Chapter 4
Financial Agreements for Jointly Provided International Services*

Robert E. Dansby
Thomas R. Luciano

INTRODUCTION

The purpose of this chapter is to discuss changes in the market for international voice telecommunications that are having substantial influence on pricing and settlements policies. Traditional international monopoly markets are evolving into competitive ones. In response to customer needs, vendors that once offered a single class of service have begun to offer multiple services with several pricing options. These market-driven changes in the international telecommunications market imply that service providers and regulatory authorities must re-assess their policies regarding accounting rates. The view that prices should conform to accounting rates must be replaced by the philosophy that accounting rates must reflect the underlying cost structure. The view that accounting rates are somewhat static must be replaced by a willingness to change accounting rates in response to relevant market factors. These considerations lead us to focus on specific options whose implementation would improve the structure of accounting rates.

International accounting rate practices are discussed in the first section. In the next section properties of efficient and incentive compatible settlement rates are derived. Practical impediments to the implementation of efficient accounting rates are discussed in the section after that, and suggestions are made for a "reasoned" movement toward incentive compatible and efficient accounting rates. The latter two sections also give insights regarding the implementation of time of day collection and accounting rates. The final section gives a summary of principle conclusions.

INTERNATIONAL ACCOUNTING RATE PRACTICES

Since international calls use jointly owned equipment and facilities of at least two countries, some equitable methods must be negotiated to compensate the partners fairly for the value each adds to the partnership. International service is provisioned on a partnership basis between two administrations. Each shares the risk and provides half the investment. But because revenue from jointly provided service may not be billed in equal shares by the administrations, a form of revenue sharing through an accounting rate process has been established. Accounting rates can serve this role to the extent that they result in a fair two-way division of revenue between the partners. The United States is represented in accounting agreements with over 200 countries. Responsibility for transmission of U.S. telecommunications traffic resides with private voice and record carriers. Each of these has its own arrangements for settling international traffic, although the FCC's Uniform Settlement Rates Policy on parallel routes constrains the freedom of the International Record Carriers (IRCs) to reach separate accounting rates with their correspondents without obtaining an explicit waiver from the Federal Communications Commission. In general, the policy requires an "equal division" of the accounting rate between the U.S. carrier and the foreign administration. It also specifies that each carrier must use the same accounting rates for like services on parallel routes. Although some competition has emerged for voice traffic from the U.S. to other international points, the FCC has determined that the Uniform Settlements Rates Policy also applies to voice carriers.

For every minute of calling, an administration or carrier collects a charge from its customers called the *collection rate*. The sum of all charges to its customers is called *total billed revenue* (TBR). While most of this revenue comes from domestic originating international calls (i.e., *sent paid* messages), additional monies are derived from

calls which are *received collect*. The accounting rate is a mutually negotiated value for a minute of calling between two countries, to be divided equally between the parties. If two countries have equal collection charges, the accounting rate would normally be set at the same level. In general, the collection rate of the respective countries are not equal. In such cases an accounting rate is usually chosen which falls somewhere between the two collection charges.

By convention and by international agreement the settlement rate, which equals one-half the accounting rate, denotes one correspondent's share of revenue for a predetermined measure of usage, generally a minute. A correspondent's retained revenue equals collected revenue minus net settlements, which in turn is defined by the relationship:

(Collection rate minus Settlement rate) * (Outbound Minutes)
Plus
(Settlement rate) * (Inbound minutes).

This represents a correspondent's share of the two-way traffic revenue stream that results from the joint provision of international telephone service. The net financial impact on an administration of the settlements process is determined by the accounting rate and the ratio of outbound to inbound traffic. Obviously, these factors and their rates of growth are very important in the bilateral negotiation of the terms and conditions of international joint agreements. The accounting rate is the critical component of these agreements. Its value is determined bilaterally by assessing the key variables in provisioning two-way service, i.e., price, two-way traffic flows, costs, growth rates, volumes, diversification, transit considerations, and competitive alternatives.

EFFICIENT AND INCENTIVE COMPATIBLE ACCOUNTING RATES

In order to better serve customer needs, it is important that international carriers implement market driven pricing strategies. This applies both to domestic and international collection rates as well as international accounting rates. Many considerations are involved in the determination of appropriate market driven prices. We focus on two fundamental considerations that influence the character of market-driven accounting rates: (a) incentive compatibility and (b) marginal-cost-based prices. Incentive compatibility refers to the principle that both parties to an international interlinking agreement should

find the terms and conditions of such agreements "satisfactory." The negotiation process should allow both parties to influence the final terms and conditions in such a way that both parties (a) have an incentive to adhere to the terms of the joint agreement without need for monitoring, and (b) are better off when the joint agreement is implemented. The economic properties of such accounting rates are discussed in the following section.

Marginal-cost-based prices (or incremental cost pricing) have been recognized in the public utility industry as the preferred pricing philosophy. In the international arena, the application of this philosophy means that collection rates must reflect underlying costs, and accounting rates should parallel collection rates. The structure of international traffic patterns implies that both collection rates and accounting rates should embody a peak/off-peak price structure. Aspects of a peak load structure for international rates are also discussed below.

Bilateral Contracts for International Services

In this section we analyze a bilateral model of international accounting rate negotiation which embodies elements of noncooperative and cooperative strategic decision making. The results discussed in this section summarize the principle results, as applied to international telecommunications agreements, of Dansby (1987).*

Basic Assumptions of Model

We assume that each international carrier chooses its collection rates independently. Accounting rates are jointly negotiated in discussions between two international carriers. We assume there are two firms, which respectively face demand curves $Q_i(p_i)$, $i = 1,2$. The firms are further distinguished by differences in their production technologies. In order to supply international calls to its domestic customers, the domestic carrier must use its own facilities and must rely on its foreign correspondent to employ its production facilities to complete each international call.

Suppose each international carrier knows the overall demand Q_i for its domestic originating calls. However, each firm is uncertain of the proportion, a_i, of calls with a foreign destination. Thus, each firm is uncertain about the level of demand that will require use of its

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* This paper is a general economic analysis of incentive compatible joint production contracts.

facilities and the production facilities of its foreign correspondent. We assume that firms know the distribution of (a_1, a_2); the joint distribution of these random parameters is $f(a_1, a_2)$. Firm i observes the parameter a_i but does not observe realizations of the parameter $a_j, j \neq i$. It is also assumed that neither firm can observe the other's aggregate demand. This structure is a fair representation of the international telecommunications demand environment.

Firm i's cost of production is denoted C_i. We assume that C_i has three arguments. The first is the total quantity, Q_{ii}, of domestic calls, calls that originate and terminate in country i. The second is the quantity, Q_{ij}, of outbound traffic, international calls that originate in country i and terminate in country j. The third is the quantity of inbound traffic, international calls originating in country j and terminating in country i; Q_{ji}. Thus the cost function for firm i is:

$$C_i(Q_{ii}, Q_{ij}, Q_{ji}) =$$
Cost (Domestic Orig. Calls, Outbound Calls, Inbound Calls).

The total output produced, and the total production cost incurred by each firm, will depend on the arrangements made to gain access to facilities needed to complete international calls. The focus of this discussion is the use of negotiated production agreements as a mechanism for consummating joint production. If the firms do not enter into a joint production agreement and have access only to their own domestic production facilities, then each will only be able to accommodate $(1-a_i)$ percent of its total demand. Hence, in the absence of a joint production agreement, the firms will earn profits given by

$$\pi_i = [(1)\text{-}(a_i)P_iQ_i] - [C_i((1-a_i)Q_i,0,0)].$$

In this case firm i's optimal pricing strategy is a contingent price schedule, which maximizes profit in each state a_i:

$$P_i^*(a_i) = [C_i(1-a_i)Q_i,0,0) / Q_{ii}] * [E_i / (E_i - 1)]$$

where E_i is the price elasticity of demand.

If firm i implements its optimal contingent price schedule, then its profits will be a nonincreasing function of a_i. If the demand Q_i is perfectly elastic, the optimal profits are unaffected by changes in the proportion of international calls. If the market is not purely competitive, then optimal profits will decrease as the proportion of international calls increase. Therefore, firm i has greater incentive to secure access to the correspondent's facilities as realizations of high values of a_i become more likely.

Though realizations of a_j do not directly affect the profits π_i^* of firm i, absent a joint production agreement, a_j does influence firm i's incentive to enter into a joint agreement. If Q_j is not perfectly elastic, then firm j suffers declining profits as a_j increases. Thus, firm j's optimal profit using the contingent price schedule and only its own production facilities will be small if large values of a_j are realized. To this extent a_j affects firm i's incentive to enter a joint production agreement; firm i will be in a stronger bargaining position if large values of a_j are more likely.

Moreover, the bargaining power of an administration is influenced by the ratio of its outbound to domestic traffic. The incentives of international carriers to enter a joint production agreement are better understood by an examination of their profits in that regime. Let π_i denote the profits of firm i when it operates under a joint agreement. The joint production agreement is a contract specifying that each carrier makes an irrevocable commitment to cooperate in the joint completion of international calls that originate (terminate) in the respective countries. The joint production agreement provides that firm i will supply facilities and service to complete inbound calls, Q_{ji}, and will gain access to its correspondent's facilities and service to complete Q_{ij} of its outbound international calls. The joint production agreement also establishes a set of accounting/settlement rates. Without loss of generality, we let T_i denote firm i's net payments. The net payments of firm i are assumed to depend on the level of outbound and inbound calls, i.e., $T_i = T_i(Q_{ij}, Q_{ji})$. If firm i's collection rate is P_i then profits from its international operations will be

$$\pi_i = P_i Q_i(P_i) - C_i(Q_{ii}, Q_{ij}, Q_{ji}) - T_i(Q_{ij}, Q_{ji})$$

when the joint production agreement is operative.

Contract Negotiation

The firms have an interest in negotiating the terms of the joint production agreement so as to be incentive compatible. The process by which contract terms are negotiated must reflect each firm's independent discretion in the choice of their respective collection rates. Therefore, we assume the negotiation process has two stages. In the first stage each firm independently selects an optimal contingent price schedule assuming a given value of its potential correspondent's outbound calls. This calculation yields an optimal payoff function and price reaction function for each specification of the contract's terms. In the second stage, this data is used as the basis for bargaining on contract terms.

Thus, if the market demand for firm i is perfectly elastic, its optimal contingent pricing schedule would set its collection rate equal to the marginal cost of producing its own output, plus the marginal net payments made under the joint production agreement. Price would be set above marginal total cost if demand is not perfectly elastic. The deviation of price from marginal total cost is influenced by the proportion of inbound to outbound calls. More precisely, the optimal collection rate P_t^* equals the elasticity factor $E_t / (E_t - 1)$ times: (a) the marginal cost of total domestic originating calls, plus (b) the proportion of outbound calls times the marginal net cost of international calls.

Optimal collection rates are intrinsically related to, and dependent on, marginal (incremental) accounting rates. When the optimal contingent prices P_t^* are substituted into the profit functions π_i, we obtain, for each firm, a function that describes its "best" payoff if the contract terms are T_i. The best response payoff functions are the basis for negotiation in the second stage. Each firm enters this second stage knowing the greatest profits, π_i^*, it can achieve for various inbound and outbound call levels and for any proposed net payment schedule. Negotiations in the second stage will result in the specification of a net payment schedule, T_i.

Bilateral Accounting Rates

A general characterization of the incentive compatible net payment schedule is that the marginal settlement rate for outbound calls, plus the marginal settlement rate for inbound calls, must be equal to the marginal cost of firm j's outbound calls minus the marginal cost of firm i's outbound calls. This relationship arises because optimal accounting rates impact optimal collection rates, which in turn are based on marginal cost. Hence, if the marginal cost of the joint output Q_{ij} is constant for both firms, then the joint production agreement is incentive compatible if and only if the net payment (settlement) schedule is given by

$$T_i(Q_{ij}, Q_{ji}) = \{[\partial C_j/\partial Q_{ji}]^* Q_{ji}\} - \{[\partial C_i/\partial Q_{ij}]^* Q_{ij}\}.$$

When incentive compatible accounting rates are employed, collection rates will have the least deviation from marginal production cost and will be efficient. Another important property of incentive compatible net payment schedules is that there exists an incentive compatible joint production agreement only if the total marginal cost of outbound calls is invariant to changes in the level of inbound calls. Hence, incentive compatible contract terms are always achievable if both

firms have strictly linear cost functions. However, incentive-compatible joint production agreements may not exist if both firms have production technologies that exhibit economies of scope or weak production complementaries in the joint production of inbound and outbound calls.

A Basic Model of Peak Load Prices for the Overseas Market

This section discusses a generalization of the Boiteux-Steiner Model of Peak Load Pricing, which incorporates the principal aspects of the overseas telecommunications market. This is a summary of results in Dansby (1983). The principal considerations relevant to developing peak load prices for the overseas market may be summarized as follows:

1. Capacity decisions regarding certain components of the overseas network are made exogenous to the domestic pricing process, and several types of capacity, with different cost characteristics, are used to provide service;
2. Prices may have an asymmetric impact on domestic and foreign originating demands;
3. Revenues must be divided according to a separations formula that affects pricing incentives; and
4. Profits from the service must satisfy regulatory constraints.

The traditional peak load pricing literature provides guidance concerning some of these considerations, but not all. Consequently, Dansby (1983) generalized the traditional peak load models in order to prescribe optimal peak load prices for the overseas market. This section describes the simplest model that incorporates these considerations and analyzes their impact on the optimal peak load prices. The simplest model is one of bilateral trade between two regions. In this basic model, we first examine the impact of foreign demands and the settlements process on optimal peak load prices.

Suppose that q_j and q_j^f are respectively the U.S. originating and foreign originating demands in period j between the U.S. and the foreign region. Let P_j and P_j^f respectively denote the marginal price per call in period j for calls between the U.S. and the foreign region. It is assumed that q_j and q_j^f depend on P_j and P_j^f. However, in keeping with the Boiteux-Steiner framework, the cross elasticities of demand q_j and Q_j^f with respect to prices in other periods are assumed to equal zero.

For a single bilateral market, with two pricing periods, the public utility's profit from trade with a foreign correspondent during the two periods is

$$\pi = [P_1 - b]q_1 + [P_2 - b]q_2 - b[q_1^f + q_2^f]$$
$$- [T][(q_1 + q_2) - (q_1^f + q_2^f)] - BK.$$

Here we assume that the settlement rate for calls to the foreign region is a uniform rate T. Thus, the quantity $[T][(q_1 + q_2) - (q_1^f + q_2^f)]$ is the net settlement that must be paid to the communication concern of the foreign region, since $[T][q_1^f + q_2^f]$ is received from the region and $[T][q_1 + q_2]$ must be paid to them. The domestic public utility incurs an operating cost $b[q_1^f + q_2^f]$ when serving the foreign originating demands. It is assumed that B is the marginal capital (capacity) cost of the domestic public utility; B includes the marginal cost of both cable and switching capacity, since these facilities are assumed to be expanded in fixed proportion. Any costs associated with the transmission of overseas calls through the domestic network are assumed to be included in the marginal operating cost.

The optimal peak load prices and capacity of the overseas carrier are assumed to maximize welfare, which equals profit plus consumer surplus subject to a constraint that demand not exceed capacity. Using standard methods, it is found that the optimal peak load prices and capacity are characterized by:

$$P_1^* = [b + B + T] + \{[b + B\text{-}T]^*[(\partial q_1^f/\partial P_1) / (\partial q_1/\partial P_1)]\};$$
$$P_2^* = [b + T] + \{[b\text{-}T]^*[(\partial q_2^f/\partial P_2) / (\partial q_2/\partial P_2)]\}; \text{ and}$$
$$K^* = q_1 (P_1^*, P_2) + q_2^f(P_1, P_2^*)$$

where period 1 is taken to be the peak period.

These results show that the optimal peak period price depends on marginal operating and capacity cost but also on the accounting rate and the relative elasticities of foreign and domestic originating demands, i.e., the ratio R_j of $\partial q_j^f/\partial P_j$ to $\partial q_j/\partial P_j$. This ratio appears in the pricing formula because it gauges the impact of a price change on total traffic in a particular period. A price increase will cause total usage in a period to: (a) decrease if the ratio is greater than minus one; (b) remain unchanged, though the percentage of foreign originating demand increases, if the ratio equals minus one; and (c) increase if the ratio is less than minus one. Therefore, the ratio R_j reflects the adjustments in prices that must be made in response to foreign originating demands. The optimal peak and off-peak prices depend in the same way on the accounting rate; i.e., both prices are functions of $[T] (1 - R_j)$, $j = 1,2$. This quantity may be viewed as the price adjustment induced by the settlements process. Hence, a lower accounting rate: (a) leads to lower optimal collection rates if $R_j < 1$, (b) leads to higher optimal collection rates if $R_j > 1$, and (c) has no impact on the optimal collection rates if $R_j = 1$. In the case being considered,

the incentive compatible accounting rate would equal: (a) marginal operating cost in the off-peak period, and (b) marginal operating plus marginal capacity cost in the peak period.

If marginal production costs are constant, then incentive-compatible accounting rates will have a peak/off-peak structure, and the associated peak/off-peak collection rates will be efficient in the Boiteux Steiner sense. Consequently, when settlement rates are not incentive compatible, the optimal peak and off-peak prices may be significantly different from the Boiteux-Steiner prices. The optimal prices for this simple bilateral trade model are equal to the Boiteux-Steiner prices if and only if $T + [b+B-T]R_1 = 0$ in the peak period and $T + [b\text{-}T]R_2 = 0$ *in the off-peak period; this implies that the prices are equal only if* $b/(b+B) = (R_2 - 1)/(R_1 - 1)$. However, the optimal capacity level satisfies the Boiteux-Steiner rule that capacity be equal to demand in the peak period.

To illustrate the potential magnitude of the price differences, we consider some special cases. Suppose that any U.S. price change has no effect on total usage in either period, i.e., $R_j = -1$ for $j = 1,2$. Then the optimal peak and off-peak prices are, respectively, $P_1^* = T$ and $P_2^* = T$. Hence, if prices do not affect total inbound plus outbound usage, even though price increases may reduce U.S. originating demands in each period, the optimal pricing strategy is to charge the accounting rate. If the foreign originating demands are unaffected by U.S. prices, then the optimal peak and off-peak prices equal the Boiteux-Steiner prices plus the accounting rate; i.e., if $R_j = 0, j = 1,2$, then $P_1^* = (b+B) + T$ and $P_2^* = b + T$. If the foreign originating demands respond in exactly the same way to U.S. price changes as U.S. originating demands, then the optimal prices are exactly twice the Boiteux-Steiner prices; i.e., if $R_j = 1, j = 1,2$, then $P_1^* = 2(b+B)$ and $P_2^* = 2b$.

The optimal prices may also be stated in terms of the ratio r_j of foreign originating to domestic originating demand in each period, if the ratio of foreign to domestic demand in period j is invariant to the price level. This would be consistent with the widely discussed view that "every domestic originating call begets a certain number of foreign originating calls." Consequently, if the "every call begets a call" hypothesis is empirically true, then the optimal pricing rules are

$$P_1^* = [(b+B) * (1+r_1)] + [T * (1-r_1)]$$
$$P_2^* = [b * (1+r_2)] + [T * (1-r_2)].$$

An important implication of these results is that if $T > b+B$, then the optimal peak and off-peak prices increase as the fraction of foreign to domestic demand decreases. This again emphasizes the need for incentive compatible accounting rates and collection rates which have the "correct" economic relationship.

ACCOUNTING RATE POLICY IMPLICATIONS

This section provides insights regarding implementation strategies that achieve some efficiency gains while balancing concerns about disruptions in the cash flows of correspondents. To understand the financial aspects of telephone message accounting, one must consider the following elements, country by country:

1. the level of the collection charges to the customer (called *collection rates*);
2. the level of the accounting charges established between telephone administrations (called *accounting rates* and/or *surcharges*);
3. the units of time chosen to record and account for the calling volumes (expressed in seconds, minutes, or pulses);
4. the total calling volume of telephone traffic, in each direction, between administrations (expressed in messages and/or minutes);
5. the rates of exchange between national currencies or the medium of exchange used in settlements (called *exchange rates*); and
6. the costs involved in the establishment and maintenance of telephone service (such as circuit and switching costs, access charges, or operator handling expenses).

The interaction among these elements determines the revenue available for settlement.

Some aspects of the efficient/incentive compatible settlement rate structures discussed above may not be practical to implement in the short run. For example, the FCC's Uniform Settlements Policy for Parallel International Communications Routes (CC Docket No. 85-204) requires "all carriers providing the same service to the same foreign point to have the same accounting, settlement, and division of tolls arrangements with the foreign administration." Our examination of efficient settlement schedules has shown that: (a) collection and accounting rates should be based on marginal cost, and (b) accounting rates should reflect the structure of collection rates.

Consequently, it may be efficient and incentive compatible for two U.S. carriers to have different accounting rates with a foreign correspondent if the U.S. carriers have different cost structures. The desire to promote competition would in fact be consistent with the implementation of different settlement rates if the firms have different costs. In the long run, as competitive pressures drive out high-cost providers, all firms might be expected to have similar costs. But certainly this could not be expected in the short run. As a result of these considerations, we conclude that current regulations of the FCC and of foreign administrations may limit the ability of international carriers to adopt fully efficient and incentive-compatible collection and account-

ing-rate structures. It is important, therefore, that international carriers identify pricing strategies that improve the status quo while continuing to move toward market-driven price structures.

Various international carriers have begun to implement time-of-day collection rate structures. The results in previous sections indicate that efficiency requires that a time of day structure also be implemented for accounting rates. Since time-of-day accounting rates will depend on traffic patterns, it is clear that these may differ among carrier pairs. This is appropriate, since settlement rates should reflect the underlying marginal costs incurred by parties to the joint agreement. Implementation of incentive compatible settlement rate structures may require departures from status quo accounting-rate practices. Typically, the settlement rates for partners to a joint agreement are identical. That is, the settlement rates applied to inbound and outbound calls are the same. Incentive compatibility may require that different settlement rates be applied to inbound and outbound calls, respectively. The extent of any differential treatment will depend on the relative marginal costs of the partners. Perhaps even more problematic is the fact that incentive compatible settlement rates themselves may change as the levels of inbound and outbound traffic changes. This will occur if the cost functions of the partners exhibit increasing returns to scale. Finally, existing settlement rates generate levels of revenue for correspondents that foreign PTTs may be reluctant to give up.

Toward Implementation

Some of these impediments to changes in the structure of settlement rates may require enactment of FCC and Foreign Administration policy changes. However, some movement toward incentive compatible and efficient settlement rates can be achieved within the current regulatory framework. The accounting rate level, and structure, need to evolve to match the new, more competitive, environment. Without a change, accounting rates could retard the development of efficient, low-cost international telecommunications.

Accounting rates were initially established as a revenue sharing mechanism; the accounting rate level was set at a level approximately equal to the collection rate that each administration charged. The initial flat rate structure of the accounting rate was consistent with the flat rate collection rate structure that administrations initially used for international services. The relationship of the accounting rate to the underlying unit cost of provisioning international service was closely aligned when the initial accounting rate levels were set. For a

monopoly environment, this philosophy was appropriate and equitable and insured a financial commitment by both partners. The following principles are useful guides in today's more competitive environment:

- Establish accounting rate levels that reflect the character of the underlying cost of provisioning the international;
- Establish accounting rate levels and structures that create financial incentives for both partners to stimulate and grow their respective markets profitably; and
- Establish accounting rates that provide fair compensation to the partner terminating the imbalance of traffic.

Establish Accounting Rates Based on Underlying Costs

As collection rates decline, it is necessary that accounting rates be adjusted in order to maintain the efficiency of pricing relationships in the international market. Efficiency in the market can only be attained if collection rates and accounting rates bear the correct economic relationship. The nature of these relationships were discussed in Section 3. Optimal collection and accounting rates were shown to be dependent on marginal production costs, and the ratio of foreign to domestic originating demands in a particular period.

The downward adjustment of collection rates in response to declines in the cost of providing international service dictates that accounting rates also be reduced if the market is to remain efficient. When accounting rates are set equal to the efficient collection rates, the most profitable arrangement is to then set efficient collection rates, irrespective of the ratio of inbound to outbound traffic. However, when accounting rates are not equal to the efficient collection rates, the ratio of inbound to outbound traffic has a substantial influence on the most profitable collection rate. If the ratio of inbound to outbound traffic is less than one, i.e., $r < 1$, then the accounting rate should be reduced as the collection rate declines. If $r > 1$ then the accounting rate should be increased as the collection rate declines. In any bilateral market, the ratio of inbound to outbound traffic will be greater than one for one partner and less than one for the other partner, the only exception being the case of balanced traffic. Consequently, the implementation of more efficient accounting and collection rates creates significant tradeoffs in the division of cash flows associated with international telecommunications.

If one administration responds to lower facility costs by reducing collection rates, and the other does not, then a greater two-way traffic imbalance between the two administrations is likely. The failure of

administrations to negotiate lower accounting rates as facility costs decline is a national issue. If one administration refuses to reduce the accounting rate to reflect changes in costs, it can effectively impose significant disincentives for the other administration to reduce their collection rates.

Matching Accounting Rates with Collection Rate Structures

Historically, accounting rates implemented revenue sharing by establishing an accounting rate that was typically the average of the collection rates charged by two cooperating international carriers. Those initial collection rates were also flat rate, and not time-of-day sensitive. As time-of-day rates were introduced in the domestic collection rate plans of each international carrier, these rate structures were also applied to international tariffs. The savings that accrued to each carrier from lower facility costs and greater network efficiencies were the basis for lower collection rates. However, in most cases the accounting rate agreements were not changed to reflect the time-of-day nature of the collection rates. The time-of-day collection rate structures have proven to be effective pricing strategies that moved traffic away from peak periods and stimulated off-peak call volumes. The flat rate nature of accounting rates may create disincentives to promote outbound traffic growth. As an example, the U.S.–Japan market has a flat accounting rate of $1.17 in each pricing period. The revenue margin (defined as the difference between the collection and accounting rate) varies across periods; this is due in part to the flat accounting rate. The off-peak revenue margins are negative. In contrast, the U.S. to U.K. market has a time-of-day accounting rate structure of $1.06 peak and $.76 off-peak. The revenue margin in the U.S./U.K. market is $0.26 in the off-peak period.

Moving the accounting rate to a time-of-day structure should be the preferred accounting rate structure where collection rates are time-of-day sensitive. This is in keeping with a revenue sharing concept that would reflect lower accounting rates where lower collection rates are deemed appropriate. The principle that should be followed is that the accounting rate should parallel the structure of the collection rate. Implementation of both lower accounting rates and time-of-day structure are the most appropriate steps for aligning the financial arrangements between partners.

Recognize the Need for Transition

Another factor that weighs heavily in the decision to move to more efficient financial arrangements is the impact of reducing the net settlement amount. For a two-way traffic stream that is relatively

balanced, moving to a peak/off-peak structure results in small net changes in the net settlement. As the traffic stream becomes heavily imbalanced (i.e., one partner generating more than 60% of the two-way traffic), a change in the accounting rate to time-of-day will significantly change the net settlement. In a growing traffic stream this impact can be mitigated by recognizing the need to make a gradual transition to the appropriate structure and establish several interim rate steps over a two or three year horizon to reach the end objective. Moving away from the conventional application of a 50/50 flat rate accounting-rate structure should also be considered, if it can achieve a more market oriented financial structure. One accounting-rate structure recently agreed to in the U.S. was a growth-based accounting-rate structure. This has a two-tier accounting-rate structure. The current accounting-rate level would be maintained for traffic that does not exceed historical levels in a test year. Traffic greater than test-year demand levels, from either administration, would be settled at the lower accounting rate. This approach would achieve settlement stability and provide incentives for both partners to stimulate additional traffic.

SUMMARY

In summary, accounting rate levels and structure have significant influence on collection rate strategies of international telecommunications carriers and foreign administrations. The evolving nature of the international telecommunications market suggests that fundamental changes in FCC policies affecting collection and accounting rates need to be examined. Based on this analysis, we recommend that the actions under consideration should include:

- A general lowering of accounting rate levels to reflect the lower unit cost in provisioning international services.
- Developing accounting-rate structures that match the collection rate structure of the two-way market; and
- Recognize the transitional problems of achieving an efficient settlement structure by adopting, where necessary, nonconventional financial arrangements that provide incentive for both partners to grow and stimulate two-way traffic.

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