

APPENDIX E

Tariffed Components Price Methodology

I. Introduction

In this Appendix, we describe the "tariffed components price" (TCP) methodology which we adopt in this *Order* as the basis for calculating international settlement rate benchmarks. Pursuant to this methodology, we develop prices for each of the three network elements that are used to provide international telephone service. We describe in this Appendix the structural framework we developed to calculate these prices, as well as the data collection procedures and tariff rate information we used as inputs in the model. We explain the estimation procedures we used to compute the network element prices, including the underlying assumptions for each element, and present several examples to demonstrate the estimation procedures. Finally, we provide a summary of each country's prices and append the underlying basic tariff rate information for each of the countries in the study.

Pursuant to the TCP methodology, we calculate prices for the three network elements that are used to provide international message telephone service (IMTS) identified by the International Telecommunication Union's Telecommunication Standardization Sector (ITU-T) in Recommendation D.140.¹ These three elements are: (1) international transmission facilities; (2) international switching facilities; and (3) national extension (domestic transport and termination). We use foreign carriers' unbundled tariff rates to calculate a price for two of these elements and information published by the ITU to calculate a price for the remaining element. The prices we calculate are based on cost components identified by the ITU for each element. We refer to these prices as the "tariffed component price" of each element, and the sum of these prices for each foreign carrier as the "tariffed components price" (TCP).

Table 1 summarizes the TCPs for each country. More detailed results, which include each of the component elements described in this report, are presented in Tables 2 through 5.

¹ See ITU-T Recommendation D.140, *Charging and Accounting Rate Principles for International Telephone Service, Annex A, "Guidelines for the cost elements to be taken into account when determining accounting rates and accounting rate shares for the international telephone service,"* Geneva (1992). ITU-T Recommendation D.140 calls for transparent, cost-oriented, nondiscriminatory accounting rates.

Table 1. Tariffed Components Prices
(per minute)

<u>Country</u>	<u>TCP</u>	<u>Country</u>	<u>TCP</u>
Argentina	32.1¢	Jordan	23.0¢
Australia	18.7¢	Kenya	42.6¢
Austria	31.4¢	Korea	12.8¢
Bahamas	19.9¢	Kuwait	9.0¢
Barbados	12.0¢	Malaysia	22.4¢
Belgium	14.1¢	Mexico	16.8¢
Bermuda	9.9¢	Netherlands	9.8¢
Brazil	27.8¢	New Zealand	23.8¢
Chile	18.6¢	Nicaragua	12.3¢
Colombia	18.5¢	Norway	11.6¢
Costa Rica	10.3¢	P.R. of China	17.7¢
Czech Republic	19.0¢	Pakistan	26.7¢
Denmark	14.4¢	Panama	19.4¢
Dominican Rep.	14.5¢	Peru	16.1¢
Ecuador	10.3¢	Philippines	23.9¢
Egypt	17.2¢	Poland	24.6¢
El Salvador	11.8¢	Portugal	23.9¢
France	17.5¢	Russia	35.4¢
Germany	19.8¢	Singapore	7.6¢
Greece	23.0¢	South Africa	16.9¢
Guatemala	10.3¢	Spain	18.1¢
Guyana	12.0¢	Sweden	10.0¢
Haiti	30.4¢	Switzerland	20.6¢
Honduras	16.6¢	Taiwan	13.9¢
Hong Kong	7.0¢	Thailand	17.1¢
Hungary	14.4¢	Trinidad	14.6¢
India	31.2¢	Turkey	17.9¢
Indonesia	35.5¢	U.A.E.	7.7¢
Ireland	18.0¢	United Kingdom	13.0¢
Israel	8.5¢	Uruguay	22.3¢
Italy	18.2¢	Venezuela	23.8¢
Jamaica	8.7¢	Vietnam	24.7¢
Japan	19.7¢		

II. Structural Framework

The TCP methodology is based on the framework for calculating cost-oriented accounting rates set forth in ITU-T Recommendation D-140. Recommendation D.140 describes the guidelines for cost elements used by carriers to terminate international calls and identifies the three network elements that are used to provide international telephone service: (1) international transmission facilities, (2) international switching facilities, and (3) national extension. International transmission facilities consist of international terrestrial transmission or submarine cables, international satellite transmission, or a combination of these facilities. The facilities that comprise this network element include the links between the earth stations or cable landing stations and the international switching facilities. International switching facilities consist of international switching centers, including their associated transmission and signalling equipment. Finally, the national extension element includes that part of the national exchanges, national transmission facilities, and the local loop (if specified in the operating agreement between carriers) that is used to terminate international telephone service.

In the absence of information about foreign carriers' costs of terminating international traffic, we use foreign carriers' tariff rates that correspond to the network elements of the

structural framework adopted by the ITU-T in Recommendation D.140 and information published by the ITU to calculate benchmarks that more closely approximate costs than current settlement rates.

III. Data Collection

The data we use to calculate settlement rate benchmarks was obtained through a study of foreign carriers' tariffed rates undertaken by the International Bureau. The Bureau included seventy-one countries in its original study sample. The Bureau selected sixty of the countries in the study because they represent the largest volumes of international service with the United States and the remaining eleven countries to ensure proper representation of all geographic regions. These countries accounted for 95 percent of the U.S. international telephone traffic in 1994.²

The Bureau sent a questionnaire to these seventy one-countries seeking tariff information for international dedicated (private line) services from each country to the United States and for local and long distance service within the countries. The Bureau received data for the study from published tariffs or directly from the carriers. The data collection period was the fourth quarter of 1995 through June 1996. During this time, the Bureau supplemented the original information with revisions and corrections. Responses from sixty-five countries contained information that the Bureau deemed usable for the study. The Bureau excluded the other six countries from the study due to data deficiencies.

Data for the International Transmission Component: International telephone service between the United States and most countries included in the sample is transmitted over international telephone networks equipped with high speed digital circuits, either T1 (1.544 Mbps) or E1 (2.048 Mbps) circuits. Most carriers offer international dedicated service to their customers using the same type of high capacity circuit. Thus, we use foreign carriers' private line rates for dedicated circuits to calculate the TCP for the international transmission component. The Bureau sought in its questionnaire detailed information for all available rates for international dedicated services between the sample countries and the United States, such as the tariff rates for service offerings of all pertinent bandwidths, the transport media used to provide the service offerings, the availability of multi-year pricing plans, and any volume discount options offered to users. Such tariff information is not available for all the countries in the Bureau's study. The carriers in Guyana and Haiti, for example, do not publish tariffs for international dedicated circuits, but they offer dedicated service to the United States under negotiated rates. For these two carriers, we use the highest tariff rate for dedicated service to the United States using a T1 or E1 circuit from another country in the same region as a proxy for the tariff rate for service from Guyana and Haiti. For Guyana, we use the price of an E1 circuit available for international service in Brazil. For Haiti, we use the price for a T1 circuit in Barbados. For other carriers that do not offer international dedicated service with either T1 or E1 circuits, we use the published

² The countries and their associated minutes of service for 1994 are listed in Attachment A.

tariff rate for the highest bandwidth circuit.³ We list the tariffs for international dedicated service used in the study in Attachment C.

Data for the National Extension Component: For the national extension component, the Bureau solicited detailed information in its questionnaire on the prices charged to the carriers' customers in each country for domestic direct dialed telephone service. For each country in the sample, the Bureau collected information on the tariff rates for all available rate periods and rate bands, primarily from public telephone directories. This information includes the hours of the day and days of the week when the rates are in effect, and the distances for the rate bands. The Bureau also collected information on volume pricing plans for domestic telephone service, network configuration for international telephone traffic, domestic numbering plan, and other related information. The tariffs for domestic telephone service used in the study are characterized by substantial structural variations. The number of rate periods, for example, varies from one to five, and the number of mileage rate bands ranges from one to fourteen. Several carriers have tariffs with different rate periods for local service and long distance service. In three of the countries in the study, Barbados, Hong Kong, and Kuwait, consumers are not charged on a per minute basis for domestic calls. Some carriers offer volume discounts, *e.g.*, Germany, Japan and Norway. These discounts are factored into the study. We provide a detailed summary of the tariff rates for domestic public switched telephone service used in the study in Attachment D.

Data for the International Switching Component: We use data published by the ITU-T to calculate a TCP for the international switching facilities rate component.⁴

IV. Estimation Procedures

We use the information collected from the Bureau's study, along with ITU-T data, to estimate a price per minute to terminate switched message telephone service from the United States. As noted above, we refer to the composite of the prices for each network element as the tariffed components price (TCP) of a country. Again, the three network elements are: (1) international transmission facilities; (2) international switching facilities; and (3) costs associated with the local distribution (or "national extension") of calls within the country. The methods we use to compute the price for each element are discussed below.

A. International Transmission Facility Tariffed Component Prices

³ The countries that fall into this category are Argentina, Kenya, Nicaragua, and Uruguay. For Argentina, we use the tariff rate for a 512 Kbps circuit. For the others, we use tariff rates for a 128 Kbps circuit.

⁴ See ITU-T Recommendation D.300R, *Recommendations for Regional Application, "Determination of accounting rate shares in telephone relations between countries in Europe and the Mediterranean Basin,"* Geneva (1995).

Many carriers offer international private line service to their customers using high capacity circuits. Typically, these are 1.5 or 2.0 Mbps circuits. These circuits are functionally equivalent to the dedicated circuits used by carriers to provide IMTS. For international telephony, carriers use high capacity circuits (*e.g.*, 1.5 or 2.0 Mbps facilities) to interconnect with U.S. facilities-based carriers. We therefore use the rates charged by carriers for dedicated private line service to calculate a TCP for the international transmission component.⁵ If a carrier offers private line service to its customers using high-speed digital facilities, we use the rate charged for that service. If a carrier offers private line service using slower speed facilities, we use the tariff rate charge for that service to calculate the TCP for the international transmission component. Some carriers offer multi-year service options at reduced rates to their customers. Others offer reductions from their tariff rates to customers with large billings. We reflect these options where applicable in our calculations. The tariff rates we use to calculate the international transmission component, including the service bandwidth and time period, are shown in Attachment C.

To calculate a TCP for the international transmission component of a carrier's settlement rate, we must convert the monthly private line rates to a charge per minute. We do this by first calculating the number of voice grade circuits that are derived from a private line half-channel. A 2.048 Mbps half-channel is comprised of thirty 64 Kbps circuits.⁶ Each 64 Kbps circuit can be multiplexed to produce voice grade circuits capable of completing switched international calls. Digitalization capabilities enable carriers to derive a range of voice grade circuits from a 64 Kbps half-channel. Typically, U.S. facilities-based carriers derive about four voice grade circuits from a 64 Kbps half-channel for IMTS, although substantially more circuits are possible.⁷ Because the general practice among U.S. carriers is to derive four voice grade circuits from a 64 Kbps half-channel, we use a multiplication factor of 4:1 to calculate the number of voice grade circuits derived from a private line half-channel. Using a multiplication factor of 4:1, we find that 120 equivalent voice grade circuits can be derived from a 2.048 Mbps half-channel.

⁵ As noted, the carriers in Guyana and Haiti do not publish their tariffs for international dedicated service. They do, however, offer the service at rates that are negotiated but not disclosed. In order to include these countries in the study, we used the highest available tariff for comparable service in the respective region as a proxy for these countries' unpublished data. For service with Guyana, we used the tariff for 2.048 Mbps service in Brazil. For service with Haiti, we used the tariff for 1.544 Mbps service in Barbados.

⁶ A 1.544 Mbps half-channel is comprised of twenty-four 64 Kbps circuits, a 512 Kbps half-channel is comprised of eight 64 Kbps circuits, and a 128 Kbps half-channel is comprised of two 64 Kbps circuits.

⁷ Many multiplication factors are used to provide IMTS with the advent of digitalization of international circuits in the late 1980's. In the reseller market, for example, 5:1 or 6:1 multiplication factors are common, and figures of 8:1 or 10:1 have been reported. U.S. facilities-based carriers generally derive about four voice grade circuits from a half channel for IMTS with foreign carriers. Other things being equal, the cost per minute for the international transmission component is inversely related to the multiplexing ratio that is used. In other words, as the number of circuit per half channel increases, the cost per minute decreases.

We next estimate the rate per minute for the voice grade circuits using monthly minutes transmitted over a circuit. Monthly minutes transmitted over international circuits vary from country to country, from carrier to carrier, and from month to month. Recent operating experience of U.S. facilities-based carriers suggests that about 8,000 minutes of voice traffic per circuit per month represents a reliable and reasonable usage level for the countries included in the study. This figure represents a usage level of less than twenty percent and, therefore, may be a bit conservative. It suggests that significantly higher levels of usage can be transmitted over international circuits. Nonetheless, to be conservative in our estimates, we use a usage level of 8,000 minutes per month to convert the private line rates to a per minute charge.

We present here two examples to demonstrate how we use carriers' private line tariffs to calculate the TCP for the international transmission component.

Example 1. France. International private line service offered by France Telecom provides an example involving an E1 circuit (2.048 Mbps). France Telecom's monthly tariff rate for an E1 circuit with a lease period of five years for service to the United States is 167,300 French Francs (FF). France Telecom offers a 15 percent discount to customers with a monthly billing of more than 300,000 FF. Because U.S. facilities-based carriers generate monthly bills that exceed 300,000 FF, they are entitled to the discount. Allowing for the 15 percent discount in France Telecom's tariff rate reduces the monthly charge to 142,205 FF per circuit, at an exchange rate of US\$ 1.00=5.16 FF. With thirty 64 Kbps circuits to an E1 half-channel, a multiplication factor of 4:1, and a usage level of 8,000 minutes per circuit per month, 960,000 minutes are transmitted over an E1 half-channel in an average month. Thus, France Telecom's monthly tariff rate, after the discount, is equal to an average charge of \$0.029 per minute for the international transmission facility component for service from the United States to France.

Example 2. Uruguay. Uruguay provides an example of the procedure used in the study to estimate the international transmission facility component for flat rate private line service transmitted over a circuit with lower bandwidth than an E1 half-channel (*i.e.*, there is no reduction from the tariff rate for a multi-year lease and no discount for large volume customers). Service is offered with a 128 Kbps half-channel. ANTEL's tariff rate for this service, at an exchange rate of US\$ 1.00=New Pesos 7.53, is \$8,131 per month. There are no adjustments in this rate. With two 64 Kbps circuits to a half-channel, a multiplication factor of 4:1, and a usage level of 8,000 minutes per circuit per month, 64,000 minutes are transmitted over a half-channel in an average month. Thus, ANTEL's monthly tariff rate is equivalent to an average charge of \$0.127 per minute for the international transmission facility component for service between the United States and Uruguay.

A summary of the international transmission TCP is presented in Table 2 and included in Attachment B.

Table 2. International Transmission Tariffed Component Prices
(per minute)

<u>Country</u>	<u>TCP</u>	<u>Country</u>	<u>TCP</u>
Argentina	6.7¢	Jordan	15.9¢
Australia	4.8¢	Kenya	25.5¢
Austria	8.1¢	Korea	5.1¢
Bahamas	5.2¢	Kuwait	7.1¢
Barbados	8.6¢	Malaysia	6.6¢
Belgium	3.0¢	Mexico	0.9¢
Bermuda	4.5¢	Netherlands	2.6¢
Brazil	6.6¢	New Zealand	5.7¢
Chile	2.9¢	Nicaragua	3.8¢
Colombia	5.1¢	Norway	3.2¢
Costa Rica	3.3¢	P.R. of China	8.7¢
Czech Republic	8.1¢	Pakistan	14.7¢
Denmark	5.9¢	Panama	4.7¢
Dominican Rep.	3.6¢	Peru	5.8¢
Ecuador	2.9¢	Philippines	6.5¢
Egypt	10.4¢	Poland	4.7¢
El Salvador	5.9¢	Portugal	4.6¢
France	2.9¢	Russia	5.4¢
Germany	4.3¢	Singapore	5.0¢
Greece	5.2¢	South Africa	5.2¢
Guatemala	3.1¢	Spain	4.8¢
Guyana	6.6¢	Sweden	3.6¢
Haiti	8.6¢	Switzerland	4.4¢
Honduras	3.1¢	Taiwan	5.7¢
Hong Kong	5.1¢	Thailand	4.0¢
Hungary	6.1¢	Trinidad	3.6¢
India	8.1¢	Turkey	5.4¢
Indonesia	6.8¢	U.A.E.	3.3¢
Ireland	2.7¢	United Kingdom	2.4¢
Israel	4.2¢	Uruguay	12.7¢
Italy	4.8¢	Venezuela	3.7¢
Jamaica	2.9¢	Vietnam	9.3¢
Japan	6.5¢		

B. International Switching Facility Tariffed Component Prices

There is little information in the public domain concerning the international switching facility component. Carriers in Sweden and the United Kingdom have termination tariffs which could serve as a reference point for international switching costs incurred by a correspondent but these arrangements may not be representative of other countries in the study.⁸ In other cases, developing a reasonable estimate is a complex procedure because a correspondent's switch is often used for domestic service, both local and long distance calls, and for international service, both originating and terminating calls. Thus, even if relevant information is available, potentially complex cost allocation and relative usage problems would need to be addressed in order to develop separate estimates for the international switching facility component.

⁸ Telia, the domestic carrier in Sweden, has an interconnect tariff which allows competing international carriers to interconnect with its domestic network. The tariff has two components: a monthly connection point charge of approximately \$6,000, and fixed monthly charge of approximately \$73 per facility, e.g., 2.048 Mbps circuit. These fixed charges are equivalent to a monthly rate of \$0.003 per minute for usage of 8,000 minutes per circuit.

Fortunately, the ITU-T has published information used by TEUREM member countries⁹ for telephone settlements among them.¹⁰ These countries base settlements on accounting rate shares for each of the three network elements identified in ITU-T Recommendation D.140: international transmission, international exchange, and national extension. The accounting rate shares for each network element, which are denominated in SDRs, vary with the proportion of plant capacity composed of digital equipment relative to total plant capacity. The accounting rate share declines as the digitalization capability rises to reflect the greater efficiency of digital equipment. The digitalization categories are: (1) 0-30%, (2) 31-60%, and (3) 61-100%. To determine settlements for the international exchange component, TEUREM countries use an accounting rate share of 0.0324 SDR (about \$0.048) for the first category, 0.0228 SDR (about \$0.034) for the second category, and 0.129 SDR (about \$0.019) for the third category. Using these digitalization categories, TEUREM countries calculate accounting rate share figures from data filed by the member countries.

We use the accounting rate share information published in ITU-T Recommendation D.300R to calculate the TCP for the international transmission component. However, we must devise a basis for assigning digitalization categories to countries, as the results presented in ITU-T Recommendation D.300R do not list the countries that fall into each digitalization category. Generally, telecommunications networks in developing countries are less technologically advanced and, therefore, have lower levels of digital equipment than those in industrialized countries. We therefore use TEUREM's highest accounting rate share figure for the international exchange component, 0.0324 SDR, to estimate the TCP for the international switching component for the least developed countries in the study. We use the lowest figure, 0.0129 SDR, for the most developed countries, and the middle figure, 0.0228, for other countries.

For purposes of assigning digitalization categories to countries, we classify countries according to their level of economic development. We use the World Bank's classification scheme,¹¹ which is also used by the ITU.¹² This classification scheme has four categories:

⁹ ITU-T Recommendation D.300R. *See supra*, n.4. An exchange rate 1.0 SDR = \$1.48 is used to convert the TEUREM figures to U.S. dollar figures.

¹⁰ The TEUREM results are based on analyses of operating results conducted by a range of member carriers that provide service in industrialized and developing countries. The TEUREM group are: Albania, Algeria, Andorra, Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Egypt, Finland, France, Gibraltar, Germany, Greece, Greenland, Hungary, Ireland, Israel, Italy, Lebanon, Libya, Liechtenstein, Luxembourg, Malta, Monaco, Morocco, Netherlands, Norway, Poland, Romania, San Marino, Spain, Sweden, Switzerland, Syria, Tunisia, Turkey, United Kingdom, Russia, Vatican City State, and Yugoslavia.

¹¹ *See Social Indicators of Development*, World Bank, Washington, D.C. (1996).

¹² *See World Telecommunication Indicators 1994/1995*, International Telecommunication Union, Geneva (1995).

- low income, GNP per capita of \$726 or less;
- lower middle income, GNP per capita between \$726 and \$2,895;
- upper middle income, GNP per capita between \$2,896 and 8,955; and
- high income, GNP per capita greater than \$8,955.

Table 3 lists the countries in the study by their level of economic development.

Table 3. Economic Development Classification

<u>Low</u>	<u>Lower Middle</u>	<u>Upper Middle</u>	<u>High</u>
Egypt	Colombia	Argentina	Australia
Guyana	Costa Rica	Barbados	Austria
Haiti	Dominican Rep.	Brazil	Bahamas
Honduras	Ecuador	Chile	Belgium
India	El Salvador	Czech Republic	Bermuda
Kenya	Guatemala	Greece	Denmark
Nicaragua	Indonesia	Hungary	France
P.R. China	Jamaica	Korea, Rep.	Germany
Pakistan	Jordan	Malaysia	Hong Kong
Vietnam	Panama	Mexico	Ireland
	Peru	South Africa	Israel
	Philippines	Trinidad & Tobago	Italy
	Poland	Uruguay	Japan
	Russian Fed.		Kuwait
	Thailand		Netherlands
	Turkey		New Zealand
	Venezuela		Norway
			Portugal
			Singapore
			Spain
			Sweden
			Switzerland
			Taiwan
			U.A.E.
			United Kingdom

A summary of the international switched facilities TCP is presented in Table 4 and included in Attachment B.

Table 4. International Switched Facilities Tariffed Component Prices
(per minute)

<u>Country</u>	<u>TCP</u>	<u>Country</u>	<u>TCP</u>
Argentina	3.4¢	Jordan	4.8¢
Australia	1.9¢	Kenya	4.8¢
Austria	1.9¢	Korea	3.4¢
Bahamas	1.9¢	Kuwait	1.9¢
Barbados	3.4¢	Malaysia	3.4¢
Belgium	1.9¢	Mexico	3.4¢
Bermuda	1.9¢	Netherlands	1.9¢
Brazil	3.4¢	New Zealand	1.9¢
Chile	3.4¢	Nicaragua	4.8¢
Colombia	4.8¢	Norway	1.9¢
Costa Rica	4.8¢	P.R. of China	4.8¢
Czech Republic	3.4¢	Pakistan	4.8¢
Denmark	1.9¢	Panama	4.8¢
Dominican Rep.	4.8¢	Peru	4.8¢
Ecuador	4.8¢	Philippines	4.8¢
Egypt	4.8¢	Poland	4.8¢
El Salvador	4.8¢	Portugal	1.9¢
France	1.9¢	Russian Fed.	4.8¢
Germany	1.9¢	Singapore	1.9¢
Greece	3.4¢	South Africa	3.4¢
Guatemala	4.8¢	Spain	1.9¢
Guyana	4.8¢	Sweden	1.9¢
Haiti	4.8¢	Switzerland	1.9¢
Honduras	4.8¢	Taiwan	1.9¢
Hong Kong	1.9¢	Thailand	4.8¢
Hungary	3.4¢	Trinidad	3.4¢
India	4.8¢	Turkey	4.8¢
Indonesia	4.8¢	U.A.E.	1.9¢
Ireland	1.9¢	United Kingdom	1.9¢
Israel	1.9¢	Uruguay	3.4¢
Italy	1.9¢	Venezuela	4.8¢
Jamaica	4.8¢	Vietnam	4.8¢
Japan	1.9¢		

C. National Extension Tariffed Component Prices

The calculation of the TCP for the national extension component requires several steps. The first step is to determine the distribution of international calls from the United States within each country included in the study. The distribution categories vary with the tariff rate classifications for local and toll service within each country. The categories could include time of day, day of the week, mileage, etc., depending upon the carrier's tariff schedule. We distribute international calls from the United States among service classifications, time periods, and the destination of the calls using information collected on customers' calls during a three month period that began on January 6, 1996.¹³ In many countries, most calls from the United States terminate in major metropolitan areas. In many cases, more than 70 percent of the calls fall into this category. Tariff rates for service in metropolitan areas are generally significantly lower than those

¹³ Call distribution information was collected for AT&T's network. The data collected during the sampling period was made available on the record by AT&T on a confidential basis. *See Order Granting Motion for Confidential Treatment*, IB Docket No. 96-261, DA-97-1563 (rel. July 23, 1997).

for calls to remote areas. In Argentina, for example, calls within Buenos Aires have a rate during the normal period of \$0.021 per minute as compared to \$1.418 per minute for a call transmitted beyond 600 kilometers.

The second step in developing an estimate for the national extension TCP is to determine the distance from the foreign international exchange switch through which the calls pass en route to their final destination. This determination is necessary because domestic rates in many countries included in the sample vary with distance.

The third step of the estimation process is to select the appropriate tariff rate to use for the minutes in each distribution category. We use the lowest rate offered by a carrier for each of its different tariff elements. In those cases where a carrier offers a discount available for large volumes of domestic service, the discount is used to calculate the estimates. In Japan, for example, NTT offers volume discounts ranging from 5 to 25 percent, which are reflected in the estimates of the national extension component for Japan. We present a complete list of the national tariffs we use to calculate the national extension component in Attachment D.

The final step is to develop a country's national extension TCP. We derive the TCP from the information about the distribution of international calls from the United States among tariff rate categories, the destination points within a country, and the distance from a country's international gateway switch or switches. The result is a figure that is weighted by each country's distribution of minutes from the United States among service and tariff rate categories, the particular domestic telephone service tariff schedule, and the distribution of calls throughout the country.

We present here two examples to demonstrate how we use carriers' national tariffs to calculate the TCP for the international transmission component.

Example 1. Argentina. Argentina presents an uncomplicated example of the process used to estimate a national extension component. Call distribution information for service from the United States to this country shows that 80 percent of U.S. service terminates in the Buenos Aires area. The local domestic charge for minutes in this area is \$0.021 per minute. There are ten mileage rate bands in Argentina but only a small amount of international traffic from the United States terminates in each rate band. In order to simplify the estimation process without a significant loss in accuracy, the minutes terminating outside the area of Buenos Aires are combined into two categories and the highest rate for each category is used. Thus, all minutes that terminated in mileage rate bands 2 through 6 are combined and the tariff rates for rate band 6 (as shown in Attachment D) are used for these minutes. Similarly, all minutes terminating in mileage rate bands 7 through 10 are combined and the tariff rates for rate band 10 (as shown in Attachment D) are used in the calculation. The result is an estimated national extension TCP of \$0.22 per minute for Argentina.

Example 2. India. India has a complicated tariff rate schedule for service within the country and international service from the United States is more widely distributed throughout the country than is the case with Argentina. These two features of service with India add to the difficulty in estimating the national extension TCP. In addition, there are four international gateway switches that serve the entire country. This last factor means that, in order to estimate India's national extension TCP, it is necessary to locate each city calling code in relation to the nearest gateway switch. We plot the seven mileage rate bands for domestic service in India around each international gateway switch and assign the appropriate city calling code to the proper rate band based on the distance from the nearest gateway switch. We determine the percentage of traffic in each rate band by combining the appropriate city code and international gateway switch. We group international traffic from the United States by the seven mileage rate bands with time-of-day weighted prices. The resulting rates range from \$0.02 per minute to \$0.789 per minute. Finally, we weight the weighted rates for each mileage rate band by the percentage of U.S. traffic terminating in the rate band. The resulting estimated national extension TCP for India is \$0.183.

A summary of the national extension TCPs for all countries is presented in Table 5 and included in Attachment B.

Table 5. National Extension Tariffed Component Prices
(per minute)

<u>Country</u>	<u>TCP</u>	<u>Country</u>	<u>TCP</u>
Argentina	22.0¢	Jordan	2.3¢
Australia	12.0¢	Kenya	12.3¢
Austria	21.4¢	Korea	4.3¢
Bahamas	12.8¢	Kuwait	Zero
Barbados	Zero	Malaysia	12.4¢
Belgium	9.2¢	Mexico	12.5¢
Bermuda	3.5¢	Netherlands	5.3¢
Brazil	17.8¢	New Zealand	16.2¢
Chile	12.3¢	Nicaragua	3.7¢
Colombia	8.6¢	Norway	6.5¢
Costa Rica	2.2¢	P.R. of China	4.2¢
Czech Republic	7.5¢	Pakistan	7.2¢
Denmark	6.6¢	Panama	9.9¢
Dominican Rep.	6.1¢	Peru	5.5¢
Ecuador	2.6¢	Philippines	12.6¢
Egypt	2.0¢	Poland	15.1¢
El Salvador	1.1¢	Portugal	17.4¢
France	12.7¢	Russia	25.2¢
Germany	13.6¢	Singapore	\$0.7¢
Greece	14.4¢	South Africa	8.3¢
Guatemala	2.4¢	Spain	11.4¢
Guyana	0.6¢	Sweden	4.5¢
Haiti	17.0¢	Switzerland	14.3¢
Honduras	8.7¢	Taiwan	6.3¢
Hong Kong	Zero	Thailand	8.3¢
Hungary	4.9¢	Trinidad	7.6¢
India	18.3¢	Turkey	7.7¢
Indonesia	23.9¢	U.A.E.	2.5¢
Ireland	13.4¢	United Kingdom	8.7¢
Israel	2.4¢	Uruguay	6.2¢
Italy	11.5¢	Venezuela	15.3¢
Jamaica	1.0¢	Vietnam	10.6¢
Japan	11.3¢		

V. Summary

In the absence of information about foreign carriers' costs of terminating international traffic, we must look to alternative sources of information to calculate settlement rate benchmarks. In this *Order*, we adopt the tariffed components price, or TCP methodology, to calculate settlement rate benchmarks. As described in detail in this Appendix, the TCP methodology uses foreign carriers' tariff rates that correspond to the network elements of the structural framework adopted by the ITU-T in Recommendation D.140 and information published by the ITU to calculate benchmarks.