69 | 208.81 | 224.38 | 246.17 | 276.79 | 320.06 |
| N.R. cost=30c, cost eff=5% | 197.69 | 208.28 | 221.72 | 239.36 | 263.25 | 296.49 |

Source:

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Figure 5.5: Sensitivity modelling of net revenue impact of termination charges scenarios
In US\$ million



Source: Case study.

Shifts in the balance of traffic between countries also greatly affect the results of this scenario. If we assume that Colombia-to-United States traffic grows at the same pace as traffic in the reverse direction (a large change from recent trends), the impact would be to reduce the net revenue gains of this scenario by \$55 million in 2002. If lower terminating costs in other countries lead to lower outgoing tariffs in Colombia, then the large net gains of this scenario would also be mitigated considerably.

Analysis

The initial result of this scenario, utilizing the cost levels described in this study for Colombia, and widely assumed for the United States and similar countries, is to produce a substantial increase in net international revenues to Colombia, although the magnitude of the increase declines over time. The largest component of the increase would come, not surprisingly, from the United States, as the present system of making net settlement payments of 50¢ per minute would be replaced by gross in-payments of 40¢ for all incoming traffic, and out-payments of only 10¢ per minute. Given the large traffic imbalance, this results in average revenue per minute to Colombia from net termination charge payments of about 35¢ per minute of incoming traffic. This compares with net settlement payments today of virtually zero per incoming minute.

It is interesting to note the impact of lower assumptions for the terminating cost. Lower costs result in higher net revenues, even though they reduce incoming terminating charge payments, because those costs are incurred for outgoing traffic as well. This means that, under a cost-based terminating charge system, cost efficiencies can be reflected in lower outgoing call tariffs without losing net revenues, and the resulting traffic stimulation can improve total industry revenues, even while the shift of traffic (and lower charges) leads to lower incoming payments. This is precisely the goal of market-based settlements policy reforms.

In principle, a system of terminating charges would be the most economically efficient in the real-world environment were costs differ across different countries. This is assuming such charges would be accurately based upon appropriate terminating costs for all countries. Moreover, as the international (and domestic) markets open to further competitive entry, cost-based and unbundled access charges would tend to promote greater efficiency throughout the industry, as operators could more frequently choose between paying other carriers to transmit their traffic, and providing facilities themselves, based upon the differential costs.

The fact that, in the short run, cost-based terminating charges would lead to greater payments from lower cost countries to higher cost countries reveals that the present settlements system is not, in fact, so inefficient as it has been described by some. In the case of Colombia, settlement revenues are just about equal to the full cost of incoming traffic, when a reasonable share of common costs is included. As discussed above, cost-recovering termination charges could serve a more effective purpose by creating greater incentives to reduce those costs and stimulate outgoing traffic, while the settlements system tends to encourage an imbalance of incoming traffic.

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Under this scenario there is the possibility that the reversal of trends might be carried too far, leading to a phenomenon that has been described as “reverse call-back,” wherein originating traffic moves disproportionately to higher cost countries, as carriers seek to pay the lower terminating charges. This can only occur, however, where there are opportunities for competing international carriers to “cream-skim,” by charging low tariffs to certain users for calls to certain countries, without incurring the same system-wide costs as national operators. In Colombia, this prospect would essentially be prohibited by the CRT’s policy of requiring new entrants to the international market to provide equivalent coverage, universal service contributions, and so forth, as incumbent carriers.

6 CONCLUSIONS

The Colombian telecommunications sector, which has always been unique within the region, is moving impressively in the “right” direction: opening markets, rebalancing tariffs, promoting efficiency and market-based development, introducing new technologies while expanding basic service and reducing costs. In the international arena, Colombia is a leader in pursuing responsible reforms, regional and global co-operation, and equitable policies. This is not an advertisement for Colombian telecommunications or its regulator, the CRT, but a finding of this study, which involved the consultants very closely in the workings of the industry and its regulator. Interestingly, these developments have occurred on the initiative of the country’s government and industry, without particular pressure from outside sources, in recognition of the demands of the evolving telecommunications field.

In this environment, the radical “benchmarks” policy proclaimed by the United States Federal Communications Commission has already created a disruptive, counter-productive effect, as the fears of revenue losses and market distortions have greatly distracted from and hindered the movement toward competitive openings and regulatory reforms. If that scenario were to be followed to its intended conclusion, the consequences for Colombia would be highly damaging in the short run. In the first place, Colombian law and CRT regulations would actually prohibit the “below-cost” settlement payments implied by the FCC’s 19¢ benchmark, and thus a legal stand-off would be imminent. More important, the potential loss of some \$250-million in net revenues over a three year period would have a stifling impact upon national development plans, and also upon the process of market opening.

By contrast, the trend that Colombia has already been following in the area of settlement rates – gradual reductions with most of the world – matches the pace at which the industry as a whole is transforming. If this pattern were only to continue for the next 5 years, Colombian law would again require that all service prices, including settlement rates, be based upon costs, and the result would be lower rates and tariffs, without huge financial losses and curtailment of investment and competition.

Perhaps more optimistically, Colombia would benefit most from a movement toward cost-based pricing for external as well as internal services, i.e., charges for terminating international traffic in other countries that also reflect their costs, not 50% of the average cost between the two. The scenario of unilateral cost-based termination charges, if implemented gradually and in concert with the other market changes taking place, holds the most promise to promote and encourage the types of ground-breaking industry reforms that Colombia is undertaking already.