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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M St., N. W., Room 222
Washington, DC 20554

Dear Mr. Caton:

Re: Ex Parte Presentation ISP 93013, RM 8355

On Monday, December 20, 1993, Terry Banks, Tom Norris, Merrill Tutton and I met with Commissioner Barrett, Byron Marchant and Jim Colthrop and Commissioner Quello and Lauren Belvin to discuss our comments in the above proceedings and to provide copies of the SPR Study.

Two copies of this Notice were submitted to the Secretary of the FCC in accordance with Section 1.1206 of the Commission's Rules.

Sincerely,

Judy Arenstein

Atts.

cc: Commissioner A. C. Barrett
Commissioner J. H. Quello
L. Belvin
J. Colthrop
B. Marchant

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THE U.S. STAKE IN COMPETITIVE GLOBAL TELECOMMUNICATIONS SERVICES:

THE ECONOMIC CASE FOR TOUGH BARGAINING

STRATEGIC
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RESEARCH

THE U.S. STAKE IN COMPETITIVE GLOBAL TELECOMMUNICATIONS SERVICES:

THE ECONOMIC CASE FOR TOUGH BARGAINING

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DECEMBER 16, 1993

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STRATEGIC
POLICY
RESEARCH

EXECUTIVE SUMMARY

THE U.S. STAKE IN COMPETITIVE GLOBAL TELECOMMUNICATIONS SERVICES:

THE ECONOMIC CASE FOR TOUGH BARGAINING

John Haring
Jeffrey H. Rohlfs
Harry M. Shooshan III

December 16, 1993

Foreign impediments to free trade in international telecommunications services substantially harm the U.S. economy. These impediments take two forms: (1) protectionist restrictions which inhibit competitive expansion by U.S. carriers abroad and afford a method for leveraging foreign monopoly power into the U.S. marketplace; and (2) inflated settlement rates for terminating international calls. The U.S. Government should bargain aggressively to remove those impediments. This study estimates the demand- and supply-side benefits potentially achievable through aggressive bargaining.

Protectionist restrictions on competitive supply by U.S. carriers limit trade in an area in which the U.S. possesses a substantial comparative advantage. This comparative advantage consists of technological leadership, together with marketing skills honed in the competitive U.S. markets for long-distance and value-added services. Currently, most foreign telecommunications markets are closed to competition. The resale of international and domestic long-distance services is usually restricted and the construction of facilities to compete in those markets is usually prohibited. Where competition has been permitted, the incumbent monopoly carrier is generally not required to offer full equal access capabilities to competitors. In contrast, the U.S. markets for international and long-distance services are open. Fully-equal access, including dialing parity, is provided. A variety of structural and nonstructural safeguards are in place to reduce barriers to entry.

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Inflated settlement rates restrict demand by artificially increasing the price of international calling and result in the unwarranted redistribution of very large amounts of money from the U.S. to foreign countries. The amounts paid in excess of actual costs incurred to complete international calls — *currently over $2 billion per year* — are simply subsidies by U.S. customers to foreign carriers — many of which are owned by foreign governments. In 1992, the subsidy paid was equivalent to approximately 35 percent of the total U.S. budget for foreign aid. However, unlike foreign aid programs, a significant part of the subsidy from international telecommunications is paid to industrialized, high-income countries, rather than developing countries.

Elimination of these two types of foreign impediments to free trade would usher in a "Golden Age" in international telecommunications. The market for these services would grow enormously, creating a more cosmopolitan world by improving both economic and personal ties among citizens of different countries. Removal of foreign impediments to free trade would directly stimulate demand for U.S. production of international telecommunications services. This would translate directly into jobs for American workers. Transfers of income from the U.S. to foreign countries would be reduced. These gains in production and income would directly contribute to the U.S. gross domestic product (GDP). The overall U.S. balance of trade would also be enhanced because the subsidies paid to foreign telephone companies would decline substantially, and exports would be stimulated.

A quantitative economic analysis indicates that the potential gains associated with a Golden Age in international telecommunications, over the next 10 years, would add up to:

- Creation of 120,000 to 260,000 new jobs in the U.S. by 2002;
- Cumulative growth of $120 to $210 billion in U.S. GDP; and
- Accumulated improvement of $50 to $60 billion in the U.S. balance of trade.

One cannot realistically expect to achieve *all* these gains through tough bargaining or to achieve them all immediately. However, the gains are so large that achieving even a modest portion of them over time would substantially benefit the U.S. economy.

Currently the largest and most lucrative market in the world, the U.S. relies far less on international trade than most of the major foreign economic powers. This economic strength translates into bargaining leverage *vis-à-vis* other countries. The U.S. also has great bargaining power with regard to trade in telecommunications services, since it is by far the largest telecommunications market in the world. Because the U.S. has these advantages over other countries, it is likely to prevail if it bargains tough. However, once foreign entry is permitted without comparable U.S. access to foreign markets, the U.S. will have lost its

ability to bargain effectively and, in fact, will have created even greater incentives for foreign governments to keep their markets closed and to leverage their market power.

The U.S. Government must demonstrate the fortitude to exploit its considerable bargaining strength to negotiate fair trading arrangements for telecommunications services. The U.S. now pays over $2 billion per year in subsidies to foreign telephone companies, and this figure is growing. *The existence of subsidies of this magnitude, often to prosperous countries, is a trade scandal for which there is no compelling economic policy justification or defense.*

THE U.S. STAKE IN COMPETITIVE GLOBAL TELECOMMUNICATIONS SERVICES:

The Economic Case For Tough Bargaining

John Haring
Jeffrey H. Rohlfs
Harry M. Shooshan III

December 16, 1993

INTRODUCTION

Foreign impediments to free trade in international telecommunications services substantially harm the U.S. economy. These impediments take two forms: (1) anticompetitive protectionist regulation of telecommunications by foreign governments; and (2) excessive settlement rates paid to foreign governments or carriers by U.S. carriers for the completion of international calls by U.S. customers. This study provides a quantitative and qualitative assessment of the gains that would accrue to the U.S. economy if these impediments were abolished; *i.e.*, if foreign markets were fully opened to competition by U.S. telecommunications service providers and settlement rates paid by U.S. carriers to foreign carriers were set at cost. These gains will be lost if U.S. telecommunications policymakers fail to bargain tough to remove foreign protectionist regulations and excessive settlement rates.

Foreign impediments to free trade in telecommunications services cause the U.S. to pay out more than $2 billion per year in subsidy to foreign carriers and governments; deny U.S. customers the full benefits of competition in U.S. international services; and limit the growth of the U.S. economy. In this paper, we show that removing these impediments to free trade would usher in a "Golden Age" of international telecommunications for U.S. and foreign customers. Prices of international services would tumble; demand would grow

enormously; and international facilities would be used far more efficiently. These developments could, over the next ten years:

- Create 120,000 to 260,000 new jobs;
- Add $120 to $210 billion to U.S. gross domestic product (GDP); and
- Improve the overall balance of trade (including services) by $50 to $60 billion.

In addition, the U.S. would reap additional gains that are not quantified here: In particular,

- The U.S. is well-positioned to compete for telecommunications services between and within foreign countries;
- The U.S. could also become a hub for future global intelligent network services;
- U.S. business would benefit from the development of a seamless global network; and
- Competitive pressures would cause foreign carriers to improve the quality of their international networks and thereby allow more U.S. calls to be successfully completed.

Achieving only a modest portion of these gains would be a great boon to the U.S. economy. The nation could get large payoffs in economic value-added and challenging, well-remunerated jobs.

To garner these benefits, U.S. policymakers will have to bargain hard to remove foreign impediments. All of these benefits will be forfeited, if foreign impediments to free trade are permitted to persist. Prospects will be even worse if the U.S. accedes to attempts by foreign telephone companies to enter the U.S. market and does not insist on comparable access for U.S. companies in foreign markets. In that case, the U.S. will lose its bargaining leverage and there will be little or no incentive for foreign telephone companies, or their governments, to remove the restrictions that limit both the supply of and demand for telecommunications services.

I. FOREIGN IMPEDIMENTS TO FREE TRADE IN INTERNATIONAL TELECOMMUNICATIONS SERVICES

A. Supply Restrictions

Almost all foreign countries impose restrictions on the supply of telecommunications services. These restrictions serve to protect the national incumbent carrier. In most foreign markets, laws and regulatory rules prohibit any firm from offering basic services, either within the country or from that country to the rest of the world, in competition with the incumbent national carrier. To the extent any competition is permitted, most countries prohibit any competing carrier from constructing facilities; only resale is permitted, and even then regulatory rules often do not provide adequate safeguards to protect resellers from unreasonable pricing or other anticompetitive actions of the incumbent carrier.

In the few countries where facilities-based competition has been permitted, regulatory rules generally limit the scope of competition. New carriers are often not afforded the competitive safeguards necessary to facilitate effective competition. In particular, no major foreign economic power requires its incumbent carrier to offer its competitors equal access (including dialing parity). Thus, the new entrants must overcome expensive, inferior connections that require customers to dial extra digits and marketing disadvantages that do not attract customers to switch from the incumbent.

Even where a modicum of competition has been permitted, laws and regulatory rules often leave opportunities for the incumbent to use its market power to forestall competition. For example, in the U.K., although the government recently decided to permit facilities-based competition in the provision of U.K. domestic services, it has continued to preserve a duopoly market structure for international services, which permits only one other U.K. firm to compete against BT, the national incumbent. U.K. regulatory rules require the second international carrier and the new domestic entrants to "negotiate" the terms of interconnection to BT's network with BT.

B. Excessive Settlement Rates

A second and significant impediment to free trade in international services is the excessive settlement rates paid to foreign governments or carriers for the completion of international calls made by U.S. customers.[1] Excessive settlement rates inflate the prices of international services and restrict demand. They are a form of subsidy to foreign carriers.[2] Because settlement rates exceed the costs incurred by foreign carriers to complete international calls made by U.S. customers, over $2 billion of U.S. income is siphoned each year to benefit foreign telephone carriers — most of which are government-owned monopolies.[3]

Settlement rates are widely acknowledged to be above cost. In Western European countries, settlement rates[4] for calls from the U.S. range from $0.35 per minute to $1.11 per minute — 2 to 7 times actual costs.[5] The settlement rate to Japan is $0.70 per minute — 3 to

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[1]When a U.S. carrier establishes facility arrangements with a foreign carrier to provide U.S. international service, the parties negotiate an "accounting rate." For each minute of traffic delivered by the originating carrier, the originating carrier is obligated to pay to the terminating carrier one-half of the accounting rate, which is called the "settlement rate." In practice, the payments are netted and the settlement rates are paid only on the imbalance of traffic. Because U.S. carriers usually deliver more traffic to foreign carriers than foreign carriers deliver to the U.S., U.S. carriers usually make net outpayments of settlements to foreign carriers, rather than *vice versa*.

[2]Although the rates are negotiated by the U.S. and foreign carriers, the monopoly position of the foreign carrier leaves little room for negotiation. Despite the efforts of U.S. carriers, settlement rates will all countries remain above costs.

[3]The total net settlement outpayment by U.S. carriers to foreign carriers in 1992, including the true economic costs of terminating international calls, was approximately $3.5 billion.

[4]Settlement rates for calls from the U.S. to Western Europe, Japan and Canada are derived from settlements to foreign carriers divided by minutes. *See* FCC, Industry Analysis Division, Common Carrier Bureau, "Preliminary 1992 Section 43.61 International Telecommunications Data," Table A1, September 1993.

[5]There are very few publicly accepted studies of the costs of terminating international calls in foreign countries. The Office of Technology Assessment (OTA) has concluded that the cost of terminating a call in Germany is no more than $0.15 per minute. [*See* U.S. Congress, OTA, *U.S. Telecommunications Services in European Markets*, OTA-TCT-548 (Washington, D.C.: U.S. Government Printing Office, August 1993, p. 69).] Most of the cost incurred for the termination of a U.S.-Germany call is the cost associated with the German domestic network. Transoceanic cable costs have now declined to approximately $0.04 per minute of calling. The U.S. and German carriers share the cost of the transoceanic facility, so only $0.02 per minute is the cost incurred by the German carrier for the transAtlantic transport.

(continued...)

4 times cost.[6] The settlement rate to Canada is $0.15 per minute, which exceeds costs by over 90 percent.[7] Further, some countries insist on a full rate 24 hours per day, failing to offer economically justified, appropriately discounted off-peak settlement rates.

There is absolutely no justification for this subsidy. The subsidy is a windfall that foreign carriers have received as a result of competition in the U.S. Prior to the advent of competition in the U.S., traffic streams between the U.S. and foreign locations were approximately in balance and settlement rates were set substantially above cost. As competition took hold, substantial price reductions for U.S. interexchange and international calling followed. These lower prices, in turn, stimulated calling by U.S. customers, causing increasing imbalances in the amount of U.S. originated traffic *vis-à-vis* foreign originated traffic to the U.S. The lack of competitive pressures in foreign markets, however, did not create any desire on the part of foreign carriers to reduce their own rates for international calls or the artificially high settlement rates. As a result, foreign carriers began to experience substantial inpayments, as U.S. carriers paid artificially high settlement rates on ever-

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[5](...continued)
The OTA estimate applies to actual costs in a monopoly environment and overestimates the economically efficient costs that would arise in a fully competitive environment. A reasonable surrogate for an economically efficient level of settlement rates would be prices to consumers in the competitive U.S. market for calls between the U.S. mainland and Hawaii. Such calls involve local access charges on each end, transmission costs within the mainland U.S. and submarine fiber optic cables between the U.S. mainland and Hawaii, and profit margins. AT&T's basic tariff rates for such calls range from $0.13 to $0.33 per minute. The corresponding estimate of settlement costs would be half of this price ($0.065 to $0.165) at each end. Numerous discount plans are available with even lower prices.

[6]Longer transoceanic cables are required to complete U.S.-Japan calls, but cable costs are a relatively small part of the total costs incurred to terminate calls. Therefore, there is probably only a few cents per minute difference in costs between U.S.-Germany and U.S.-Japan calls.

[7]The costs to terminate calls in Canada are considerably less than the costs to terminate calls in Germany. The U.S. and Canadian networks are physically integrated and transoceanic cables are not needed. The costs of U.S.-Canada traffic are probably comparable to those of U.S. domestic long-distance traffic. A cost-based settlement rate in that case would be less than $0.08 per minute. This estimate is based on AT&T's price for domestic switched services of $0.16 per minute, which includes access charges that are above cost. (*See* Richard Schmalensee and Jeffrey H. Rohlfs, *Productivity Gains Resulting from Interstate Price Caps for AT&T*, prepared for AT&T, September 3, 1992, for definition of "switched services.") Because the settlement rate should cover only half the cost of the call (which is presumably less than the price of the call), the settlement rate for U.S.-Canada traffic should be no more than $0.08 per minute. In all three regions of the world, these above-cost settlement rates represent discrimination against U.S. carriers.

increasing traffic imbalances. The net U.S. outflow grew from $40 million in 1970[8] to $3.5 billion in 1992. More than $2 billion per year (in excess of costs) of U.S. income now flows from the U.S. to foreign carriers. This subsidy in 1992 represents approximately one-third of the total U.S. budget for foreign aid.[9] But, a significant part of that subsidy is paid to industrialized nations with high standards of living, not to lesser developed or developing nations.

[8]FCC, In the Matter of Regulation of International Accounting Rates, CC Docket No. 90-337, Notice of Proposed Rulemaking, adopted July 12, 1990, released August 7, 1990.

[9]For fiscal year 1992, U.S. foreign aid — *i.e.*, bilateral assistance by the U.S. Agency for International Development (AID) — totaled $6.530 billion. U.S. AID, *FY 1994 AID Congressional Presentation*, Table 2.

II. QUANTIFICATION OF BENEFITS

In this section, we quantify some of the gains to the U.S. economy from removing foreign impediments to free trade in telecommunications services. We project the respective gains in U.S. gross domestic product, employment and overall balance of trade (including services). The projection reflects the potential gains that would accrue by lowering settlement rates to competitive, cost-based rates and abolishing protectionist restrictions *in every foreign country.*[10] The potential gains are so large that achieving only a modest portion of them would be a great boon to the U.S. economy. The gains to U.S. GDP, employment and overall balance of trade each consist of several parts, which we discuss separately and accumulate at the end of the section.

Removing foreign impediments to free trade would directly stimulate demand for U.S. production of telecommunications services between U.S. and foreign locations, and between pairs of foreign locations. This demand stimulation translates into jobs for U.S. workers.

The income of the U.S. would also increase, over and above the gains in production. The nation would pay out less subsidy to foreign carriers for the international telecommunications services it currently consumes, as foreign carriers would be motivated by market forces to reduce their prices. Price reductions by foreign carriers would stimulate new calling, thereby improving the current imbalance of traffic volumes between U.S. and foreign-originated calling. International facilities also would be used more efficiently. The direct gains in production and other gains in income both contribute to the U.S. GDP.

In the macro economy, these direct gains would generate further indirect gains. For example:

- Workers who produce the additional output will earn more income and therefore spend more on consumption. This stimulates the general economy.

[10]There are other, potentially significant gains that would be achieved if competition were effective in foreign markets. These other gains, not quantified here, are discussed in Section III. They include: (a) the offering of end-to-end global seamless services to U.S. customers by multiple U.S. carriers; and (b) higher call completion rates (and U.S. revenues) for calls to international points, as foreign carriers are driven to improve the quality of their networks.

- Firms which produce the additional output will invest more in plant and equipment. This also stimulates the general economy.

The overall U.S. balance of trade would also improve. The subsidy currently paid to foreign telephone carriers would be eliminated, and exports would be stimulated.

All of the above gains are initially estimated for a single year. The effects of removing foreign impediments to free trade in international telecommunications, however, would not be limited to a single year. They would persist indefinitely. Furthermore, they would grow rapidly over time, as international telecommunications is a growth market.

To estimate the long-term effects, we sum the annual impacts over 10 years. Long-term gains are estimated at the end of this section. The estimated long-term gains include all the components discussed in this section.

A. Direct Effect on U.S. GDP of Lowering Settlement Rates

For the purposes of this quantification of benefits, we estimate the level of costs that would be incurred by an efficient carrier operating in a competitive market. We have postulated that the competitive level of costs associated with terminating international telecommunications calls is $0.147 per minute, averaged across all markets. This assumption is based on the estimated cost of approximately $0.08 per minute for calls to/from Canada[11] and $0.15 for calls to Western Europe.[12] For Latin America/Caribbean and Mexico, we have assumed a $0.15 cost, based on the view that, in a competitive market, these countries would experience efficiencies similar to Western Europe.

We assume, again conservatively, that the competitive level of costs for terminating traffic elsewhere in the world averages $0.20 per minute. As compared to Western Europe, this allows a few extra cents per minute for longer cables. That should be more than

[11]See footnote 7.

[12]The OTA study, *op. cit.*, concludes the cost of terminating a call in Germany is no more than $0.15 per minute. In our quantitative analysis, we use that estimate of German costs as a surrogate for Western Europe. See footnote 5 for further discussion of this estimate.

adequate because the average cost of international cables is only $0.02 at each end. A cost of $0.20 per minute also allows a few extra cents per minute for distribution costs within the foreign country. That should also be more than adequate, because many of our large trading partners (*e.g.*, Japan, Taiwan and Singapore, and Hong Kong) have small geographic areas.

We now estimate the direct impact if settlement rates fell to these cost-based levels in all markets. Reducing settlement rates would cause prices for international telecommunications services to decline. Indeed, if effective competition were permitted to develop in foreign markets, prices in both directions would rapidly fall to approximately twice the settlement rate plus an increment to cover the cost of marketing, billing and collection, and bad debts.[13] We estimate the increment to be approximately $0.08 per minute, mostly for customer operations, including marketing and customer service expenses. AT&T's expenses for customer operations amounted to 16.4 percent of revenues in 1992.[14] Applying this ratio to international service revenues, we estimate that customer operations for international calls cost about $0.059 per minute. Billing and collection costs amount to about $0.007 to $0.012 per minute.[15] We add an additional $0.009 to $0.014 per minute to allow for other factors, such as bad debts and fraud. Bad debts and fraud are significant for international calls, but that is largely a consequence of the high price levels. As international prices decline toward the level of domestic prices, the frequencies of bad debts and fraud should also decline toward domestic levels.

It follows from the above assumptions that prices for calls originating in the U.S. would fall an average of 63 percent, down to 37 percent of their current values. Prices for calls terminating in the U.S. would fall an average 88 percent, down to 12 percent of their current values.

The huge price declines would vastly stimulate demand for calls in both directions. To estimate stimulation, we assume a price demand elasticity of -0.5. This assumption is

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[13]We assume that this would be the average price per minute, net of discounts, that would proliferate under effective competition:

[14]FCC Form M, *Annual Report of AT&T Communications to the Federal Communications Commission For the Year Ended December 31, 1992*, pp. 21 and 21.2.

[15]Bridger Mitchell, *Incremental Costs of Telephone Access and Local Use*, July 1990, p. 43.

conservative, based on estimates that AT&T has provided to the FCC in the past. The assumption implies that demand for international services is less elastic than demand for domestic long-distance services. We also did a sensitivity analysis with an assumed price elasticity of -0.8. Under the latter assumption, the elasticity of international calls would be a bit higher than that of domestic long-haul, long-distance calls.[16]

Our estimates of demand stimulation are as follows:

- Demand Elasticity of -0.5:
  - International calls originating in U.S.:
    Demand stimulation: To 160 percent of current level.
  - International calls terminating in U.S.:
    Demand stimulation: To 290 percent of current level.

- Demand Elasticity of -0.8:
  - International calls originating in U.S.:
    Demand stimulation: To 220 percent of current level.
  - International calls terminating in U.S.:
    Demand stimulation: To 550 percent of current level.

These calculations are shown in Table 1.

[16]*See* J. P. Gatto, *et al.*, "Interstate Switched Access Demand Analysis," in *Information Economics and Policy*, Vol. 3, No. 4, 1988, p. 344. Still higher estimates of demand elasticities would *increase* our estimates of the gains from removing foreign impediments to free trade in international telecommunications.

Table 1
Direct Effect of Reduced Settlement Rates on Demand

	U.S. Billed	Foreign Billed	Source/ Comments
	(1)	(2)	(3)
(A) Current Price ($/Minute)	$1.01	$3.05	1992 FCC data
(B) New Price ($/Minute)	$0.37	$0.37	Discussed in text — weighted average of Canada, Europe/ Americas (other than Canada) and rest of world
Elasticity = -0.5			
(C) New Demand (Proportion of Current Demand)	1.64	2.90	[(B)÷(A)]^(-0.5)
Elasticity = -0.8			
(D) New Demand (Proportion of Current Demand)	2.22	5.50	[(B)÷(A)]^(-0.8)

1. Effect on U.S. Production

The additional calls in both directions would be partially produced in the U.S. and partially produced abroad. The additional demand for U.S. production would stimulate the U.S. economy.[17] To estimate the dollar impact on the U.S., we value the additional calls at the new prices, rather than current prices.[18] The new prices are cost-based and more accurately reflect the effect of the additional calls on the real economy.

[17]The price changes additionally affect income transfers from the U.S. abroad. Income transfers are discussed below.

[18]The alternative of evaluating impacts at current prices would lead to *higher* estimates of the gains from removing foreign impediments to free trade in telecommunications.

The direct effect of the additional calls on GDP (value-added in the economy), is the dollar value of the vast increase in demand. To calculate it, we simply multiply the increase in output by the value-added in the U.S. This calculation is shown in Table 2.

Table 2
Direct Effect of Reduced Settlement Rates on U.S. Production

	U.S. Billed	Foreign Billed	Total Traffic	Source/ Comments
	(1)	(2)	(3) (1)+(2)	(4)
(A) Minutes of International Traffic (Billions)	10.224	5.314	15.538	1992 FCC data
(B) U.S. Value-Added per Minute ($/Minute)	$0.23	$0.14	-	Discussed in text — weighted average of Canada, Europe/ Americas (other than Canada) and rest of world
Elasticity = -0.5				
(C) Demand Increase	0.64	1.90	-	See Table 1
(D) Increment to U.S. Production ($ Billions)	$1.505	$1.414	$2.919	(A)x(B)x(C)
Elasticity = -0.8				
(E) Demand Increase	1.22	4.50	-	See Table 1
(F) Increment to U.S. Production ($ Billions)	$2.869	$3.348	$6.217	(A)x(B)x(E)

2. Income Transfers

The decline in the settlement rates would eliminate the subsidy of $2.3 billion per year. The reduction in subsidy constitutes a direct reduction in income transferred from the U.S. abroad. The reduced transfers cause U.S. income to increase. The subsidy is calculated

as current total settlements outpayment ($3.5 billion) less cost-based settlements associated with current traffic ($1.2 billion). The calculation of this subsidy is shown in Table 3.

Table 3
U.S. Subsidy Paid to Foreign Countries

	Canada	Europe & Americas (Other Than Canada)	Rest of World	Total	Source/ Comments
	(1)	(2)	(3)	(4) (1)+(2)+(3)	(5)
(A) Current Settlement Rate ($/Minute)	$0.15	$0.63	$0.89	-	Derived from 1992 FCC data
(B) Cost-Based Settlement Rate ($/Minute)	$0.08	$0.15	$0.20	-	Discussed in text
(C) Minutes of U.S. Billed International Traffic (Billions)	2.226	5.562	2.436	10.224	1992 FCC data
(D) Minutes of Foreign Billed International Traffic (Billions)	1.511	2.625	1.178	5.314	1992 FCC data
(E) Subsidy ($ Billions)	$0.049	$1.419	$0.863	$2.331	[(A)-(B)]x[(C)-(D)]

B. Direct Effect of Global Telecommunications Market on U.S. GDP

If foreign barriers to competition were eliminated, telecommunications could graduate to a truly global market. In that market, the U.S. could provide transport capabilities and value-added functions on many calls that neither originate nor terminate in the U.S. International cables to/from the U.S. could be used during off-peak hours, when the cables have substantial idle capacity. On transAtlantic cables, much of the additional usage could occur during the European morning, before U.S. business hours. The additional usage on the transPacific cables could occur between midnight and 4:00 a.m. in the U.S.

U.S. carriers would be able to make sales relatively easily in a competitive global market. Incremental capacity cost would be close to zero; so carriers could substantially lower prices and still make a profit. In addition, U.S. carriers would be able to offer useful ancillary services and features that are unavailable in many countries.

The amount of such transiting traffic would, however, be limited by the amount of international capacity — facilities that currently exist and those that will be built to handle the increase in traffic to/from the U.S. Building additional international capacity for the express purpose of handling transiting traffic might not be profitable.

We can conservatively assume that the facilities could handle twice their current usage since the incremental usage would occur primarily during off-peak hours. Incremental usage could include both retail (customer) and wholesale (carrier) demand. It would be spread out over several hours, during late night and early morning in the U.S. During all those hours, international facilities could handle the additional transiting traffic and could still have significant idle capacity. Thus, little incremental cost would be associated with the transiting traffic.

It follows from the above assumptions that the amount of transiting traffic would equal approximately half of international traffic that either originates or terminates in the U.S.[19] Additional capacity utilization would equal current capacity utilization. However, transiting traffic requires about twice as much international transmission capacity per unit of traffic. An international facility is used to transport the call from its origin to the U.S. and another international facility is used to transport it to its destination.

The current amount of international traffic that originates or terminates in the U.S. is approximately 16 billion minutes per year. If settlement rates decline, as discussed above, traffic will grow to 30 billion-to-50 billion minutes per year depending on the demand elasticity. (We assume that international capacity will grow as needed to meet the increase in demand.) It follows that approximately 15 to 25 billion additional minutes of transiting traffic could be carried on the facilities (at low incremental cost).

We next need to specify how much U.S. value-added will be provided per minute of hubbed traffic. We estimate that the average U.S. value-added will be roughly $0.05 per

[19]Current transiting traffic is only about 2 percent of the total. It is ignored in this analysis.

minute. On some calls — for example, those between Europe and the Far East — the U.S. would displace foreign ownership of two transoceanic cables. The value-added would exceed $0.10 per minute. On other calls — for example those between the U.K. and the European continent — the U.S. value-added would be much less. The U.S. service would displace only a cable between the U.K. and the Continent. The value of the service would be only $0.01 or $0.02 per minute, in addition to ancillary services provided by the U.S. (*e.g.*, detailed billing or private network features). We use $0.05 a minute as a reasonable rough estimate of the average value of this disparate traffic.

We estimate that roughly half of the $0.05 per minute value-added consists of U.S. production; i.e., switching, transmission, and ancillary services. The remainder consists of additional returns from more efficient utilization of international transmission facilities. The entire amount represents an increase in U.S. income.

We can now estimate the direct effect of this transiting traffic on U.S. GDP. We simply multiply $0.05 by the number of additional transiting minutes. Half of the product is the direct effect on U.S. production; the other half is the direct effect on U.S. income. This calculation is shown in Table 4.

Table 4
Direct Effect of Global Telecommunications Market on U.S. GDP

	Transiting Traffic	Source/ Comments
	(1)	(2)
(A) Minutes of International Traffic (Billions)	7.769	Derived from 1992 FCC data
(B) Value-Added per Minute ($/Minute)	$0.05	Discussed in text
Elasticity = -0.5		
(C) Increment to U.S. GDP ($ Billions)	$0.416	(A)x(B)x(Demand Increase) (See Table 2)
Elasticity = -0.8		
(D) Increment to U.S. GDP ($ Billions)	$0.910	(A)x(B)x(Demand Increase) (See Table 2)

C. Direct Effect on Jobs

The direct effect on jobs derives from increased demand for U.S. production of international telecommunications. The effect of reduced settlement rates on production was discussed in Section A.1 and is shown in Table 2. The effect of increased transiting traffic on U.S. GDP was discussed in Section B and is shown in Table 4. As discussed in that section, approximately half the gain in GDP corresponds to increased production. The increase in production has a direct effect on jobs, while the other gains in income do not.

We use a macroeconomic model to estimate the effect of the increase in production on jobs. In particular, we ran the model and observed that approximately one additional job is created for each $100,000 per year of additional production.[20]

[20]This ratio represents the *marginal* ratio of GDP to jobs. The *average* ratio (i.e., GDP/employment) is much less. The marginal rate is higher, since firms often respond to short-run demand increases by utilizing the (continued...)