

Reconciling Competition and  
Monopoly in the Supply of  
International  
Telecommunications Services:  
A U.S. Perspective

by Evan Kwerel

Do not quote without the permission of the author.  
©1987 Columbia Institute for Tele-Information

Columbia Institute for Tele-Information  
Graduate School of Business  
Columbia University  
809 Uris Hall  
New York, NY 10027  
(212)854-4222

RECONCILING COMPETITION AND MONOPOLY IN THE SUPPLY OF  
INTERNATIONAL TELECOMMUNICATIONS SERVICES: A U.S. PERSPECTIVE

Evan Kwerel

September 1987

Office of Plans and Policy  
Federal Communications Commission  
Washington, D.C. 20554

---

This paper was presented on June 20, 1987 in Paris at the Center for Telecommunications and Information Studies conference on "Asymmetric Deregulation." Portions of this paper were adapted from Kwerel (1984). The opinions and conclusions expressed here are those of the author and do not necessarily reflect the policies or views of the Federal Communications Commission or any other organization or individual. I wish to thank Tom Spavins for helpful comments and suggestions; Peyton Wynns and Ken Stanley for germane data; and Michele Harding for able editorial assistance.

RECONCILING COMPETITION AND  
MONOPOLY IN THE SUPPLY OF  
INTERNATIONAL TELECOMMUNICATIONS  
SERVICES: A U.S. PERSPECTIVE

Evan Kwerel

working paper number 233

Reconciling Competition and Monopoly in the Supply of International  
Telecommunications Services: A U.S. Perspective

Evan Kwerel

I. INTRODUCTION

In recent years the United States has been pursuing a policy of promoting competition in common carrier telecommunications. The greatest changes have occurred in the domestic market. The most dramatic of these changes was AT&T's divestiture of its local operating companies on January 1, 1984. The international market has been changing as well. Until 1984 AT&T was the only company providing international message telephone service (IMTS). Now MCI International (MCII) and U.S. Sprint have entered the market and additional carriers are legally free to enter. Private facility-based competition is emerging as well. The PTAT-1 fiber optic cable is now scheduled to begin service between New York and London in 1989, and the Federal Communications Commission (FCC) has granted a Cable Landing License to Pacific Telecom Cable for a private fiber optic cable between the United States and Japan.



A strong case can be made for deregulating the domestic interexchange market.<sup>1</sup> The argument is premised on the assumption that the government will assure all interexchange carriers cost-based access to local exchange facilities. Competition is not expected to replace regulation in preventing local exchange carriers from exploiting their market power. In the international market, however, the U.S. government does not have such regulatory authority over similar bottlenecks. The position of foreign telecommunications authorities (relative to U.S. carriers who wish to interconnect) is analogous to that of U.S. local exchange carriers (relative to interexchange carriers) except that foreign telecommunications authorities are not subject to the jurisdiction of any U.S. governmental body. If promoting competition in the international market is to be in the U.S. interest some mechanism must be developed to prevent foreign telecommunications authorities from using such competition to extract undue concessions from U.S. international carriers.

The remainder of the paper is organized as follows. The second section provides background information on the international telecommunications market. The third section makes the general theoretical argument that there

---

1 See Cornell, Kelley, and Greenhalgh (1980); Kelly (1982); and NTIA (1987). See also Haring and Kwerel (1987), who propose a streamlined form of regulation to limit AT&T's ability to exercise whatever market power it may still possess.

are no benefits to be had from promoting competition for a single component of a product when another essential component is supplied by a monopolist. In the case at hand, the product is international telecommunications and the monopolized component is access to foreign countries. The fourth section considers the implications of relaxing some of the simplifying assumptions used in the third section. The fifth section examines FCC policies designed to address the problem raised in the third section and considers long-term strategies to move towards cost-based pricing of international telecommunications. The final section provides a summary and conclusions.

## II. BACKGROUND

All countries exercise control over international access to their domestic telecommunications networks by requiring an operating agreement of any carrier who wishes to establish a communications link from abroad. Operating agreements specify the type of service to be provided and the terms for sharing revenues between carriers.

Foreign governments generally delegate the responsibility for the provision of all telecommunications and postal services to a single government agency or public corporation. These public sector monopolies are referred to as administrations of posts, telegraph, and telephones (PTTs). There are a few exceptions to public ownership. Japan and the United Kingdom have recently privatized Nippon Telegraph & Telephone (NTT), and British Telecom (BT), respectively. The U.K. is allowing a single firm, Mercury Communications, to compete with British Telecom in both the domestic and international markets. Japan is about to permit competition with Kokusai Denshin Denwa (KDD), which currently is the only provider of international service. While these are positive developments, they do not signify the end of bottlenecks in these countries. KDD and its competitor will continue to depend on NTT for local distribution. In the U.K., Mercury has the right to terminate calls itself, but it is still highly dependent on BT for local distribution. The significance of these local bottlenecks depends in large part on the terms on which these new international carriers can obtain access to the

local networks. Furthermore, the fact that only a single competitor is being allowed to enter these markets may limit the effectiveness of competition in bringing price down to cost.

In the United States international telecommunications is provided by the private sector, but statutes and regulations have traditionally limited competition by restricting firms to specific segments of the market. For example, a 1943 amendment to the Communications Act prohibited Western Union from providing international service. Western Union divested its international services and accepted this restriction in exchange for the right to acquire its only competitor in the provision of domestic service. Another artificial barrier was created by the 1964 FCC decision to forbid AT&T from providing international record (data, telex, telegraph) service. This restriction protected the international record carriers (IRCs) from competition by AT&T.<sup>2</sup> In recent years Congress and the Commission have been reversing such anti-competitive policies. In 1982 the FCC eliminated the regulatory segmentation of the voice and record markets, allowing AT&T to enter the record market and the IRCs to enter the voice market (92 FCC 2nd 641, 1982). In 1981 Congress enacted the Record Carrier Competition Act of

---

2 TAT-4 decision, 37 FCC 1151 (1964). The major international record carriers include ITT World Communications Inc., RCA Global Communications Inc., Western Union International, FTC Communications Inc., and TRT Telecommunications Corp. None has more than a 30% market share.

1981. This allowed Western Union to re-enter the international record market and facilitated the entry of the IRCs into the the domestic record market (47 U.S.Code, Sec. 222, 1981).

In the voice market, local exchange carriers (LECs) control access to local networks. All interexchange voice carriers pay the same "access charges" to local exchange carriers for calls originating or terminating on a LEC's facilities. The access charges are the same whether a call is domestic or international. The FCC strictly regulates access charges and has been striving to assure that they are cost-based.

AT&T is still the predominant supplier of international message telephone service (IMTS), but MCI International and U.S. Sprint now offer service to a significant number of foreign countries. MCII offers international message telephone service to 52 foreign countries, and U.S. Sprint offers it to 29. These include, for both carriers, the five largest overseas markets --United Kingdom, West Germany, France, and Italy, as well as the large Canadian market. Given that competition in the IMTS market only began in 1984, it is not surprising that AT&T still carries most of the traffic. In 1985 (the most recent year for which data are available), AT&T carried 98.5% of all IMTS minutes and earned 99.1% of the revenues for all IMTS traffic (excluding Canada and Mexico) originating or terminating in the Continental U.S. (See table 1). AT&T's market share was several points smaller, however, in certain important markets such as the U.K. (See table 1).

Table 1

MARKET SHARES  
INTERNATIONAL MESSAGE TELEPHONE SERVICE  
ORIGINATING AND TERMINATING IN THE CONTINENTAL UNITED STATES\*  
1985

(Minutes and Revenues in Millions)

ALL OVERSEAS POINTS\*\*

|           | Outbound        |                | Inbound         |                | Total           |                 |
|-----------|-----------------|----------------|-----------------|----------------|-----------------|-----------------|
|           | Minutes         | Revenues       | Minutes         | Revenues       | Minutes         | Revenues        |
| AT&T      | 2136.0<br>98.3% | 760.7<br>99.0% | 1217.6<br>98.9% | 996.4<br>99.2% | 3353.6<br>98.5% | 1757.1<br>99.1% |
| MCII      | 29.4<br>1.4%    | 6.6<br>0.9%    | 11.9<br>1.0%    | 7.3<br>0.7%    | 41.3<br>1.2%    | 13.9<br>0.8%    |
| US Sprint | 8.4<br>0.4%     | 0.7<br>0.1%    | 2.0<br>0.2%     | 1.1<br>0.1%    | 10.4<br>0.3%    | 1.8<br>0.1%     |
| Total     | 2173.8          | 768.0          | 1231.5          | 1004.8         | 3405.3          | 1772.8          |

UNITED KINGDOM

|           | Outbound       |                | Inbound        |                | Total          |                |
|-----------|----------------|----------------|----------------|----------------|----------------|----------------|
|           | Minutes        | Revenues       | Minutes        | Revenues       | Minutes        | Revenues       |
| AT&T      | 283.2<br>94.6% | 179.0<br>95.1% | 281.9<br>96.7% | 135.5<br>96.9% | 565.1<br>95.7% | 314.5<br>95.9% |
| MCII      | 11.1<br>3.7%   | 7.0<br>3.7%    | 7.9<br>2.7%    | 3.7<br>2.6%    | 19.0<br>3.2%   | 10.7<br>3.3%   |
| US Sprint | 5.0<br>1.7%    | 2.2<br>1.2%    | 1.6<br>0.5%    | 0.7<br>0.5%    | 6.6<br>1.1%    | 2.9<br>0.9%    |
| Total     | 299.3          | 188.2          | 291.4          | 139.9          | 590.7          | 328.1          |

\* The table was derived from data contained in FCC (1987, Section 1, Tables 4, 6, and 8). Revenue is "net revenue" after settlements, that is, tariff revenue plus settlements received from PTTs minus settlements paid to PTTs.

\*\* Overseas points exclude Canada, Mexico, Alaska, Hawaii, Puerto Rico, U.S. Virgin Islands and Guam.

Table 2

AT&T INTERSTATE SWITCHED SERVICE  
1985

|                                | Minutes<br>(millions) | Revenues<br>(\$ millions) | Revenues/Minutes<br>(\$/minute) |
|--------------------------------|-----------------------|---------------------------|---------------------------------|
| <b>INTERNATIONAL</b>           |                       |                           |                                 |
| Overseas IMTS*                 |                       |                           |                                 |
| Outbound                       | 2136.0                | 760.7                     | 0.36                            |
| Inbound                        | 1217.6                | 996.4                     | 0.82                            |
| Subtotal                       | 3353.6                | 1757.1                    | 0.52                            |
| Canada**                       |                       |                           |                                 |
| Outbound                       | 832.9                 | 189.3                     | 0.23                            |
| Inbound                        | 845.4                 | 177.5                     | 0.21                            |
| Subtotal                       | 1678.3                | 366.8                     | 0.22                            |
| Mexico                         |                       |                           |                                 |
| Outbound                       | 336.1                 | 105.2                     | 0.31                            |
| Inbound                        | 170.0                 | 54.0                      | 0.32                            |
| Subtotal                       | 506.1                 | 159.2                     | 0.31                            |
| Total International            | 5538.0                | 2283.1                    | 0.41                            |
| ALL SWITCHED SERVICES***       | 79327.0               | 24122.2                   | 0.30                            |
| <b>PERCENT OF ALL SWITCHED</b> |                       |                           |                                 |
| Overseas Share                 | 4.2%                  | 7.3%                      |                                 |
| International Share            | 7.0%                  | 9.5%                      |                                 |

\* Overseas data are derived from FCC (1987, Section 1, Table 4). Overseas IMTS excludes traffic with Canada, Mexico, Alaska, Hawaii, Puerto Rico, U.S. Virgin Islands, and Guam.

\*\* Data for Canada and Mexico are from AT&T (letter from Ray M. Robinson to Ken Stanley of the FCC, May 8, 1987).

\*\*\* Revenues for "all switched services" are from AT&T ("FDC Report for the 12 Month Period Ended 12/31/85, Schedule 1A"). Minutes for "all switched services" are from AT&T (letter from D. J. Culkin to A. Halprin, Chief of the Common Carrier Bureau, FCC, November 24, 1986).

Table 3

AT&T OVERSEAS INTERNATIONAL MESSAGE TELEPHONE SERVICE\*  
1980-1985

|                                  | 1980   | 1981   | 1982   | 1983   | 1984   | 1985   |
|----------------------------------|--------|--------|--------|--------|--------|--------|
| <u>Revenues and Payouts</u>      |        |        |        |        |        |        |
| (\$ millions)                    |        |        |        |        |        |        |
| tariff revenue                   | 1592.7 | 1610.8 | 1704.3 | 2131.8 | 2431.3 | 2625.2 |
| foreign receipts                 | 563.1  | 613.0  | 748.5  | 840.8  | 835.8  | 996.4  |
| foreign payouts                  | 827.0  | 986.5  | 1250.3 | 1585.6 | 1801.7 | 1864.5 |
| net foreign payouts              | 263.9  | 373.5  | 501.8  | 744.8  | 965.9  | 868.1  |
| net revenue                      | 1328.8 | 1237.3 | 1202.5 | 1387.0 | 1465.4 | 1757.1 |
| <u>Percent of Tariff Revenue</u> |        |        |        |        |        |        |
| foreign payouts                  | 52%    | 61%    | 73%    | 74%    | 74%    | 71%    |
| net foreign payouts              | 17%    | 23%    | 29%    | 35%    | 40%    | 33%    |
| net revenue                      | 83%    | 77%    | 71%    | 65%    | 60%    | 67%    |
| <u>Minutes</u>                   |        |        |        |        |        |        |
| (millions)                       |        |        |        |        |        |        |
| outbound                         | 792.1  | 973.1  | 1228.6 | 1570.5 | 1883.7 | 2136.0 |
| inbound                          | 470.3  | 652.1  | 790.2  | 903.3  | 1016.0 | 1217.6 |
| net outflow                      | 321.8  | 321.0  | 438.4  | 667.2  | 867.7  | 918.4  |
| inbound/outbound                 | 0.59   | 0.67   | 0.64   | 0.58   | 0.54   | 0.57   |
| <u>Per Outbound Minute</u>       |        |        |        |        |        |        |
| (\$/minute)                      |        |        |        |        |        |        |
| tariff revenue                   | 2.01   | 1.66   | 1.39   | 1.36   | 1.29   | 1.23   |
| foreign payouts                  | 1.04   | 1.01   | 1.02   | 1.01   | 0.96   | 0.87   |
| retained tar. rev.               | 0.97   | 0.64   | 0.37   | 0.35   | 0.33   | 0.36   |
| <u>Per Inbound Minute</u>        |        |        |        |        |        |        |
| (\$/minute)                      |        |        |        |        |        |        |
| foreign receipts                 | 1.20   | 0.94   | 0.95   | 0.93   | 0.82   | 0.82   |
| <u>Per Total Minute</u>          |        |        |        |        |        |        |
| (\$/minute)                      |        |        |        |        |        |        |
| net revenue                      | 1.05   | 0.76   | 0.60   | 0.56   | 0.51   | 0.52   |

\* This table was derived from data contained in FCC (1980, 1981, 1982, and 1983 editions, Table 15), FCC (1984 edition, Table 13), and FCC (1987, Section 1, Table 4). Overseas IMTS is traffic originating and terminating in the continental U.S. to foreign points excluding Canada and Mexico. It excludes traffic with offshore points under U.S. jurisdiction -- Alaska, Hawaii, Puerto Rico, U.S. Virgin Islands, and Guam. "Foreign receipts" and "foreign payouts" are defined from the perspective of the United States. Foreign receipts are settlements payments from foreign PTTs to AT&T for terminating messages originating abroad. Foreign payouts are settlements payments from AT&T to foreign PTTs for terminating calls originating in the U.S.



Table 4

UNITED STATES CARRIERS  
OVERSEAS TELEX\*  
1980-1985

|                                  | 1980  | 1981  | 1982  | 1983  | 1984  | 1985  |
|----------------------------------|-------|-------|-------|-------|-------|-------|
| <u>Revenues and Payouts**</u>    |       |       |       |       |       |       |
| (\$ millions)                    |       |       |       |       |       |       |
| tariff revenue                   | 323.7 | 347.5 | 359.5 | 374.3 | 386.3 | 414.6 |
| foreign receipts                 | 181.5 | 180.2 | 194.9 | 200.3 | 214.9 | 218.1 |
| foreign payouts                  | 169.1 | 179.3 | 186.4 | 193.0 | 193.0 | 197.7 |
| net revenue                      | 336.1 | 348.4 | 368.0 | 381.6 | 408.2 | 435.0 |
| <u>Percent of Tariff Revenue</u> |       |       |       |       |       |       |
| foreign payouts                  | 52%   | 52%   | 52%   | 52%   | 50%   | 48%   |
| net foreign receipts             | 4%    | 0%    | 2%    | 2%    | 6%    | 5%    |
| net revenue                      | 104%  | 100%  | 102%  | 102%  | 106%  | 105%  |
| <u>Minutes</u>                   |       |       |       |       |       |       |
| (millions)                       |       |       |       |       |       |       |
| outbound                         | 130.6 | 152.1 | 158.8 | 170.8 | 174.2 | 189.1 |
| inbound                          | 148.3 | 166.4 | 176.6 | 188.2 | 203.9 | 206.8 |
| <u>Per Outbound Minute</u>       |       |       |       |       |       |       |
| (\$/minute)                      |       |       |       |       |       |       |
| tariff revenue                   | 2.48  | 2.28  | 2.26  | 2.19  | 2.22  | 2.19  |
| foreign payouts                  | 1.29  | 1.18  | 1.17  | 1.13  | 1.11  | 1.05  |
| retained tar. rev.               | 1.18  | 1.11  | 1.09  | 1.06  | 1.11  | 1.15  |
| <u>Per Inbound Minute</u>        |       |       |       |       |       |       |
| (\$/minute)                      |       |       |       |       |       |       |
| foreign receipts                 | 1.22  | 1.08  | 1.10  | 1.06  | 1.05  | 1.05  |

\* This table was derived from data contained in FCC (1980, 1981, 1982, and 1983 editions, Table 27), FCC (1984 edition, Table 25), and FCC (1987, Section 2, Table 1). Overseas Telex is traffic originating and terminating in the continental U.S. to foreign points excluding Canada and Mexico. It excludes traffic with offshore points under U.S. jurisdiction -- Alaska, Hawaii, Puerto Rico, U.S. Virgin Islands, and Guam. "Foreign receipts" and "foreign payouts" are defined from the perspective of the United States. Foreign receipts are settlements payments from foreign PTTs to U.S. record carriers for terminating messages originating abroad. Foreign payouts are settlements payments from U.S. record carriers to foreign PTTs for terminating calls originating in the U.S.

Table 5

COMPARISON OF OVERSEAS IMTS AND TELEX  
NET REVENUES AND FOREIGN SETTLEMENTS\*  
(\$ millions)  
(1980-1985)

|                          | 1980   | 1981   | 1982   | 1983   | 1984   | 1985   |
|--------------------------|--------|--------|--------|--------|--------|--------|
| <b>OVERSEAS IMTS**</b>   |        |        |        |        |        |        |
| net revenue              | 1328.8 | 1237.3 | 1202.5 | 1387.0 | 1465.4 | 1757.1 |
| net foreign payouts      | 263.9  | 373.5  | 501.8  | 744.8  | 965.9  | 868.1  |
| <b>OVERSEAS TELEX***</b> |        |        |        |        |        |        |
| net revenue              | 336.1  | 348.4  | 368.0  | 381.6  | 408.2  | 435.0  |
| percent of MTS           | 25%    | 28%    | 31%    | 28%    | 28%    | 25%    |
| net foreign receipts     | 12.4   | 0.9    | 8.5    | 7.3    | 21.9   | 20.4   |
| percent of MTS           | 5%     | 0%     | 2%     | 1%     | 2%     | 2%     |
| <b>TOTAL</b>             |        |        |        |        |        |        |
| net revenue              | 1664.9 | 1585.7 | 1570.5 | 1768.6 | 1873.6 | 2192.1 |
| net foreign payouts      | 251.5  | 372.6  | 493.3  | 737.5  | 944.0  | 847.7  |

\* The table was derived from Tables 3 and 4. As in those tables, traffic with Mexico, Canada, Alaska, Hawaii, Puerto Rico, U.S. Virgin Islands, and Guam were not included. As in Tables 3 and 4, "foreign payouts" and "foreign receipts" are defined from the perspective of the United States. Payouts are from U.S. carriers to foreign PTTs and receipts are from PTTs to U.S. carriers.

\*\* Revenue and payouts by AT&T.

\*\*\* Revenue and receipts of U.S. record carriers.

Tables 2 through 5 are helpful in assessing the size and composition of the international telecommunications market. Table 2 compares AT&T's international message telephone service minutes and revenue with its total interstate (domestic plus international) switched minutes and revenue. In 1985, 7 percent of AT&T's interstate switched minutes were international. The overseas market, which is the international market excluding Canada and Mexico, comprised 4.2 percent of AT&T's business when measured in the same way. International message telephone service accounted for nearly 10 percent of AT&T's switched revenue, and, overseas revenue comprised 7.3 percent of all switched revenue. These revenues are net of international "settlements." That is, they represent the revenues AT&T retained after making all payments to foreign correspondents for terminating messages abroad and collecting all receipts from foreign correspondents for terminating messages in the U.S.

Such settlements payments apply only to switched services, e.g. IMTS, telex, and telegraph. For private leased channel services, the U.S. carrier and its foreign correspondent both establish separate charges for their share of the facilities. This means that the total charge for renting a private line is the sum of the charges established by the PTT and the U.S. carrier. For switched services, however, only the carrier originating the call collects revenues from a customer. The price the originating carrier charges for switched services is known as the collection rate or tariff rate. Since

international communications are provided using facilities owned by both the originating and terminating carriers, some mechanism is generally needed for the originating carrier to compensate the terminating carrier for the use of the latter's facilities. The settlements process is designed to do just that.

The accounting rate is a negotiated rate carriers use instead of the collection rate in dividing revenues. While the collection rate varies depending on which end originates a call, there is a single accounting rate between two points. The accounting rate and the terms for dividing it determine the price each carrier must pay the other to terminate messages. For example, if the accounting rate were \$1.00 per minute and it were divided 50-50, the U.S. carrier would have to pay the PTT \$.50 for each minute of calls originating in the U.S. and similarly, the PTT would have to pay the U.S. carrier \$.50 per minute for calls originating abroad.

Accounting rates are denominated in U.S. dollars, Special Drawing Rights (SDRs), which are a weighted average of international currencies, or Gold Francs (GFs). Changes in the value of SDRs and GFs relative to the dollar affect the dollar amount of settlements denominated in these currencies.

The FCC requires an equal division of the accounting rate between a U.S. carrier and its foreign correspondent. This means that a U.S. carrier pays the same price for access to a given foreign PTT that it charges the PTT for

access here.<sup>3</sup> The settlements process, including this regulatory requirement, will be discussed in greater detail later in the paper. Given the uniform price for access, a carrier whose outbound minutes exceed its inbound minutes will make net settlements payments to its corresponding foreign carrier.

Table 3 shows the effect of the international settlements process on AT&T's revenues for the years 1980 to 1985. It indicates that for overseas IMTS AT&T's outbound minutes consistently exceeded its inbound minutes, resulting in net payments by AT&T to foreign PTTs. Net payments grew steadily from \$264 million in 1980 to \$966 million in 1984, and then declined slightly to \$868 million in 1985. Table 4 performs the same analysis for U.S. telex carriers. In the case of telex, inbound minutes exceeded outbound minutes, so PTTs made net settlements payments to U.S. carriers.

Table 5 compares net revenues and settlements for overseas MTS and overseas telex. For all years shown in the table net MTS revenues were significantly greater than net telex revenues, despite the fact that the net amount AT&T paid to foreign PTTs greatly exceeded the net amount PTTs paid U.S. telex

---

3 Some people speak of access as beginning at the midpoint of jointly owned international cables or at international satellites, whose circuits are leased on a "half-circuit" basis.

carriers. For example, in 1985 net telex revenues were 25 percent of net MTS revenues, while net settlements receipts by U.S. telex carriers were only 2 percent of the net settlements payouts made by AT&T to foreign PTTs. Considering both the MTS and telex markets, U.S. carriers paid out \$848 million in settlements payments to foreign PTTs.

Tables 2, 3, and 4 also present data on revenues, payouts, and receipts per minute of traffic. First consider Table 2. Table 2 shows revenue per minute for 1985. Several interesting comparisons can be made. First, AT&T's international revenue per minute exceeds that for all switched services combined, \$.41 per minute vs. \$.30 per minute. This explains the fact that the international share of revenues is larger than its share of minutes. Second, it is the overseas revenue per minute of \$.52 that makes the international average so high. The \$.31 revenue per minute for Mexico is about the same as the average for all switched services, and the \$.22 revenue per minute for Canada is below that average. Although one would expect it to be more costly to provide overseas service than domestic service, or service to neighboring countries, it is not obvious that cost differences account for the magnitude of these differences in revenue per minute. Finally, there is a large disparity between outbound and inbound revenue per minute for overseas traffic, but not for Canadian and Mexican traffic. For overseas traffic AT&T earned \$.82 per inbound minute but only \$.36 per outbound minute. This difference can take on special significance for new entrants such as MCII and U.S. Sprint. Table 1 shows that they have

been more successful in generating outbound traffic than in convincing foreign correspondents to send valuable return traffic.

The difference in per minute revenue for outbound traffic and inbound can be explained in terms of the difference between the level of the collection rate and the accounting rate. When the accounting rate exceeds the collection rate, inbound minutes are more valuable than outbound, because the carrier receives half the accounting rate on inbound minutes and retains less than half the accounting rate on outbound minutes. He would keep just half the accounting rate on outbound traffic if the collection rate equaled the accounting rate, but since it is less, he retains less than half the accounting rate.

Next consider table 3. The most striking trend was the decline in overseas IMTS tariff revenue per outbound minute. Between 1980 and 1985 it fell from \$2.01 per minute to \$1.23. The tariff revenue per outbound minute is the average price per minute AT&T billed U.S. customers for overseas calls. The decline reflects tariff reductions by AT&T in February and July of 1981 and May 1984. Foreign payouts per minute remained approximately constant through 1983. The payout per minute is the average price AT&T must pay foreign PTTs for access to their domestic networks. Subtracting the foreign payouts per minute from tariff revenue per minute gives AT&T's retained tariff revenue per outbound minute. Because tariff revenue per minute fell while payouts per minute remained constant, retained revenue per outbound

minute fell from \$.97 in 1980 to \$.35 in 1983. In 1984 the foreign payout per minute fell, but not by enough to offset the fall in per minute tariff revenue. But in 1985 the foreign payout per minute fell by more than the reduction in the per minute tariff revenue, raising the retained revenue per outbound minute to \$.36.

Foreign receipts per inbound minute of telephone service also fell during the period 1980 to 1985. This is the average price foreign PTTs paid AT&T for terminating calls in the United States. A question one might ask is why foreign receipts per inbound minute are not the same as foreign payouts per outbound minute given that on a country by country basis the price AT&T pays for terminating its calls abroad is the same price it charges PTTs for terminating foreign calls here. The answer is that what holds true country by country need not hold true for the average over countries given that the price of access varies across countries. A second question is why foreign receipts per inbound minute fell by more than foreign payouts per outbound minute. This could reflect either changes in the distribution of outbound and inbound minutes across countries with different prices of access or changes in the price of access across countries with different ratios of outbound to inbound minutes. For example, an increase in the number of inbound minutes from a country with a lower than average price of access would lower the foreign receipts per inbound minute without affecting foreign payouts per outbound minute.



An examination of Table 4 shows a downward trend in telex tariff revenue per outbound minute. Foreign payouts and foreign receipts per minute also fell slightly, perhaps indicating a reduction in the price of international access. Since telex traffic inbound to the U.S. exceeds traffic outbound, such a reduction in the price of access would be undesirable from the viewpoint of U.S. telex carriers as a group.

### III. A THEORETICAL MODEL OF PROMOTING COMPETITION PIECEMEAL

This section makes the theoretical argument that promoting competition among U.S. firms may only shift profits abroad because foreign PTTs have a monopoly on access to their domestic networks. Competition for a component of an international telecommunications service will tend to drive the price of that component down to cost. But the price of the total service may remain the same if some other essential component of the total service is controlled by a monopolist. In this case PTTs have a monopoly on access and appear quite willing to exercise their market power in order to provide revenues to subsidize domestic telephone and postal rates. This conclusion raises questions about the wisdom of deregulating U.S. providers of international telecommunication services without taking into account the possible reactions of foreign telecommunications authorities.

Promoting competition among firms supplying the U.S. component of international telecommunications services is analogous to promoting competition among manufacturers of hammer handles when the manufacture of hammer heads is controlled by a monopolist. Handles and heads are used in fixed proportions in the production of hammers. Each hammer requires exactly one head. Likewise, each minute of international telephone conversation requires one minute of access to a foreign telephone network.

For simplicity of exposition assume that the head and the handle are assembled by the customer. (The results would be the unchanged if the handle manufacturer also assembled the hammers). Suppose initially that government regulation limits the right to manufacture hammer handles to a single firm. It would be in the interest of the two firms in this "bilateral monopoly" to collude with each other so that the total price of hammers would be at the level that would maximize the profits of an integrated monopoly manufacturer of hammers. The individual prices of handles and heads would be the outcome of bargaining between the two firms and would determine the division of profits between them. But assuming that handles and heads are used only to manufacture new hammers, the customer would not care about the individual prices of handles and heads. Now suppose the government eliminates the regulatory barrier to manufacturing handles and there are no significant economies of scale in the production of handles. Competition will drive the price of handles to the marginal cost of production but will not benefit the consumer of hammers because the head monopolist will raise the price of heads to keep the price of hammers at the monopoly level. The firm with the monopoly on heads might even decide to produce handles itself and thus become a vertically integrated hammer manufacturer. But there would be no gain to doing so if the market for handles were perfectly competitive since handles would be supplied at marginal cost. "Any monopoly profits to be earned from controlling the manufacture of hammers could be captured by control of one essential component of hammers, such as the heads" (Posner 1971, 31).

The same reasoning suggests that if the FCC succeeded in creating perfect competition among U.S. international carriers, users would still pay monopoly rates but all the monopoly profits would be captured by the PTTs. Under these circumstances, a PTT could acquire access to the U.S. domestic network at cost, but could set the fees for access to its network at monopoly levels. Foreign callers would pay high rates because the PTTs would be setting the charges for calls originating abroad, and U.S. callers would pay high rates because U.S. carriers would need to set high rates to cover the high cost of access to foreign networks.

#### IV. QUALIFICATIONS

The foregoing analysis was simplified in several respects. It assumed that absent free entry, U.S. and foreign suppliers would collude to maximize joint profits, that the final product is a homogeneous good, that U.S. firms minimize the cost of producing a given output, and that PTTs would choose to exploit competition among U.S. firms. The discussion also did not take account of the FCC's international settlements policy, which is designed to prevent a PTT from playing competing U.S. carriers off against one another. Under these simplifying assumptions introducing competition would have no effect on economic efficiency; it would only alter the distribution of profits: Under bilateral monopoly, profits are divided between the U.S. firm and the PTT. Under pure competition among U.S. firms, all the economic profits would be shifted to the PTT. The final output price and quantity produced would be the same under either market structure given that these assumptions hold. Whether these conclusions still hold if the simplifying assumptions are altered will now be considered.

##### A. Competition May Increase Economic Efficiency

###### 1. Competition May Lower Output Prices

The first qualification is that competition among U.S. suppliers of international telecommunications may benefit U.S. consumers if the U.S. carrier and the PTT were not maximizing their joint profits prior to the introduction of competition. If the U.S. carrier and the PTT did not successfully collude, each might set such a high price for its component of

the service that the sum of the prices of each component would be above the level that would maximize the profit of a single supplier of the total service. In this case competition would reduce the price consumers pay for end-to-end service to the level that would maximize the profit of a single supplier of the total service. That is, the reduction in the price of the component for which competition was introduced would not be fully offset by an increase in the price of the component which continued to be monopolized.<sup>4</sup> While competition under these circumstances would make U.S. users of international telecommunications better off it would also make U.S.

---

4 This qualification can be illustrated in terms of the preceding hammer example. It can be shown that output is lower and the total price higher when each firm maximizes its profits taking the other's price as given (i.e. acts as is postulated in a "Cournot" model of oligopoly pricing) instead of colluding to maximize joint profits. Suppose that the two firms failed to appreciate their mutual interdependence, and that the handle maker set his price taking the price of heads as fixed, and the head maker did the same taking the price of handles as fixed. The head maker would see customers as willing to pay a price for heads equal to the maximum amount these customers would pay for hammers minus the price of handles. Analogously the handle maker would see his derived demand as the market demand for hammers minus the price of heads. The head maker firm acting as a monopolist would choose an output so that  $MR - P_j = MC_i$ , where  $MR$  is the marginal revenue associated with hammers,  $P_j$  is the price of handles and  $MC_i$  is the marginal cost of heads. The price he would wish to charge would be the price on his derived demand curve associated with this output. This price would exceed marginal cost. That is  $P_i > MC_i$ . Analogous conditions would hold for the handle maker. At the Cournot equilibrium each firm must be producing the same number of units of output and charging the profit maximizing price given the price the other firm is charging. In contrast the condition for maximizing joint profits is  $MR = MC_i + MC_j$ . The output which satisfies these conditions must be greater than the output satisfying the Cournot conditions since under the Cournot solution  $MR = MC_i + P_j > MC_i + MC_j$ , and the marginal revenue curve must cut the marginal cost curves from above at a profit maximizing solution.

suppliers of such services worse off. The reduction in profits to U.S. firms may or may not be greater than the benefits to U.S. consumers. Economic efficiency, however, would increase since prices would be lower and total world profits would be greater.

This qualification may be more germane to introducing competition in the supply of international circuits than in international common carrier service. U.S. international carriers and PTTs cannot provide international communications without mutual cooperation. Given this fact, collusion between a single U.S. carrier and PTTs is a very likely outcome. In contrast, Comsat and Intelsat are not essential to the provision of telephone and record service. U.S. carriers and PTTs have the option of using their own underseas cables. Since cooperation with Comsat/Intelsat is not essential, collusion is a less likely outcome. The desire of carriers to build TAT-8 and TAT-9, high capacity fiber optic submarine cables between the U.S. and Europe, despite apparently large amounts of excess satellite capacity, suggests that the carriers and Comsat are not acting like an integrated monopolist. Thus introducing competition with Comsat/Intelsat may reduce the price consumers pay for end to end international service. With vigorous competition for this input, the price for end to end service would be likely to fall to the level charged by a fully integrated monopolist. It should be noted that the same benefits could be achieved by allowing carriers to own and operate international satellites. If carriers could own these facilities they would face the true

cost of using satellite circuits as opposed to the marked up price charged by Comsat/Intelsat. In this case as well, the price of end to end service would fall to that charged by a fully integrated monopolist.

## 2. Competition May Increase Product Diversity

The second qualification is that introducing competition for components of a telecommunication service may increase welfare by increasing product diversity. For example, allowing competitive entry into the provision of earth stations may allow certain customers to obtain a design better suited to their needs. The vertical integration literature can be used to analyze this issue if one is willing to assume that a single U.S. carrier (or a small number of U.S. carriers acting as a cartel) would collude with PTTs to price the final service at approximately the level that would be set by a fully integrated monopolist. Several recent theoretical papers conclude that vertical integration reduces product diversity.<sup>5</sup> That is, product diversity is greater when the final product is supplied by a monopolistically competitive industry which buys an input from a monopolist than when the input monopolist vertically integrates and becomes the sole supplier of the final product. Perry and Groff (1983) conclude that a vertically integrated monopolist will generally provide too little product diversity and that economic efficiency is generally greater under

---

5 See Dixit (1981), and Perry and Groff (1983).



monopolistic competition.

Dixit (1981), however, using a slightly different theoretical model of monopolistic competition concludes that product diversity would be excessive under monopolistic competition and that welfare would be higher under a vertically integrated monopolist. Thus the theoretical literature offers no unambiguous conclusion about whether the increase in product diversity resulting from introducing competition is desirable.

### 3. Eliminating Regulation May Reduce Production Costs

The third qualification is that introducing competition among U.S. firms could reduce production costs. This would ultimately benefit U.S. users to the extent that PTTs do not offset these savings by increasing their charges for access. A regulated monopoly may not cost minimize because rate base regulation may distort its incentives or because the absence of pressure from competitors may permit managerial slack.<sup>6</sup> For example, some have claimed that Comsat has not been providing earth station services in the least costly manner.<sup>7</sup> They argue that for many users small specialized earth stations would be less costly than Comsat's huge general purpose earth stations. It should be noted that the distortion induced by rate base

---

6 See Averch and Johnson (1962) and Liebenstein (1966).

7 See "Earth Station Ownership," 97 FCC 2nd 444, 1984.

regulation could be corrected by ending such regulation and substituting either unregulated competition or an unregulated monopoly.

B. PTTs May Choose Not to Exploit Competition Among U.S. Firms

The fourth qualification is that the foreign correspondents might not fully exploit the opportunity to profit from increased competition among U.S. firms. Since foreign telecommunications entities are either government agencies, public corporations, or government regulated private corporations it may not be appropriate to assume that they will act like unregulated profit maximizing monopolists in setting the terms for access to their local exchange. Examining the historical record of PTT behavior may be helpful in addressing this issue. It should be noted, however, that history may give only limited guidance in this rapidly changing areas as more countries adopt new pro-competitive telecommunications policies.

The conventional wisdom is that PTTs set high telecommunications rates to provide revenues to subsidize their postal services.<sup>8</sup> Table 6 shows that in March 1981 the international telephone rates to the U.S. exceeded those from the U.S. for fifteen out of the seventeen European countries listed in the table. The average dialed call charge per additional minute during peak hours was \$2.66 to the U.S. and \$1.99 from the U.S. The average rate from

---

8 See U.S. General Accounting Office (GAO) (1983, 15).

Table 6

INTERNATIONAL DIALED CALL CHARGES  
PEAK HOURS  
COST PER ADDITIONAL MINUTE  
1981

| Country      | TARIFF<br>TO U.S.* | TARIFF<br>FROM U.S.** | PERCENTAGE<br>DIFFERENCE<br>IN TARIFFS | % OF TOTAL<br>MINUTES<br>TO U.S.*** | % OF TOTAL<br>MINUTES<br>FROM U.S. |
|--------------|--------------------|-----------------------|--|-------------------------------------|------------------------------------|
| Austria      | \$2.73             | \$2.05                | 33.3%                                  | 1.0%                                | 1.1%                               |
| Belgium      | \$3.50             | \$2.05                | 70.9%                                  | 2.6%                                | 2.6%                               |
| Denmark      | \$2.89             | \$2.05                | 41.1%                                  | 1.0%                                | 1.1%                               |
| Finland      | \$2.43             | \$2.05                | 18.7%                                  | 0.4%                                | 0.4%                               |
| France       | \$2.44             | \$2.05                | 19.0%                                  | 10.0%                               | 8.8%                               |
| German FR    | \$3.51             | \$2.05                | 71.1%                                  | 15.4%                               | 22.4%                              |
| Greece       | \$1.78             | \$2.05                | -13.3%                                 | 5.2%                                | 3.5%                               |
| Ireland      | \$1.79             | \$1.55                | 15.5%                                  | 1.6%                                | 2.0%                               |
| Italy        | \$1.92             | \$2.05                | -6.3%                                  | 8.1%                                | 8.2%                               |
| Luxembourg   | \$3.29             | \$2.05                | 60.2%                                  | 0.2%                                | 0.2%                               |
| Netherlands  | \$2.81             | \$2.05                | 36.8%                                  | 4.6%                                | 3.5%                               |
| Norway       | \$3.53             | \$2.05                | 72.3%                                  | 1.8%                                | 1.4%                               |
| Portugal     | \$2.48             | \$2.05                | 20.9%                                  | 0.6%                                | 0.9%                               |
| Spain        | \$3.27             | \$2.05                | 59.3%                                  | 2.6%                                | 2.8%                               |
| Sweden       | \$2.36             | \$2.05                | 15.0%                                  | 3.2%                                | 2.1%                               |
| Switzerland  | \$2.81             | \$2.05                | 36.8%                                  | 4.0%                                | 4.4%                               |
| UK           | \$1.78             | \$1.55                | 14.7%                                  | <u>37.7%</u>                        | <u>34.6%</u>                       |
|              |                    |                       |  | 100%                                | 100%                               |
| AVERAGE      | \$2.66             | \$1.99                | 33.8%                                  |                                     |                                    |
| WTD. AV.**** | \$2.37             | \$1.87                | 26.7%                                  |                                     |                                    |

\* Tariffs in effect March 1981 (Tarifica, 1981).

\*\* Tariff in effect February 8, 1981 to July 15, 1981. From June 6, 1980 to February 7, 1981 the rate was \$2.10 to Continental Europe and \$1.60 to U.K. and Ireland. On July 16, 1981 the tariff was cut 35%, reducing the rate to \$1.35 for direct dialed calls to Continental Europe and \$1.00 to U.K. and Ireland.

\*\*\* In 1981 there were 365 million minutes to the U.S. from the listed countries and 469 million minutes from the U.S. to these countries (FCC, 1981 edition, Table 15).

\*\*\*\* Each country's tariff is weighted by its share of total minutes for the listed countries.

Table 7

INTERNATIONAL DIALED CALL CHARGES  
 PEAK HOURS  
 COST PER ADDITIONAL MINUTE\*  
 1986

| Country     | TARIFF<br>TO U.S. | TARIFF FROM U.S. |      |           |
|-------------|-------------------|------------------|------|-----------|
|             |                   | AT&T             | MCII | US SPRINT |
| France      | \$1.39            | 1.09             | 1.03 | 0.96      |
| German FR   | \$1.98            | 1.09             | ---- | ----      |
| Switzerland | \$2.43            | 1.09             | 1.03 | ----      |
| U. K.       | \$0.94            | 0.99             | 0.94 | 0.87      |

\* Tariffs in effect January 1986. Tariffs from the U.S. are those filed with the FCC by AT&T, MCI, and US Sprint. Tariffs to the U.S. are from Center for Communications Management (1986). The exchange rates used to convert the foreign tariffs are from U.S. Council of Economic Advisers (1987, Table B-105).

Europe exceeded the rate from the U.S. by 34 percent. The same general conclusion holds when comparing weighted averages, where each country's tariff is weighted by its share of total minutes. Weighted in this way, the average tariff to the U.S. was \$2.37 and from the U.S. \$1.87. The weighted average is lower because the rates to and from the U.K. are lower than for the Continent and Britain had over a third of the traffic to and from the seventeen countries in the table. The weighted average tariff to the U.S. exceed the tariff from the U.S. by 27 percent.

It is worth noting that there was a significant amount of variation across countries in the tariff to the U.S. For example, the rate from Germany to the U.S. exceeded the rate in the reverse direction by 71 percent, while the rate from the U.K. to the U.S. exceeded the rate in the reverse direction by only 15 percent. Given that the cost of providing a transatlantic call is unlikely to vary greatly across European countries, this variation in tariffs suggests that countries differ in the degree to which they have chosen to exercise their market power.

Tariffs from Europe to the U.S. have continued to exceed those in the reverse direction. This is illustrated in table 7, which shows rates for January 1986 for four European countries. For calls from the U.S. it gives the tariffs of MCII and US Sprint as well as AT&T. Tariffs to the U.S. exceeded those from the U.S. for three of the four countries. The one exception was the U.K., and that was only for AT&T's rates. MCII's rate was

the same as the rate from the U.K. to the U.S., and US Sprint's rate was lower.

The persistence of rates of return above competitive levels would be strong evidence that PTTs are exercising their monopoly power. There are no direct data on the PTTs' rates of return on overseas telephone service. But an inference can be drawn from the fact that AT&T has found overseas telephone service highly profitable. In 1979, AT&T's rate of return (the ratio of net operating earnings to investment) was 36.5 percent for overseas MTS service.<sup>9</sup> Under the reasonable assumption that the cost of providing service is approximately the same in both directions one need only show that the revenues of the overseas telecommunications authorities exceeded those of AT&T in order to conclude that these overseas correspondents were on average earning a substantial rate of return on overseas telephone

---

9 U.S. GAO (1983, 7). 1979 was the last year AT&T was required to separately report its rate of return on overseas MTS. Overseas service (as opposed to international service) is generally defined as service between the lower 48 states and the rest of the world excluding Canada and Mexico. Under this definition Alaska, Hawaii, Puerto Rico, the Virgin Islands, and Guam are considered overseas points. Excluding Alaska, Hawaii, Puerto Rico, the Virgin Islands, and Guam (as was done in Tables 2, 3, 4, and 6) would almost surely have increased the reported rate of return. The basis for this conclusion is that both retained tariff revenue per outbound minute and foreign receipts per inbound minute were greater when these points were excluded, and the average cost per minute of serving these points is unlikely to be below that of the average for serving other overseas points. For example, in 1982 the retained tariff revenue per outbound minute was \$.37 when these points were excluded and \$.30 when included, and foreign receipts per inbound minute was \$.95 excluding these points and \$.62 including them.

service.

Foreign revenues would exceed those of U.S. carriers even if the collection rate were the same in both directions, as long as there is a net outflow of minutes from the U.S. abroad and the U.S. kept less than half its per minute earnings on outbound traffic. With the same collection rate, each side would earn the same revenues as long as inbound minutes equaled outbound -- tariff revenues would be the same and net settlement payments would be zero. Now suppose outbound minutes exceed inbound. Each side would continue to retain half the total revenues, provided that the U.S. carrier paid out exactly half the revenue it earned on those excess minutes, that is, if the accounting rate equaled the collection rate and the accounting rate was split 50/50. But if the the U.S. carrier paid out more than half it earned on each excess minute, then it would retain less than half the total revenues.<sup>10</sup> From table 3 one can see that this was the case, since AT&T's

---

10 The condition that revenue on inbound minutes exceeds retained revenue on outbound minutes is equivalent to the accounting rate exceeding the collection rate. Thus if the collection rate is the same in both countries, the country with the net outflow of traffic will keep the smaller share of the total revenue if the accounting rate exceeds the collection rate. This can be shown mathematically. Let  $C$  = collection rate,  $A$  = accounting rate,  $M_u$  = minutes outbound from the U.S.,  $M_f$  = minutes outbound from a foreign country (i.e. U.S. inbound minutes). Then U.S. net revenue is given by  $C M_u - .5A M_u + .5M_f = C M_u - .5A(M_u - M_f)$ . Likewise, foreign net revenue is given by  $C M_f + .5A(M_u - M_f)$ . The U.S. net revenue is less than the foreign net revenue if  $C M_u - .5A(M_u - M_f) < C M_f + .5A(M_u - M_f)$ , or if  $C(M_u - M_f) - A(M_u - M_f) < 0$ , which is equivalent to  $(C - A)(M_u - M_f) < 0$ . This is true if either  $A > C$  and  $M_u > M_f$ , or  $C > A$  and  $M_u < M_f$ . That is, the U.S. net revenues will be less than the foreign net revenues if either

foreign payouts per outbound minute consistently exceeded retained tariff revenue. Since foreign collection rates tend to exceed those in the U.S. this would make the U.S. share of total revenues even smaller.

An examination of past incidents in which PTTs have used competition among U.S. carriers to increase their share of revenues provides further insight into the likely reaction by PTTs to increased competition among U.S. firms providing international telecommunications services. In June of 1982, Nordtel, an association of the PTTs of Denmark, Finland, Iceland, Norway, and Sweden, sent identical letters to seven U.S. international service carriers (USISCs). The letters requested that the firms submit bids for providing new data services between the U.S. and the countries represented by Nordtel. The bids were to include the terms for dividing revenues between the USISC and the PTT. Nordtel proposed to award operating agreements to one or a limited number of carriers based on the competing bids. Shortly after the Nordtel letters were sent, the PTTs of the Benelux countries (Belgium, Netherlands, and Luxembourg) made a similar proposal to the same USISCs (U.S. Office of Management and Budget, 1982). The Nordtel and Benelux proposals are examples of PTTs attempting to increase their monopoly profits by forcing USISCs to compete for operating agreements. The

---

the accounting rate exceeds the collection rate and U.S. outbound minutes exceed inbound minutes, or if the collection rate exceeds the accounting rate and U.S. outbound minutes are less than inbound.



PTTs were unsuccessful in this particular effort because of a strong negative reaction by the FCC and the State Department.<sup>11</sup> In 1985 British Telecom International (BTI) and the European Conference of Postal and Telecommunications Administrations (CEPT) apparently attempted to lower telex rates unilaterally, in order to reduce their net settlement payments to U.S. carriers. The FCC was able to prevent this attempt as well.

The foregoing discussion suggests that at least certain PTTs may attempt to exploit the opportunity for greater profits created by increased competition among U.S. firms. This conclusion, however, appears inconsistent with the fact that foreign countries have been reluctant to grant multiple operating agreements for international switched voice service. Granting additional operating agreements would appear to strengthen the bargaining position of a PTT vis-a-vis U.S. carriers.

There are a number of possible explanations for the PTTs' lack of enthusiasm about granting multiple operating agreements. Interconnecting with additional carriers (as opposed to having carriers bid for an exclusive agreement) imposes immediate costs on a PTT. The PTT must install additional facilities and incur ongoing recordkeeping and other

---

<sup>11</sup> See Pearce (1983) for a discussion of the actions taken by the FCC and State Department.

administrative costs. Yet, the benefits to the PTT are neither certain nor immediate.

There are two reasons why PTTs may see little near-term prospect for successfully exploiting competition in the voice market. First, they may expect AT&T to retain a predominant market share for the foreseeable future. If this were the case, which is likely, AT&T would be in a position to defend itself against PTTs. A threat to terminate AT&T's operating agreement unless AT&T agreed to a higher accounting rate would not be credible. AT&T would know that the PTTs are as dependent on its traffic as it is on theirs. It would be some time before the new U.S. entrants would be able to fill the gap left by AT&T. AT&T's size also gives it the ability to respond to lesser threats. It can use its pricing and advertising policies to affect the amount of its outbound traffic going to a PTT. Even a five percent reduction in AT&T's traffic could be significant to a PTT. Finally, AT&T's size may enable it to influence the regulatory and political process in the U.S. Thus an adverse action taken against AT&T might quickly result in the U.S. government pressuring a foreign government to restrain its PTT.

Second, the FCC's international settlements policy may limit a PTT's ability to successfully whipsaw U.S. carriers. The constraints embodied in this policy may be particularly effective in the voice market because the net flow of voice traffic is outbound from the U.S. The FCC's anti-whipsawing

policies will be discussed in the next section.<sup>12</sup> PTTs may also fear reaction from other parts of the U.S. Government if they allowed multiple entry and then tried to exercise their market power. PTTs may not want to take this chance given the high profits they appear to be earning.

Another possible benefit of competition from a PTT's perspective is that the new entrants would stimulate traffic from the U.S. to the PTT. To attract customers the new entrants would be likely to underprice AT&T and AT&T would be likely to at least partially meet their price reductions. The level of new traffic stimulated by the price reductions would depend on the price elasticity of demand, which PTTs have traditionally viewed as relatively low. Moreover, it is not obvious that stimulating such traffic would necessarily be in the long run interest of the PTT. While additional traffic terminating at the PTT would increase the total settlement payments to the PTT at the current accounting rate, it could reduce the total profits available to split between U.S. and foreign carriers, if the collection rates prevailing before the introduction of competition were at the joint profit maximizing level.

---

12 The fact that PTTs were reluctant to grant multiple operating agreements does not imply that the FCC policies to prevent whipsawing are unnecessary. Without such a FCC policy, whipsawing might be more likely to succeed and PTTs might have seen competition among U.S. carriers as creating an opportunity for increasing their share of the benefits of international telecommunications.

In addition to the costs of interconnection and the lack of immediate certain benefits, there are two more possible explanations for the initial reluctance of PTTs to grant multiple operating agreements. First, the long term working relationship between PTTs and AT&T may have lead PTTs to identify with AT&T's interests, over the interests of potential entrants. Second, many PTTs are philosophically opposed to competition. They believe that telecommunications is a natural monopoly, i.e. service can be provided at the least cost by a single provider. In their view the primary outcome of competition will be higher costs. Even if competition increased their share of the net benefits from competition, they might oppose it because they believe competition is inefficient from a global perspective.

C. Current FCC Policies May be Adequate to Prevent PTTs From Exercising Their Market Power

The fifth qualification is that the analysis failed to take into account the FCC's policy of requiring U.S. international carriers to obtain its approval of the terms of their operating agreements. This policy, traditionally known as the "uniform settlements policy," and recently renamed the "international settlements policy" (ISP) has its origins over fifty years ago.<sup>13</sup> The policy has focused on preventing PTTs from playing one

U.S. carrier against another to the detriment of U.S. carriers and ratepayers. Such practices are often referred to as "whipsawing."

To prevent whipsawing the Commission has required that all operating agreements must: (1) provide for an equal division of the accounting rate between the U.S. carrier and the foreign PTT, and (2) specify the same accounting rates and settlement rates (the rates for converting currencies in settling accounts) for the same services on parallel routes (84 FCC 2nd 121, 1980).

In January 1986 the Commission extended the scope of the international settlements policy when it concluded that the policy applies to indirect transit traffic as well as to traffic routed directly, and to voice and enhanced services. The Report and Order also made clear that every change in an operating agreement is subject to Commission review. Thus a simultaneous request by all carriers to change the terms of their operating agreements is subject to review, even if the new agreements would be the same for all carriers (FCC 86-30, 1986).

---

13 Mackay Radio and Telegraph Company Inc., 2 FCC 592, 599 (1936). The policy was renamed in Implementation and Scope of the International Settlements Policy for Parallel International Communications Routes, Order on Reconsideration, CC Docket No. 85-204, FCC 87-61, released February 19, 1987.

The remainder of this section analyzes the effects of the requirements specified by the international settlements policy. These requirements potentially constrain PTTs in two ways. First, they limit the range of possible divisions of available revenue. Secondly, they limit a PTTs ability to change the current terms for dividing revenues. These will be discussed in turn.

A PTT's share of revenue earned on switched international services may be limited by the equal division requirement . The effect of the requirement depends on the direction of the net flow of traffic. When the net traffic flow is into the U.S. (as it is for record traffic) the best a PTT can do, given the equal division requirement, is to set a zero accounting rate and thus make no payments to U.S. carriers. Without the requirement, the accounting rate could be divided so that a PTT could receive net payments from U.S. carriers even though the net traffic flow was into the U.S. However, we observe no zero accounting rates for record services so the equal division requirement appears not to have been a binding limit on the foreign share of record revenues.<sup>14</sup>

---

14 There is one minor exception to the broad statement that there are no cases of a zero accounting rate. Western Union International has a sender keep all arrangement with Canada and Mexico. This arrangement, however, is a result of network design and not market power of the Canadians or Mexicans. Apparently the arrangement evolved because there is no inexpensive way to monitor the messages going to and from these countries given the way WUI's network is set up.

When the net traffic flow is out of the U.S., as with international MTS, the equal sharing requirement cannot limit a PTT's share of total revenue unless accounting rates affect the volume of traffic.<sup>15</sup> If traffic volume is independent of accounting rates the PTT can extract any share of total revenue from U.S. carriers by demanding a sufficiently high accounting rate.

If, however, an increase in the accounting rate induces U.S. carriers to raise their collection rates, which in turn reduces traffic originating from the U.S., the equal division requirement may limit a PTT's potential revenue share. If the PTT found the volume of outbound traffic falling as it increased the accounting rate, a higher accounting rate no longer translates into a greater share of a fixed level of revenues. In attempting to increase its share of the profits it might find the total revenues and profits shrinking, since at a sufficiently high accounting rate, U.S. carriers would be charging above the profit maximizing level of a joint monopolist. Moreover, the net flow of traffic might reverse from outbound to

---

15 Accounting rates would not affect traffic volume if they did not affect the pricing decisions of the carriers or if demand were highly inelastic. Pricing decisions might be unaffected if the accounting rate is arrived at through a bargaining process between a PTT and a single U.S. carrier or a group of U.S. carriers acting as a cartel. In this case the U.S. carriers might view the accounting rate as distributional device and not as the marginal cost of terminating traffic.

inbound as the accounting rate rose. With such a reversal, a high accounting rate would now imply high net settlements by a PTT to the U.S. carriers, just the opposite of what the PTT intended. Without the equal division requirement, a PTT facing perfectly competitive U.S. carriers could impose a division of the accounting rate so that U.S. carriers would receive only marginal cost for terminating the PTT's traffic, while they would pay the PTT a much higher fee, one set to maximize the monopoly PTT's profits, for terminating their messages. But with the equal sharing requirement the PTT cannot do this.

The second major effect of the international settlements policy is to limit a PTT's ability to change the terms of operating agreements. The two major instruments PTTs can use to win concessions from U.S. carriers are its power to grant or deny operating agreements, and its control over the distribution of return traffic. The equal division and uniformity requirements embodied in the international settlements policy are most effective in limiting the use of the second instrument.

In the record market, the uniformity requirement plays an important role in limiting a PTT's ability to use its control of return traffic to change the terms of operating agreements. When the balance of traffic is inbound to the U.S., as it is in the record market, PTTs are making net settlement payments to U.S. carriers and would benefit from a reduction in the accounting rate. Absent the requirement that all carriers have the same



accounting rate, a PTT could threaten to reduce the share of return traffic to carriers who refuse to accept a lower accounting rate, and increase the share to those who do. This is of immediate benefit both to the PTT, whose cost of terminating messages is reduced, and to those carriers for whom the increased volume of return traffic more than offsets the loss from the reduction in the accounting rate. Typically, it is a new entrant with minimal return traffic, who is the most willing to accept the reduced accounting rate. Since such a carrier's outbound traffic exceeds its inbound, it would benefit from a reduction in the accounting rate even if it were not allocated an increased share of the return traffic. The carriers whose return traffic was reduced would then be likely to agree to a reduction in their accounting rates rather than face a further reduction in return traffic. The uniformity requirement is intended to prevent PTTs from playing carriers off against each other in this way.

In the voice market, the uniformity requirement may be unnecessary to prevent such whipsawing, given that the equal division requirement remains in place. With a net flow of traffic to the PTT and the equal division requirement, the PTT would want an increase in the accounting rate.<sup>16</sup> The

---

<sup>16</sup> This assumes that raising the accounting rate does not significantly reduce the flow of traffic to the PTT.

PTT could threaten to reduce the share of return traffic to carriers who refuse to increase their accounting rate and increase the share to those who accept a higher rate. The initial carriers to accept such an offer could benefit if the increased share of return traffic were large enough to offset the loss from the higher accounting rate. However, the PTT could be temporarily worse off since it would be reallocating return traffic from carriers with lower charges for terminating messages to ones with higher charges. The PTT would not face this dilemma if the accounting rate could be divided unequally. In that case it could reallocate traffic to carriers who would terminate return traffic at a lower rate, while continuing to pay the PTT the same rate for traffic it terminated.

FCC regulations reflect the fact that the uniformity requirement is less important in the voice market than in the record market. The FCC has established a more streamlined procedure for waivers in the voice market than in the record market. There is a 21-day semi-automatic grant procedure for unopposed waiver requests to establish non-uniform accounting rates for voice service and a 60-day semi-automatic grant procedure for record service waivers (FCC 87-61, 1987).

The other tool a PTT can use to change the terms of operating agreements is its ability to grant or deny operating agreements. The uniformity and equal division requirements of the ISP are not sufficient to prevent PTTs from using this instrument to change the status quo, even when the net flow

of traffic is outbound from the U.S. If a PTT wants a greater share of the international communications revenues it can do so despite the ISP requirements by threatening to terminate the operating agreements of those carriers who refuse to accept its new terms. With competition among U.S. carriers, at least one carrier would accept the new terms as long as the terms provide positive profits. In the case of net outbound traffic, these new terms would specify higher accounting rates.

A PTT forcing U.S. record carriers to simultaneously change their accounting rate agreements is not merely a theoretical possibility. For example, in 1975 TRT, a small U.S. international record carrier, negotiated a reduced accounting rate with the British PTT. The new rate was \$1.75 per minute, while the prevailing accounting rate for telex traffic between the U.S. and the U.K. was \$2.25 per minute (66 FCC 2d 360, 1977). A lower rate would have favored the U.K. if the rate were applied to all carriers because the U.K. was sending four million more telex minutes to the U.S. than it was receiving from the U.S. The Commission rejected the new accounting rate because if it were allowed to go into effect the Commission reasoned that the U.K. could "whipsaw" the other carriers into accepting the unfavorable rate. Despite the Commission's rejection of TRT's accounting rate, the U.K. was eventually able to get the other carriers (ITT Worldcom, RCA, and WUI) to accept a lower accounting rate by threatening them with termination of their telex operating agreements (Povich 1980, 8). The modification of the ISP in January 1987 was designed to deal with such a contingency. As noted

above, the Report and Order states that any change in accounting rates is subject to Commission review, even if all carriers agree to make the same change.

It should be noted that the usefulness of a policy which tends to preserve the status quo depends on the desirability of that status quo. For example, in the voice market, one may presume that AT&T as the sole U.S. international carrier until 1984, was in a strong position to bargain for settlements rates that served U.S. interests. Thus preserving these terms of trade as additional firms enter the voice market may be a reasonable short run policy. But rejecting all changes is not a sensible long run policy. There is no reason to believe that all the current accounting rates are optimal, or would remain so as circumstances change. The FCC needs to know which proposed changes it should approve and which it should reject. This issue will be discussed in the section on policy.

#### D. Summary of Qualifications

The essence of the first three qualifications is that competition may increase economic efficiency. With a "bigger pie" the U.S. may gain even if its share of the pie shrinks. But it is also quite possible that competition may so reduce the U.S. share of the pie that the U.S. ends up with less. In particular it was found that: (1) Competition would lower the price of international communications to U.S. consumers if prior to its introduction U.S. and foreign suppliers had failed to cooperate and had set

prices for their components above the level that would maximize their joint profits. In this case, free entry into all services supplied by U.S. firms would unambiguously increase efficiency, but U.S. firms would see their profits shifted abroad. (2) If telecommunication services are not homogeneous products, introducing competition would increase product diversity. Efficiency would increase only if the increase in product diversity is not excessive. (3) Eliminating rate-base regulation and removing regulatory barriers to entry may induce firms to reduce their production costs. Rate base regulation could be removed, however, without allowing free entry.

The fourth and fifth qualifications concerned the behavior of PTTs and the FCC. Specifically, it was argued that: (4) PTTs may choose not to use increased competition among U.S. firms to increase their share of the international telecommunications profits. The high tariffs PTTs have traditionally charged and the attempt by the Nordtel and Benelux PTTs to extract monopoly rents from U.S. firms suggest, however, that at least some PTTs would be likely to exploit the opportunity for greater profits created by increased competition among U.S. firms. (5) The FCC international settlements policy reduces but does not eliminate the PTTs' ability to exercise their market power.

The fact that firms such as MCI wish to enter international MTS market is not inconsistent with the view that PTTs would be able to capture the

benefits from competition if the FCC did not enforce the international settlements policy. The new U.S. entrants may believe that vigorous enforcement of the ISP will prevent PTTs from exploiting competition among them. Alternatively, the new entrants may believe that the FCC will not take countermeasures but that profits are large enough to make entering the market worthwhile as long as the PTTs take some time to respond. In any case, the fact that firms wish to enter does not necessarily imply that total U.S. benefits will increase because these new entrants do not take into account the lost profits of the incumbent firm, AT&T.

## V. POLICY

It has been argued above that promoting competition among U.S. providers of international telecommunications services without taking account of the resulting loss of market power of these U.S. firms vis-a-vis PTTs is not a desirable option. There are two major alternatives to this course. The first would be to limit provision of international telecommunications to a single provider. Under this arrangement the structure of U.S. provision of international services would be similar to that abroad, except that the single U.S. firm need not be a government entity. The U.S. has soundly rejected this option. The second alternative would be to promote competition among U.S. firms but assure that the benefits are not undermined by the exercise of market power abroad. This alternative entails appropriately enforcing the FCC's international settlements policy, and a continued effort by the U.S. to promote competitive telecommunications policies throughout the world. The remainder of the paper will discuss this second option, focusing on how the FCC should implement the international settlements policy.

### A. Implementing the International Settlements Policy

#### 1. Policy Objectives: Efficiency vs. Equity

If the only concern is maximizing global economic efficiency, we should aim for setting the price of access at marginal cost. This could result in

deviating from the 50/50 split of the accounting rate to the extent that the cost of access differed at each terminating end. To achieve the efficiency benefits of such a price structure for access would also require that the remaining components of international service be priced efficiently. This would be the case if international services were fully competitive and the price of access to U.S. local exchanges continues to be appropriately regulated. Under such an industry structure reducing accounting rates to marginal cost would result in lower prices for end users and expanded industry output.

The goal of promoting cost-based telecommunications prices for U.S. users may conflict with the desire to achieve an equitable division of profits between U.S. international carriers and foreign PTTs for jointly provided international service. First, consider a uniform reduction in telex accounting rates. There is more inbound telex traffic to the U.S. than outbound traffic. Because of the 50/50 division of the accounting rate this means that PTTs make net settlements payments to U.S. record carriers. Given the current traffic patterns, a reduction in the accounting rate would reduce the net settlement payments to U.S. record carriers. But it might also reduce the price competitive U.S. carriers would charge U.S. users since it would reduce the marginal cost of terminating calls.

Second, suppose a new entrant in the telex market wants a waiver for a lower



accounting rate.<sup>17</sup> It proposes to set a lower collection rate than the incumbents. In contrast to the previous case in which the reduction in collection rates is speculative, here it is certain that at least initially, some U.S. customers will have lower rates. The long-run consequences of granting such a waiver request are likely to be the same as granting a uniform reduction in accounting rates. New entrants in the telex market have two possible reasons to seek a lower accounting rate. First, they generally have more outbound traffic than inbound traffic so that a reduction in the accounting rate would benefit them given current traffic patterns. Second, the PTT may agree to allocate an increased share of the return traffic to the new entrant. This will benefit the new entrant since the return traffic is highly profitable even at a reduced accounting rate. This arrangement is also in the PTT's interest since it will reduce the PTT's settlement payments on the traffic reallocated and give the PTT leverage to induce the established carriers to agree to the lower accounting rate (by making credible the threat to send them even less return traffic if they refuse to accept the lower rate).

Third, consider the case of a waiver from the uniform accounting rate requirement in the voice market. Suppose that in order to get an operating

---

17 In the case of telex services the Commission has never granted a waiver request for a deviation from a uniform accounting rate.

agreement from a PTT a new entrant must offer a higher accounting rate than AT&T is paying. If it enters it will charge less than AT&T in order to attract customers. Entry may also induce AT&T to reduce its prices. Thus in the short run, FCC approval of the waiver will benefit consumers. On the other hand, the entry will shift some profits from AT&T to foreign PTTs. This will be true to the extent that entry shifts outbound traffic from AT&T to the new entrant and the new entrant pays the foreign PTT more than it had received from AT&T. But, unlike the record market, there is little danger that permitting such a waiver will enable a PTT to whipsaw the incumbent carriers into accepting less advantageous accounting rates. (See Section IV. C. above).

When the Commission is weighing efficiency benefits (price cuts) with distributional losses (shifting revenues to PTTs) it may also wish to consider the "demonstration effect" on foreign governments of the relative weight it places on efficiency. Placing greater weight on moving prices to cost may put the U.S. on the high moral ground in negotiating with foreign governments for cost-based international telecommunications.

One case in which there is no conflict between reducing prices that U.S. consumers pay and increasing the share of revenues going to U.S. carriers is that of a uniform reduction in the accounting rate in the voice market. A reduction in the accounting rate for all U.S. carriers would both shift revenues to U.S. carriers from PTTs and be likely to reduce prices for U.S.

consumers.

## 2. Bargaining Power of U.S. Carriers

The need for FCC intervention in the setting of accounting rates depends on the bargaining power of U.S. carriers relative to PTTs. If U.S. carriers have sufficient bargaining power there may be little benefit to FCC intervention and under certain circumstances such intervention could be counterproductive. This is likely to be the case in the voice market as long as AT&T maintains its strong market position. It could also be true in the record market if record carriers act collusively in bargaining with PTTs over accounting rates.

Currently, U.S. international carriers are not perfectly competitive, and at least AT&T has sufficient market power to view accounting rates as outcomes of bilateral negotiations with PTTs. When the accounting rate is arrived at in this way, carriers are not likely to treat it as the marginal cost of terminating messages. It is not in the interest of bilateral monopolists to bargain over only the accounting rate and then let each party choose its collection rate taking the accounting rate as fixed. This would be likely to result in both sides setting collection rates above the joint profit maximizing level, and thus have less total profits to share between them.<sup>18</sup> Instead, bilateral monopolists are more likely to determine the

joint profit maximizing collection rates and treat the accounting rate as a mechanism to divide that joint profit. Or they might bargain simultaneously over both the accounting rate and the amount of traffic each carrier will deliver. To maximize the profits available for division between the parties, the PTT would want U.S. carriers to deliver more traffic (and hence charge less) than they would if they took the accounting rate as a fixed per minute price of terminating traffic.

If the FCC or any other governmental body were to impose accounting rates on such bilateral monopolists, the monopolists would be likely to treat the rates as the marginal cost of terminating traffic and wish to charge higher collection rates than if the same accounting rates had been the outcome of a bargaining process. Thus if the current accounting rates were exogenously imposed, AT&T would have the incentive to set collection rates above the present levels. Even with lower accounting rates (or termination charges), such bilateral monopolists might wish to charge more than the current prices, if these lower accounting rates were externally imposed.

This analysis suggests that FCC intervention in setting accounting rates in the voice market could be counterproductive as long as AT&T is able to bargain on an equal basis with PTTs. It could result in higher collection rates, yet it would be unlikely to achieve a more favorable distribution of

---

18 See footnote 4.

revenues between the U.S. and abroad. It might even lead to lower profits for AT&T by inducing PTTs to raise their collection rates thereby reducing the flow of traffic to the U.S. And under traditional rate-of-return regulation, this could compel the Commission to permit AT&T to implement its desired rate increases.

As competition grows, AT&T's bargaining power will decline and there will be a greater potential benefit to FCC involvement in the setting of accounting rates. The above analysis suggests the need to continue regulating AT&T's collection rates during the transition to full competition. As Haring and Kwerel (1987) argue, the best way to do this would be through price caps, based on cost factors not under the control of the firm. To the extent that accounting rates are taken out of the control of AT&T it would be required to pass on reductions in these costs. But as long as accounting rates are the outcome of bargaining between AT&T and PTTs, AT&T should be allowed to keep a portion of the savings it realizes through negotiating more favorable rates, and by the same measure should not be able to pass on the full cost of increases in accounting rates. The analysis also suggests that to the extent that government regulation supplants private bilateral negotiation on accounting rates, the government must also concern itself with foreign collection rates. It would make sense for the U.S. government negotiating with foreign governments over new international access arrangements to negotiate for reductions in international collection rates at the same time the reductions in

international access costs are adopted.

### 3. Predicting the Consequences of Changes in Accounting Rates

Even if U.S. carriers were perfectly competitive, it may be difficult to predict the effect of changes in accounting rates on prices paid by U.S. consumers. The answer may depend on how PTTs allocate return traffic among competing U.S. carriers and on the direction of net traffic flow.

For example, in a competitive international telex market one would expect that reducing the accounting rate would reduce the prices of telex messages originating in the U.S. But this is not always the case. If each minute of outbound traffic generates more than one minute of return traffic, U.S. carriers could in effect receive a subsidy for each minute they originate. Traffic might be linked in this way because PTTs allocate return traffic in proportion to traffic they receive from each U.S. carrier, or because responses to messages are directed via the carrier of the originator of the message because that is the only telex service to which the originator subscribes. In this case a reduction in the accounting rate would reduce the subsidy (per minute of outbound traffic), and thus lead to an increase in the collection rate.

### B. Long-term Strategy to Move Towards Cost-Based Access

To maximize the benefits from competition among U.S. international carriers, the U.S. and its foreign correspondents should develop a long term strategy

to move towards cost-based access to domestic networks. Ideally, foreign countries would adopt a telecommunications policy that parallels U.S. policy -- full facility-based competition for international and domestic interexchange services and cost-based access to local exchanges.

The U.S. cannot assume, however, that its example and exhortations will be sufficient to convince foreign governments to liberalize their international communications policies. As competition increases among U.S. international carriers, it may be appropriate for the U.S. to take more positive steps to move towards cost-based access. These steps could be of the form of greater FCC involvement in the setting of accounting rates or it might be of the form of promoting market rules that would be likely to result in movement towards cost-based international access.

An example of market rules which might promote cost-based access would be to require the unbundling of the international components of facilities from the domestic components, and permit international carriers to terminate traffic on foreign domestic networks on the same terms as domestic users. The usefulness of this approach would depend on the degree to which domestic tariffs are cost-based. It might also require renegotiating various International Telegraph and Telephone Consultative Committee (CCITT) multilateral telecommunications agreements that the U.S. has signed.

The unbundling might be achieved by permitting carriers to purchase "whole" cable circuits (indefeasible rights of use, "IRUs"), and purchase or lease whole satellite circuits. Currently, corresponding carriers each purchase or lease "half circuits." Under this arrangement, every circuit is jointly owned by the corresponding carriers. With such joint ownership, it is natural that part of the accounting rate is intended to compensate the terminating carrier for the use of its share of the international facilities. Under a whole circuit arrangement such compensation would generally not be necessary. A carrier would own or lease the entire international component of the circuits it uses to originate calls. Carriers would purchase or lease circuits based on the level of traffic they expected to originate. (Some mechanism would still be needed to allow use of the correspondents circuits when traffic flows exceed ownership in one direction but not the other.) The price of whole circuits would be cost-based because carriers would be able to purchase cable circuits at cost at the time a cable is built. That is, cable costs are paid in proportion to capacity shares.

Preventing discrimination between international and domestic traffic would require departing from the current settlements arrangements. Under this approach international carriers would be charged domestic rates from certain designated gateways. A major issue this approach raises is the treatment of private lines. Few foreign countries (if any) allow sharing and resale of private line services. But this approach would allow just that for private



lines employed by international carriers. For example, this would be true of the private lines to the designated gateways. At sufficient traffic volumes international carriers could find their costs below domestic toll costs on certain routes. This would give them an incentive to carry such domestic traffic on their leased lines. PTTs who do not favor domestic competition would presumably not wish to create such an opportunity. Thus the entire approach is likely to be adopted only in countries that also wish to liberalize their domestic telecommunications policies.

This same general approach could be applied to international private line service. Telecommunications carriers or private users would be able to purchase whole circuits in international facilities. The domestic portion of the private line rates would be at domestic rates.

It is worth emphasizing that such anti-discrimination provisions would not prevent countries from monopoly pricing of telecommunications. But it would require them to treat international carriers seeking access on the same basis as domestic customers. Since countries are likely to be more concerned about domestic customers than customers seeking access from foreign countries, this constraint would be likely to result in a closer correspondence between cost and the price competitive U.S. carriers pay to terminate messages.

There is a second important caveat. It raises troubling questions about how to make the transition from the current situation to a long-run ideal. As discussed above, greater FCC involvement in establishing accounting rates may not be beneficial if U.S. carriers possess sufficient bargaining power to negotiate on equal terms with PTTs. In that case, imposing accounting rates on carriers could raise collection rates, reduce profits and reduce economic efficiency. If the U.S. government becomes more actively involved in establishing the cost of terminating messages during the transition to full competition, it must also concern itself with the collection rates of carriers with market power including PTTs. It is not enough for the FCC to replace carriers in bargaining over accounting rates (or other forms of termination charges). If it does this, the U.S. government may also need to negotiate with PTTs over collection rates, filling a role played by U.S. carriers prior to the rise in competition.

## VII. SUMMARY AND CONCLUSIONS

This paper discusses the need to consider the impact of growth in competition in international telecommunications on the U.S.'s relationship with foreign telecommunications authorities. Increased competition among U.S. suppliers of international telecommunications services could result in a reduction in the U.S.'s share of the benefits from such services unless the U.S. government takes appropriate action.

The paper develops a simple model of piecemeal competition under the assumption that the FCC permits free entry into the U.S. segment of international telecommunications but plays no role in establishing the terms of the operating agreements U.S. firms negotiate with foreign PTTs. In this theoretical model, promoting competition among U.S. suppliers of international telecommunications may do nothing more than shift profits abroad. Competition for a component of an international telecommunications service will tend to drive the price of that component down to cost. But the price of the total service may remain the same if some other essential component of the service is controlled by a monopolist. The PTTs have a monopoly on access and may be willing to exercise their market power in order to provide revenues to subsidize domestic telephone and postal rates.

Five qualifications to this theoretical conclusion are considered. The essence of the first three qualifications is that competition may increase

economic efficiency. With a "bigger pie" the U.S. may gain even if its share of the pie shrinks. But it is also quite possible that competition may so reduce the U.S. share of the pie that the U.S. ends up with a smaller piece. The fourth qualification concerns the behavior of PTTs. The fifth qualification takes into account the FCC's international settlement policy, which is designed to prevent a PTT from playing competing U.S. carriers off against one another.

The FCC's international settlements policy provides a useful framework to assure that the benefits of international telecommunications are shared equitably between the U.S. and foreign countries. The requirement that accounting rates be divided equally appears to constrain the maximum share of total revenues accruing to either correspondent. This requirement, in conjunction with the requirement that all U.S. carriers have the same accounting rates for similar services on parallel routes, also limits the ability of PTTs to change the current terms for dividing revenues. Without these requirements, PTTs could use their control over return traffic to gain concessions from competing U.S. carriers in the telex market and other markets where there is a net flow of traffic inbound to the U.S.

Unfortunately, establishing "market rules," such as the equal division and uniformity requirements, is not sufficient to assure that accounting rates are in the country's interest. The FCC must often make case by case judgments in implementing its international settlements policy. It must

be able to balance the benefits of reducing prices for U.S. consumers with the cost of shifting revenues from established U.S. carriers to PTTs. For example, in the telex market a reduction in the accounting rate might reduce the rate end-users pay, but also transfer revenue from U.S. carriers to PTTs.

The Commission must also tailor its policy to particular market circumstances. For example, a reduction in the accounting rate will not necessarily result in a reduction in the price end-users pay for telex services. Even if U.S. record carriers act competitively, a reduction in the accounting rate might lead to a rise in the collection rate, if PTTs tend to allocate return traffic in proportion to the amount of traffic originated by individual U.S. carriers. In this case, a reduction in the accounting rate would be unambiguously detrimental to the U.S.

One of the most important market circumstances is the degree of competition among U.S. carriers. When competition is weak, as in the voice market, FCC intervention may be unnecessary or even counterproductive. At present, AT&T has sufficient strength to bargain as an equal with PTTs. The degree of competition in the record market is ambiguous and requires further examination. As competition grows, so does the need for government involvement in regulating accounting rates. The FCC should not, however, limit itself to overseeing accounting rates. During the transition to competition it should continue to regulate AT&T's international collection rates, but it should do so using price caps, not rate of return regulation.

This will give the FCC greater leverage in dealing with PTTs, since it will maintain the FCC's influence over the volume of traffic originating in the U.S. Continuing regulation of collection rates will also prevent collection rates from rising if AT&T begins to view the accounting rate as the marginal cost of terminating messages and not merely as a device for dividing revenues.

Can competition among U.S. carriers be reconciled with PTT monopolies? The FCC's international settlements policy can only partially achieve this end. For the U.S. to fully benefit from competition among U.S. international carriers, foreign countries must themselves decide to liberalize their telecommunications policies. Only with cost-based access to local networks will competition among carriers linking these networks ensure efficient end-to-end prices.

Will this come to pass? Perhaps as countries see themselves losing businesses to countries that have liberalized, they will reconsider their policies. Or, perhaps in their efforts to protect PTT revenues and employment, they will not. But those countries that cling to their traditional ways will be the losers as the countries that see the rewards of efficient pricing forge bilateral agreements and move ahead in this information age.

## References

Averch, Harvey and Leland Johnson. "Behavior of the Firm Under Regulatory Constraint." American Economic Review 52 (December 1962): 1053-1069.

Center for Communications Management. 1986 Eurodata Foundation Yearbook. Ramsey, New Jersey, 1986.

Cornell, Nina, Daniel Kelly, and Peter Greenhalgh. "Social Objectives and Competition in Common Carrier Communications: Incompatible or Inseparable?" U.S. Federal Communications Commission, Office of Plans and Policy, Working Paper No. 1 (April 1980).

Dixit, Avinash. "Vertical Integration in a Monopolistically Competitive Industry." Princeton N.J.: Woodrow Wilson School, Princeton University (1982).

FCC. See U.S. Federal Communications Commission.

Haring, John, and Evan Kwerel. "Competitive Policy in the Post-Equal Access Market." U.S. Federal Communications Commission, Office of Plans and Policy, Working Paper No. 22 (February 1987).

Kelley, Daniel. "Deregulation After Divestiture: The Effect of the AT&T Settlement on Competition." U.S. Federal Communications Commission, Office of Plans and Policy, Working Paper No. 8 (April 1982).

Kwerel, Evan. "Promoting Competition Piecemeal in International Telecommunications." U.S. Federal Communications Commission, Office of Plans and Policy, Working Paper No. 13 (December 1984).

Leibenstein, Harvey. "Allocative Efficiency vs. 'X-Efficiency.'" American Economic Review 56 (June 1966): 392-415.

NTIA. See U.S. Department of Commerce.

Pearce, Alan. "International Telecommunications Service Industry: On the Verge of Massive Structural Change as Competition and Deregulation Threaten the Status Quo." Telecom Insider 3 (May 1983): 5-6.

Perry, Martin and Robert Groff. "Forward Integration by a Monopolist into a Monopolistically Competitive Industry." Bell Laboratories Economic Discussion Paper No. 271 (August 1983).

Posner, Richard. "Taxation by Regulation." Bell Journal of Economics, (Spring 1971): 22-50.



Povich, Laurence. "Considerations in Revising Procedures for Requiring Operating Agreements and Influencing Settlements with Foreign Correspondents." U.S. Federal Communications Commission, Common Carrier Bureau, Memorandum (1980).

Schmalensee, Richard. "A Note on the Theory of Vertical Integration." Journal of Political Economy 81 (March/April 1973): 442-449.

Tarifica, Western Europe Telecommunications Informations Service, Manual, Logica UK Limited, London, UK (1981).

U.S. Code 47, Section 222. Containing the General and Permanent Laws of the United States. Washington: U.S. Government Printing Office, 1981 edition.

U.S. Council of Economic Advisers. Economic Report of the President. Washington: U.S. Government Printing Office, 1987.

U.S. Department of Commerce, National Telecommunications and Information Administration. NTIA Regulatory Alternatives Report (July 1987).

U.S. Federal Communications Commission. "Mackay Radio and Telegraph Co." FCC Reports 2 (1936): 592.

U.S. Federal Communications Commission. "TAT-4 Decision." FCC Reports 37 (1964): 1151.

U.S. Federal Communications Commission. "Uniform Settlements Rates." FCC Reports 84, 2nd ed. (1980): 121.

U.S. Federal Communications Commission. "TAT-4 Revisited." FCC Reports 92, 2nd ed. (1982): 641.

U.S. Federal Communications Commission. "Earth Station Ownership." FCC Reports 97, 2nd ed. (1984): 444.

U.S. Federal Communications Commission. "Uniform Settlements Policy." Report and Order, FCC 86-30; Federal Register 51 (1986): 4736.

U.S. Federal Communications Commission. "Uniform Settlements Policy." Order on Reconsideration, FCC 87-61; Federal Register 52 (1987): 8453.

U.S. Federal Communications Commission. Statistics of Communications Common Carriers, Washington: U.S. Government Printing Office, 1979, 1980, 1981, 1982, 1983, and 1984 editions.

U.S. Federal Communications Commission. "International Communications Traffic Data Report for 1985." Industry Analysis Division, Common Carrier

Bureau (January 1987).

U.S. General Accounting Office. FCC Needs to Monitor a Changing International Telecommunication Market, Washington: U.S. Government Printing Office, March 14, 1983.

U.S. Office of Management and Budget. "Issue Paper on the NORDTEL and Benelux Proposals." (December 8, 1982).

Warren-Boulton, Frederick. "Vertical Control with Variable Proportions." Journal of Political Economy 82 (August/September 1974): 783-804.

Westfield, Fred. "Vertical Integration: Does Product Price Rise or Fall?" American Economic Review 71 (June 1981): 334-346.