ORIGINAL

DOCKET FILE COPY ORIGINAL

AT&T

Judy Simonson
Government Affairs Vice President

Suite 1000
1120 20th Street, N.W.
Washington, DC 20036
202 457-3890
FAX 202 457-2545
PAGER 800 759-8888
PIN 2921102
EMAIL jsimonson@attmail.com

RECEIVED
NOV 19 1997
FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

ERRATUM

November 19, 1997

Ms. Magalie Roman Salas
Secretary
Federal Communications Commission
1919 M Street, NW, Room 222
Washington, DC 20554

Re: Telmex/Sprint Communications, L.L.C. - FCC File No. ITC 97-127
Rules and Policies on Foreign Participation in the U.S.
Telecommunications Market - IB 97-142

Dear Ms. Salas:

Attached hereto is an affidavit by Marius Schwartz, on behalf of AT&T, to be incorporated in the above captioned proceedings. Included are two changes: (1) added missing curriculum vitae as Exhibit 1 and (2) on page 1 changed "declaration" to "affidavit".

Accordingly, an original and two copies of this letter are being submitted to the Secretary of the Federal Communications Commission.

Sincerely,

Judy Simonson

Attachment

No. of Copies rec'd 0+2
List A B C D E

Judy Simonson
Government Affairs Vice President

Suite 1000
1120 20th Street, N.W.
Washington, DC 20036
202 457-3890
FAX 202 457-2545
PAGER 800 759-8888
PIN 2921102
EMAIL jsimonson@attmail.com

RECEIVED
NOV 18 1997
FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

November 18, 1997

Ms. Magalie Roman Salas
Secretary
Federal Communications Commission
1919 M Street, NW, Room 222
Washington, DC 20554

Re: Telmex/Sprint Communications, L.L.C. - FCC File No. ITC 97-127
Rules and Policies on Foreign Participation in the U.S. Telecommunications Market - IB 97-142

Dear Ms. Salas:

Attached hereto is an affidavit by Marius Schwartz, on behalf of AT&T, to be incorporated in the above captioned proceedings.

Accordingly, an original and two copies of this letter are being submitted to the Secretary of the Federal Communications Commission.

Sincerely,

Judy Simonson

Attachment

COMPETITIVE CONCERNS WITH MANIPULATION OF THE INTERNATIONAL SETTLEMENTS PROCESS UNDER ASYMMETRIC LIBERALIZATION AND ABOVE-COST SETTLEMENT RATES

by

MARIUS SCHWARTZ

November 18, 1997

Affidavit on behalf of AT&T:

Rules and Policies on Foreign Participation in the U.S. Telecommunications Market

IB 97-142

Professional Qualifications and Purpose of Submission

My name is Marius Schwartz. I am a Professor of Economics at Georgetown University. I received my B.Sc. degree with first-class honors from the London School of Economics and my Ph.D. in economics from the University of California at Los Angeles. My areas of teaching and research are industrial organization, antitrust and regulation.

From April 1995 to June 1996, I was the senior staff economist at the President's Council of Economic Advisers (CEA) responsible for antitrust and regulated industries. In that capacity I participated in the development of the Administration's policy leading up to the enactment of the 1996 Telecommunications Act, and also worked on several matters in international telecommunications. Since 1980, I have served intermittently as a consultant to the Antitrust Division of the Department of Justice on a variety of competition matters. I recently submitted an affidavit to this Commission supporting the Department's evaluations of the applications by SBC to provide interLATA services in Oklahoma (May 14, 1997), by Ameritech in Michigan (June 25, 1997) and by BellSouth in South Carolina (November 3, 1997), and a supplemental affidavit in connection with the BellSouth application. I have also consulted for international agencies, and private companies. My curriculum vitae is attached as Exhibit 1.

This affidavit addresses competitive concerns posed by entry into the U.S. IMTS market by dominant foreign carriers, in particular, the dangers that such entry can exacerbate gaming of the International Settlements Process—to the significant detriment of both U.S. carriers and U.S. consumers. Preliminary calculations suggest that, if the behavior in question is not adequately prevented, the potential harm to the U.S. could run in the hundreds of millions of dollars annually.

I. OVERVIEW

Efforts to liberalize world telecommunications markets, as exemplified by the WTO Agreement on Basic Telecom Services concluded February 1997, hold tremendous promise for increasing competition and economic welfare in the U.S. and worldwide. But the process will be neither easy nor instantaneous. If U.S. experience with the Telecom Act is any guide, considerable implementation difficulties lie ahead even in countries that have committed to open their markets to competition. Moreover, certain WTO countries have not even made adequate such commitments. Thus, the transition to a global regime that relies primarily on competition rather than monopoly will witness a very different pace of liberalization across countries.

Such asymmetric liberalization poses potentially serious competitive risks to the U.S. and other countries whose domestic markets are already more competitive, if they allow participation in their markets by foreign dominant carriers without adequate safeguards. Entry by a dominant foreign carrier, possibly through a strategic alliance with a U.S. carrier, has been viewed as desirable by the Commission, on the belief that it would stimulate competition in an imperfectly competitive U.S. market. But there is also a real danger that such entry, instead, could reduce competition and harm consumers—by enhancing the foreign carrier's ability to manipulate the International Settlements Process (ISP) through schemes such as call turnaround or re-originating calls through the U.S. (in ways that U.S. carriers cannot match abroad, due to the less open foreign market). Thus, foreign entry should be encouraged, but subject to safeguards that are adequate to address the risks to competition posed by such gaming.

Perhaps the main reason cited for why entry by a dominant foreign carrier would benefit consumers is the so-called "reduction of double marginalization." The standard version of this argument (not incorporating the special features introduced by proportionate return, discussed later) rests on two premises: (a) the foreign termination

charge ("settlement" rates) is well above cost; and (b) the U.S. IMTS market is only imperfectly competitive, and U.S. IMTS prices permit supra-competitive profits. The foreign entrant would then have stronger incentives than would other entrants to reduce U.S. prices for traffic to its home country in order to increase calling, because expanded calling increases its profit from foreign termination—an effect not captured by carriers that do not similarly earn any margins on terminating calls in the foreign market.

However, even if the above view of the foreign carrier's incentives is correct as far as it goes, it overlooks another powerful incentive: to use U.S. entry for purposes of manipulating the ISP in favor of the dominant foreign carrier. This paper shows that such manipulation can increase the total termination payments (settlements) made by U.S. carriers to the foreign carrier *for a given number of outbound minutes* they send, thereby shifting profits to the foreign carrier from U.S. carriers that are not part of an alliance with the foreign carrier ("non-alliance" or "other" carriers).

Increasing settlement payments through such manipulation raises the average cost of any non-alliance U.S. carrier of sending calls from the U.S. Moreover, it also *raises the marginal cost* of all non-alliance carriers (with the rare possible exception of the largest carrier and, if manipulation is great enough, that carrier's marginal cost also necessarily rises). The increase in carriers' marginal costs, in turn, puts upward pressure on prices, an effect that would *harm also U.S. consumers*. Thus, gaming the ISP is a form of raising rivals' costs (RRC) by the dominant foreign carrier—but with a pernicious twist: whereas RRC strategies are typically subject to the criticism that they entail actions costly to the perpetrator, here these actions enhance the perpetrator's revenue!

In short, even if entry by a dominant foreign carrier has the *potential* to benefit U.S. consumers by lowering prices to reduce "double marginalization," this beneficial effect can easily be swamped by the negative effects on U.S. carriers and consumers from manipulating the ISP, manipulation that is facilitated by permitting foreign entry without

adequate safeguards. Indeed, unlike the incentive to enter for purposes of reducing "double marginalization," which hinges on the U.S. market being significantly far from perfect competition, incentives to enter in order to game the ISP exist if the U.S. market is substantially competitive.

Moreover, we do not have to choose between (a) allowing foreign entry and risking the harm from gaming of the ISP, or (b) denying such entry and foregoing whatever potential benefits from alleviation of "double marginalization" a foreign entrant may bring about by increasing competition in the U.S. retail market. It is possible to devise safeguards that preserve any beneficial potential of entry while limiting the risks.

While the FCC has recognized the potential problem from gaming of the ISP, the measures proposed in its *Foreign Participation NPRM* and the steps taken in its *International Settlements Order* do not go far enough. In particular, there is insufficient recognition of the fact that gaming the ISP does not require facilities-based entry by the foreign carrier; it can be accomplished through cooperation with a U.S. facilities based carrier—including through switched resale. Stronger safeguards are therefore needed. Preliminary calculations indicate that if adequate safeguards are not adopted, the potential costs to U.S. carriers and consumers run in the hundreds of millions of dollars annually.

A. International Telecommunications Services Raise Special Concerns

Unlike most goods or services, in the case of international telecommunications competition in the U.S. alone is not sufficient to deliver to U.S. users the usual benefits one can expect from domestic competition. International telecommunications, however, by definition require a link also at the foreign end in order to generate a useful service. Competition at U.S. end, by driving down the cost of providing the U.S. link, leaves more that can be potentially extracted by a dominant foreign carrier exploiting its bottleneck input(s), such as foreign termination. Thus, competition in the U.S. cannot deliver

significant benefits to U.S. consumers if a dominant foreign carrier appropriates the gains by raising its prices for vital inputs, notably its settlement rates for call termination.

Preventing such an outcome requires one of two policy responses: (a) introducing competition also at the foreign end, or (b) adopting safeguards against foreign abuses pending the emergence of competition. The FCC, of course, has long recognized the dangers posed by dominant foreign operators. Its *proportionate return* rules, that allocate credit for U.S. inbound minutes from a foreign country in proportion to U.S. carriers' outbound minutes to that country, were adopted precisely in order to prevent dominant foreign carriers from playing off competitive U.S. carriers against each other (whipsawing). Proportionate return and other regulatory measures, however, can themselves be distorting (as shown in Section II.A), and the long run goal should be to obviate the need for such regulations by promoting foreign competition or otherwise bringing settlement rates to economic cost. But during the transition to competition, interim safeguards will be necessary. In particular, safeguards are needed to prevent dominant foreign carriers from manipulating traffic flows so as to deny U.S. carriers credits for inbound minutes which U.S. carriers use to reduce their outbound settlement payments under today's ISP. Such gaming incentives are especially strong given that settlement rates are substantially above costs.

B. Stronger Safeguards Are Necessary

In its *International Settlements Order* the FCC moved to cap settlement rates, by reducing them over time towards stipulated benchmark levels. It justified this policy on grounds of directly benefiting U.S. consumers, as well as reducing the risks of anti-competitive pricing in the U.S. market against U.S. carriers by foreign carriers that otherwise can charge a high termination price to U.S. carriers (but treat any such charges to itself or an affiliate as merely a transfer price).

The FCC also expressed concern about another class of potentially anti-competitive behavior: opportunities available to foreign carriers but not to U.S. carriers, due to the greater openness of the U.S. market, to bypass the ISP. Lowering settlement rates towards benchmark levels, as proposed in the Order, would reduce both the profitability of and the harm from such a strategy. The Order proposes additional safeguards against bypass, in particular, against International Simple Resale—routing traffic into the U.S. through private lines to avoid such traffic from being counted for settlement purposes, then completing of such traffic through the U.S. public switched network. However, the proposed safeguards are insufficient.

Section II below explains the great incentive and scope for gaming the ISP through practices such as "call turnaround" and "carrier re-origination." To date, such practices have largely involved *customers arbitraging differences in retail prices* between foreign countries and the U.S. (prompting call back and other types of call turn-around); or *differences in settlement rates* that a foreign country charges for terminating traffic from various countries and that do not reflect differences in the costs of terminating such traffic (prompting call re-origination or other forms of "least cost routing"). Foreign carriers harmed by such forms of arbitrage have naturally opposed them, while the FCC has correctly advocated them as pro-consumer. However, when a dominant foreign carrier participates in the U.S. retail market, it can engage in such schemes not for reasons of arbitrage—indeed, the logic does not hinge on price differences—but rather to increase the payments U.S. carriers must make to terminate calls in the foreign country. As such, the effect will be to harm U.S. carriers and U.S. consumers.

Section III argues that the scope for such behavior is substantially the same whether a foreign carrier participates in the U.S. market as "facilities based" or by reselling the services of another facilities based carrier. The key issue is whether the entering foreign carrier: controls significant bottlenecks in its own country, not the

particular entry mode it selects for the U.S. market. Indeed, adoption of markedly weaker safeguards against resale would leave intact anti-competitive dangers, but merely bias foreign carriers towards opting for resale, when facilities-based entry might otherwise be economically more efficient.

II. GAMING THE INTERNATIONAL SETTLEMENTS PROCESS

Two features of the ISP in the U.S. are critical for understanding the scope for abuse. (1) Total settlement payments made by U.S. carriers to a foreign country are computed by multiplying the settlement rate by the *difference* between total U.S. outbound minutes to the country and total inbound minutes from that country to the U.S. (2) Under the FCC's proportionate return policy, an individual carrier's credit for "inbound minutes" is purely an accounting construct computed by multiplying total U.S. inbound minutes by that carrier's market share of all U.S. outbound minutes.[1]

A. Dominant Foreign Carrier Aims to Decrease U.S. Carriers' Credits for Inbound Minutes and thus Increase their Payments for Outbound Minutes

Suppose that a dominant foreign carrier enters the U.S. market and is able to originate calls from the U.S. to its home country. Entry could be through new facilities; through acquiring a U.S. facilities-based carrier or affiliating with such a carrier; or through an affiliation with an entity that itself is affiliated with a U.S. facilities-based carrier.[2]

---

[1] See, for example, Douglas Galbi, "An Economic Model of International Interconnection," paper presented at the 25th Annual Telecommunications Policy Research Conference, Washington DC, September 27-29, 1997. Galbi's paper, like the analysis presented here, stresses the incentives of carriers to bypass the ISP and notes the risks from asymmetric liberalization. However, he focuses on somewhat different issues, e.g., bypass by routing traffic through private lines, not on the additional scope for gaming created when a dominant foreign carrier is allowed to operate in the retail market of the liberalized country, which is the focus of my analysis.

[2] For example, in the Sprint-Telmex joint venture recently authorized by the FCC to operate in the U.S., subsidiaries of Sprint and Telmex each own a 50% share in an entity

Possible differences between these entry modes are discussed later. For the moment, consider the incentives of the foreign carrier and its U.S. "ally," call it carrier A, assuming that their objective is to maximize their combined profit. This assumption clearly is appropriate for integrated entry, but I will argue that it is also reasonable for the other entry modes. (Also, it is harmless to frame the issue as the foreign carrier forming an alliance with an existing U.S. carrier, since the case where the foreign carrier enters through its own new facilities can be analyzed as one where its U.S. "ally" initially has a zero market share of U.S. outbound minutes.)

The incentives and ways to game the ISP can be understood by examining the expression below. Denote by T the total settlement payments initially made by all U.S. carriers that are not part of the alliance ("other carriers"), that is, all but carrier A. Then

$$T = r(n - N_i s) = r[n - N_i(n/(n + a))] = rn(1 - N_i/N_O),$$

where: r is the settlement rate per minute (half the "accounting rate"); n is the number of outbound minutes of all non-alliance carriers ("other carriers") to the foreign country; N_i is the total number of inbound minutes from the foreign country; s is the collective market share of outbound minutes of all other carriers (hence A's share is 1-s); a is number of outbound minutes of alliance carrier A; and N_O is the total number of outbound minutes. Thus, total termination payments made by U.S. carriers outside the alliance are equal to the settlement rate (r) multiplied by the difference between these carriers' outbound minutes (n) and their credit for inbound minutes ($N_i s$). If r and n remain constant, T will increase if either N_i decreases (there are fewer total U.S. inbound minutes) or s decreases (other carriers' allocated share of outbound and hence also of inbound minutes falls).[3]

(Telmex/Sprint Communications) that resells services of the facilities-based carrier Sprint.

[3] Equivalently, for a given number of outbound minutes of non-alliance carriers (n), their outpayments increase if the *ratio* of inbound to outbound minutes (N_i/N_O) falls. This can arise from a decrease in inbound minutes or an increase in outbound minutes (a) of the alliance carrier, since $N_O = n + a$, so increasing N_O while holding n fixed entails increasing a.

Thus, the alliance will have incentives to reduce N_i and s in order to increase settlement payments made by all other U.S. carriers. (Of course, the number of minutes *will* change in equilibrium, but the ensuing analysis indicates what changes to expect. Moreover, as noted in II.F below, if minutes do decline, this effect harms consumers.)

The alliance can increase other carriers' settlement payments—*without sacrificing its own retail revenue*—through two basic strategies:

(a) *Call Inflation*—Dilute other carriers' credited share (s) of inbound minutes by artificially inflating the alliance's outbound minutes and hence its own share of inbound minutes (recall that a carrier's credited share of inbound minutes equals its recorded share of outbound minutes). This can be done by over-reporting outbound minutes, or through *call re-origination*— re-routing through the U.S. traffic destined to the foreign market from a third country. I use the term "call inflation" to denote such strategies because in my examples the additional outbound minutes recorded by the alliance carrier are *not useful genuine minutes* to consumers. (The alliance can also gain by stimulating useful minutes through cutting its retail price, in which case some of the alliance's gain still comes at the expense of non-alliance carriers through diluting their market share and hence credits for inbound minutes, but consumers then can also benefit. I focus here on pure manipulation strategies, to make the point sharply that they can be profitable without delivering gains to consumers.)

(b) *Call Turnaround*—Reduce inbound minutes (N_i) without losing retail revenue, by converting these minutes into outbound minutes sent by the alliance through call turnaround schemes. Actually, call turnaround not only reduces inbound minutes but also inflates the alliance's outbound minutes; it thereby also dilutes others' share of the remaining inbound minutes, as under pure "call inflation."

The profitability of "call inflation" hinges on the use of proportionate return rules for allocating inbound minutes. However, call turnaround can be profitable under considerably more general conditions, as will become apparent.

Before explaining the workings of these strategies, it is important to appreciate the harm they would cause. By reducing the credits for incoming minutes available to all other U.S. carriers, the alliance will increase the termination payments received from such carriers for the same number of outbound minutes. The effect of this is to raise the average cost of termination for U.S. carriers and reduce their profit.

However, the harm is not confined to U.S. carriers—this is not a situation where the loss to U.S. carriers is outweighed by gains to U.S. consumers as a result of lower retail prices. Rather, consumers are also likely to be harmed, because retail prices to U.S. consumers are likely to *rise*. This is because reducing U.S. carriers' credit for inbound minutes (sN_i) will raise both the average cost to all other U.S. carriers of terminating calls abroad, as well as their *marginal* costs (with the possible rare exception of the largest carrier, as explained shortly). Since retail pricing decisions depend on marginal cost—the incremental cost a carrier incurs if it sends another outbound minute—raising marginal costs (by reducing incoming credits) will put upward pressure on carriers' retail prices.

To see these effects, consider the expressions for the Average Cost of termination per minute (AC) incurred by any *individual* U.S. carrier, and its Marginal Cost (MC) of termination. These expressions are obtained from the earlier formula for T by interpreting T to mean the total payments of a particular carrier rather than all non-alliance carriers, and n to mean only that carrier's outbound minutes. Thus,

$$AC = T/n = r(1 - N_i/N_o)$$

where: r is the settlement rate; N_i is the total number of inbound minutes into the U.S. from that country; and N_o is the total number of outbound minutes to that country (we assume here that N_o is larger than N_i). The *marginal* termination cost (MC) of sending

an additional outbound minute, by a U.S. carrier whose initial share of total U.S. outbound minutes is x, can be expressed as:

$$MC = \partial T/\partial n = r[1 - (N_i/N_O)(1-x)].$$

These expressions show that both the average cost and the marginal cost (to any carrier) increase as the ratio of inbound to outbound minutes (N_i/N_O) decreases. In the limiting case where there are no incoming minutes ($N_i = 0$), both the average and marginal costs are simply r, the settlement rate, because there is no inbound traffic to credit against the outbound minutes.[4] The same tendency arises if, instead, the foreign carrier causes N_o to increase dramatically by inflating its own U.S. outbound minutes (in ways discussed shortly). In that case, the number of inbound minutes remain unchanged, but the alliance's inflated share of outbound minutes gives it the lion's share of credits for inbound minutes, thereby denying credits to others.[5]

---

[4] Interestingly, the marginal cost is also r if initially there is only a single carrier in the U.S., with market share therefore of x = 1. More generally, a carrier's marginal cost is closer to r the greater is that carrier's initial market share. The intuition is subtle, and hinges on the proportionate return system for allocating credits of inbound traffic: the larger is a carrier's initial share x, the smaller of an increase in its market share will be achieved by sending an additional minute, hence the smaller the increase in its inbound credits from the fixed pool of inbound minutes. For example, a monopolist carrier (x=1) already is claiming all the inbound minutes as credits hence sending an additional minute increases its costs by the full settlement rate, because it cannot increase its share of inbound minutes above the initial and maximal level of 1.

[5] It is theoretically possible that the marginal cost of the largest carrier can fall due to call inflation or (less likely) call turnaround. The reason is that these practices reduce the market shares of all non-alliance carriers and, in so doing, would reduce the marginal cost of a carrier *for a fixed ratio of the total inbound/inbound minutes*, since a smaller carrier also has a lower marginal cost, as shown by the expression for MC. Thus, these schemes have two opposing effects on MC, as can be seen from the expression $MC = r[1 - (N_i/N_O)(1 - x)]$: (1) Both schemes *reduce the ratio N_i/N_O* (call inflation does so only by raising N_O through increasing the alliance's outbound minutes; turnaround does this and reduces N_i by the same amount as the increase in the alliance's outbound minutes). (2) But both schemes also reduce x, the non-alliance carrier's market share. It should be clear, however, that, for any x, effect (1) will dominate if the deterioration in the ratio is sufficiently great.

Moreover, it can be shown that call inflation will reduce a carrier's marginal cost *if and only if* the sum of that carrier's market shares before and after the "inflation" ($x + x^*$) exceeds 1. This result has the following implications: (a) At best, only the largest carrier's

Thus, today's proportionate return system, that is designed to guard against the dangers of asymmetrically greater market power on the foreign end and settlement rates that are prices well above costs, unfortunately is vulnerable to manipulation. Beyond this shortcoming, the expressions for AC and MC reveal two distortions that proportionate return creates.

First, for any carrier, I whose marke share is s_i, the perceived marginal cost of terminating outbound traffic, $MC_i = r[1 - (N_i/N_O)(1 - s_i)]$, increases, even if—as is likely—the true marginal cost of providing foreign termination is constant. MC_i increases as a carrier increases its outbound minutes, for two reasons. (1) The ratio (N_i/N_O) deteriorates (unless other carriers reduce their minutes by at least as much as the initial carrier expands). (2) The carrier's own market share s_i increases (assuming that other carriers do not increase their own minutes proportionately.) The increase in the carrier's share means that it becomes "increasingly difficult" for that carrier to increase its credits for inbound minutes as it continues to expand outbound minutes, for reasons explained in footnote 4. The inefficiency created by an artificially increasing MC is that it discourages U.S. carriers from stimulating increased outbound minutes.

Second, the current proportionate return system penalizes more efficient carriers. A carrier that has a higher market share (higher s_i), reflecting presumably either lower non-

---

marginal cost will fall, while marginal costs of all others will rise. This is because any non-alliance carrier's share will be lower after the inflation, hence if its initial share is less than 1/2, so is its new share, implying that the sum is less than 1. (b) If the largest carrier itself has initial share less than 1/2 (i.e., below 50%), then its marginal cost too will rise (because its initial and new share will then necessarily add up to less than 1). The conditions under which call turnaround will lower the marginal cost of the largest carrier are even more stringent, because call turnaround combines call inflation (whose effect was discussed) and a reduction in inbound minutes (whose unambiguous effect is to raise marginal costs). I have performed simulations showing that when the largest carrier's marginal cost does fall it does so only slightly (Figure 6 illustrates such a case for AT&T), while others' carriers marginal costs shift up considerably; and that for realistic parameter configurations, *all* marginal costs shift up considerably. For all these reasons, the surprising theoretical possibility that the largest carrier's marginal cost might fall should provide little solace to policy makers in practice.

termination costs or demand advantages in the eyes of consumers, also has a higher perceived marginal cost of termination: $MC_i = r[1 - (N_i/N_O)(1 - s_i)]$, which increases with s_i. The logic once again is that of footnote 4: a carrier encounters "diminishing returns" in increasing its share of inbound minutes as its share of outbound minutes rises. Thus, a smaller carrier has lower marginal cost, because a given increase in its number of outbound minutes raises its credits for inbound minutes by more than the same increase raises the credits for a larger carrier. This artificial disparity distorts market outcomes. Letting all carriers face the same marginal cost of termination would introduce competitive neutrality and allow market outcomes to be determined by competitors' relative efficiencies.

Returning to the incentives of the dominant foreign carrier and its U.S. ally, the alliance gains by manipulating the ISP instead of allowing normal directions of calling patterns to determine settlements payments. These gains come at the expense of other U.S. carriers, as well as U.S. consumers. And, for a given number of initial credit for inbound minutes that can be potentially reduced through gaming, the incentives to engage in such behavior are greater, the higher is the initial settlement rate. For this reason, a policy of reducing the settlement rate as a condition for approving entry not only is justified based on directly enhancing consumer welfare in the absence of any gaming, but also on grounds of reducing the incentive for such harmful gaming. I next discuss the workings of such anti-competitive gaming strategies in greater detail.

B. Reducing U.S. Inbound Minutes through Affiliate Call Turnaround

Suppose the alliance succeeds in turning around a call of t minutes originally going from the foreign country to the subscriber of any U.S. carrier (including possibly its own U.S. alliance partner, carrier A) into a U.S. outbound call of t minutes carried by carrier A. This turnaround increases A's market share of outbound calls and therefore reduces other carriers' total share from its initial level s to a lower level s*. Settlement payments made

by *all other U.S. carriers* (for a given number of outbound minutes) increase from T to T* by an amount L (for "*loss*"), which is equal to the reduction in credits for inbound minutes. This amount can be shown to be:

$$L = T^* - T = (rts) + r(s - s^*)(N_i - t), \quad \text{where } s > s^*.$$

(As an aside, it can be shown that the term L is linear in the *share* of initial inbound minutes that is turned around, t/N_i.) The term (rts) reflects the loss to U.S. carriers from the reduced inbound minutes. There are t fewer inbound minutes, and other carriers' initial market share of outbound minutes and therefore also of inbound minutes was s, hence these other carriers experience a reduction in their credits of st. They must make settlement payments on st additional outbound minutes and must pay the settlement rate r for each such minute, for a total additional outpayment of rts.

The second term of L is $r(s - s^*)(N_i - t)$. It reflects the decrease in other U.S. carriers' share of the remaining inbound minutes ($N_i - t$), due to the *dilution* in their total market share of outbound minutes (and hence share of credit for inbound minutes) from s to s*, resulting from the alliance's inflation of its own outbound minutes by t resulting from the call turnaround. This term hinges on the proportionate return system for allocating credits for inbound minutes. (For this reason, the profitability of any pure call inflation strategies, whose purpose is to dilute others' market share, hinges on the use of a proportionate return system.)

However, the term rts does not hinge on proportionate return; it reflects the fact that reduced inbound minutes to the U.S. simply reduce a foreign carrier's outpayments. Thus, call turnaround, by reversing the direction of traffic, can be profitable to the foreign carrier and its U.S. ally even absent a proportionate return system in the U.S. Suppose that the *true marginal cost* of terminating a call in the foreign country is c, while the settlement rate charged by U.S. carriers is r and r exceeds c. (Today, for most countries the U.S. rate is the same as the foreign rate.) Then call turnaround of 1 minute by the

foreign carrier would reduce its payment to the U.S. carrier by r while increasing its costs by c, the marginal cost of termination abroad. Thus, the foreign carrier gains r - c. In the absence of a proportionate return system, this is the entire gain (with proportionate return, there is also a gain from diluting non-alliance carriers' share of remaining inbound minutes.) As long as the retail revenue to the alliance does not fall by more than (r - c) as a result of the turnaround, the scheme is profitable.

Finally, and somewhat surprisingly, under a proportionate return system call turnaround can be profitable even if the settlement rate is at or even below the foreign marginal cost of termination, c. If the foreign carrier turns around t minutes, then the increased payments by U.S. carriers for an unchanged number of outbound minutes was shown to be: $L = T^* - T = (rts) + r(s - s^*)(N_i - t), s > s^*$. The increased termination cost to the foreign carrier from reversing the call direction is tc. Therefore the alliance's increased profit is simply:

$$L - tc = t(rs - c) + r(s - s^*)(N_i - t).$$

Suppose the settlement rate equals true marginal cost: r = c. Then t(rs - c) = tc(s - 1) which is negative, but becomes arbitrarily small as s approaches 1 (i.e., as the alliance's *initial* market share, 1-s, approaches 0). The second term above is $r(s - s^*)(N_i - t)$, which is positive. Clearly, this positive second term will outweigh the negative first term if s is sufficiently close to 1.[6] The intuition is that the call turnaround has the added impact of diluting non-alliance carriers' share of credits for inbound minutes, thereby forcing them to pay more for the given number of outbound minutes they send. Even if the settlement rate on such minutes were c, the foreign marginal cost, the increased payments induced by the turnaround could make turnaround profitable for the alliance under the conditions described above.

---

[6] Interestingly, although the profitability of call turnaround in the case of r = c hinges on the added impact of call inflation, call inflation by itself (discussed in the ensuing Section II.C) cannot be profitable when r = c.

Section II.F below provides some illustrative calculations of the potential effects of call turnaround (and of pure call inflation) on outpayments by non-alliance U.S. carriers, showing that the potential harm—as measured by the term L—runs in the hundreds of millions of dollars. Observe that L reflects the increased payments made by *non-alliance* U.S. carriers.

The question has been raised whether the alliance's U.S. partner (carrier A) would be willing to go along with such a scheme, given that—unless compensated by the foreign carrier—it too would lose from a drop in U.S. inbound minutes. This is not an issue where the foreign carrier owns the U.S. facilities used to effect the call turnaround, because profits then accrue to common shareholders. However, as explained next, the same gaming can occur also where the foreign entry into the U.S. market is not "facilities-based," but instead entails *resale* of the services of a willing U.S. facilities-based carrier.

Affiliation can help to align interests. Suppose the alliance takes the form of a U.S. affiliate jointly owned by the foreign carrier and a U.S. facilities-based carrier, and the affiliate resells the services of the parent U.S. carrier. For example, the Telmex/Sprint U.S. joint venture recently approved by the FCC is owned 50/50 by wholly owned subsidiaries of each carrier. The U.S. partner of a foreign carrier, call it Sprint (purely for concreteness rather than to single out Sprint) stands to lose only because of the reduction in U.S. inbound minutes. Its loss from this effect, in the earlier example where t minutes are turned around, is rt(1-s): its original share of outbound minutes is (1 - s), since s is the total share of non-alliance carriers; hence the reduction in U.S. inbound traffic by t minutes reduces Sprint's credits by t(1-s), thereby increasing its outpayments by rt(1-s). Telmex's increased termination revenues from the turnaround were simply rt.[7] Telmex can therefore make Sprint whole by compensating it an amount rt(1-s).

---

[7] The net increased termination payment made by U.S. carriers outside the alliance (i.e., other than Sprint), and hence the *net* gain to the alliance, is $L = rts + r(s - s^*)(N_i - t)$. The term rts already reflects the fact that reducing U.S. inbound minutes by t caused Sprint to lose rt(1-s): the gain to Telmex alone was rt, hence the alliance's net gain is rts = rt - rt(1-s).

A relevant question is whether such compensation would require offsetting payments from Telmex to Sprint and, if so, whether the presence of an affiliate relationship might help. Suppose that the joint venture (STC) pays Sprint for carrying the additional t outbound minutes that are turned around a wholesale price equal to Sprint's new (and increased) marginal cost computed at Sprint's new volume. Then Sprint finds the arrangement lucrative provided its initial market share, (1-s), was sufficiently low: as (1-s) becomes close to 0, Sprint's loss rt(1-s) from the reduction in credits to all U.S. carriers from a reduced inbound minute becomes close to 0—because Sprint was not sharing in such credits in the first place. Note that MC increases as Sprint sends out more minutes (for reasons explained earlier), and this MC exceeds its average cost AC. Therefore, paying Sprint a price for outbound transport equal to its higher marginal cost (evaluated at its post-turnaround volume) would suffice to offset its loss if its initial market share was sufficiently small.

However, paying it only this price would *not* suffice to compensate Sprint if its initial share was sufficiently large. In such a case, its loss from reduced inbound minutes, rt(1-s), is relatively large while its potential gain from increasing its share of credits from the remaining pool of inbound minutes is small; this is because of the "diminishing returns" property explained earlier. (To see that this has to hold, note that if Sprint's initial share were 1-s = 1, i.e., if non-alliance carriers' share was s = 0, then there would be no gains from diluting their share.) In such a case, Sprint would have to be compensated through a price that exceeded its marginal cost. The relevance of this point is that if Telmex and Sprint wished to implement call turnaround on a large scale, then some

---

The other term in L, $r(s - s^*)(N_i - t)$ reflects Sprint's *increased* share $(s - s^*)$ of the remaining incoming minutes, due to its increased share of outgoing minutes induced by the t extra outbound minutes it sends following the call turnaround. Thus, only if Sprint's initial share of the U.S. market were 100% (1-s = 1), would there be no overall gain to the alliance—because only in that case would there be no carriers outside the alliance that can be exploited (s = 0).

method may have to be found to compensate Sprint beyond simply paying it a price for wholesale transport equal to its marginal cost of providing such transport.

One possibility might be for the joint venture to pay Sprint for carrying the extra outbound minutes a price that exceeds Sprint's new marginal cost. Such transactions may not be easy for regulators to detect, because wholesale capacity is often procured under private contracts. However, detection could be made even more difficult if the compensation instead took place, at least in part, also through the joint venture (STC). Telmex may be able to benefit Sprint through the joint venture, by increasing the joint venture's profit in all manner of ways (e.g., by assuming a higher share of its marketing and promotion costs). As a (50%) co-owner of the joint venture, Sprint would benefit.

The next section, II.C, shows that a jointly owned such affiliate could also be helpful to align the interests of Telmex and its ally in manipulating the ISP to benefit at the expense of other carriers through carrier call re-origination, a form of call inflation that could otherwise be disadvantageous to Telmex, but would be profitable to the alliance as a whole and therefore also to Telmex if it could be compensated. In such cases, affiliate once again helps to align interests, but this time by helping to compensate Telmex.

Alliance's retail revenue need not fall. Importantly, the call turnaround strategy described above can entail no sacrifice in the foreign carrier's retail revenue. Sophisticated electronic call turnaround schemes have recently emerged that permit the foreign carrier to initiate such turnaround without even the knowledge of either of the subscribers. The foreign carrier simply intercepts a call from its market headed to the U.S., strips the signaling information and diverts this information to a computer of its U.S. alliance, and the computer then opens two voice channels linking the U.S. and foreign subscribers to complete what will appear as a U.S. outbound call. The foreign subscriber simply gets billed the same retail rate it would have paid otherwise, and the call is merely reported as a "callback" from the U.S.

Of course, the profitability of such strategies does not hinge on this particular example, nor on Telmex being able to charge exactly the same retail price as it would have charged for a Mexico outbound/U.S. inbound call. Even if call turnaround (through cruder methods, as discussed below) necessitated charging instead a lower U.S. retail price, such a strategy could still be profitable as long as the difference between the Mexican and U.S. retail prices was not too great. Moreover, as explained above, such strategic manipulation of the ISP will, by raising the incremental costs of U.S. carriers, lead to higher U.S. retail prices and therefore diminish any such loss to Telmex.

Unique advantages of dominant foreign carrier. A dominant foreign carrier is in a particularly good position to initiate such affiliate call turnaround, for at least two reasons. First, it carries to the international gateway most if not all of the outbound calls from its country, and therefore is in a position to implement turnaround as described earlier, before the call even reaches the U.S. Second, it has information about all U.S. subscribers called from its country. It could pass that information to its U.S. affiliate, who would then be able to target selectively the U.S. subscribers of *other carriers* and offer them small inducements to reverse the pattern of calling. For example, a U.S. subscriber could be induced to persuade his foreign relatives to call him less and that he will call them instead. Such schemes are a more primitive form of call turnaround than the electronic version described earlier.

C. Reducing U.S. Carriers' Credits for Inbound Minutes by Diluting their Share of Outbound Minutes through "Call Inflation" of the Alliance's Minutes: Call Re-Origination and Related Schemes

The call turnaround strategy harms other U.S. carriers for two reasons: reducing total U.S. inbound minutes; and diluting their share of U.S. outbound minutes (hence also of the remaining inbound) by increasing the alliance's own share through increasing its

U.S. outbound traffic by the traffic that is turned around. The latter, dilution effect can be accomplished also through strategies that do not involve reducing U.S. inbound minutes, but merely inflate the number of U.S. outbound minutes carried by or merely reported by the alliance. I use the word "inflate" because, as explained below, the minutes will not represent genuinely useful additional minutes from U.S. consumers.

Recall from Section II.A that total settlement payments made by all other (non-alliance) carriers are: $T = r(n - sN_i)$, where r is the settlement rate, n is these carriers' total outbound minutes, and sN_i is their credit for inbound minutes (used to offset some outbound minutes). Call turnaround operates by reducing N_i *and* increasing the alliance's outbound minutes by an equal amount (t minutes in the example), which therefore dilutes others' collective share below s. "Call inflation" involves only increasing the alliance's U.S. outbound minutes, and purely in order to increase its market share so as to dilute others' share (s) of credits for inbound minutes. One such tactic is *call re-origination*.

Call re-origination involves a carrier in country 1, say, sending a call to country 2 indirectly, by routing it through country 3. The usual purpose of this and other so-called "least-cost routing" practices is to arbitrage non cost based differences in the settlement rates a country charges to terminate traffic from different countries. In our example, such a strategy would be profitable for a carrier in country 1 if country 2 charges a higher settlement rate for terminating traffic from country 1 than from country 3, and the difference exceeds the additional cost of re-routing the call. The carrier in the terminating country (country 2) typically frowns on such practices, because they cause it to receive the lower instead of higher termination rate. However, when a dominant foreign carrier can enter the U.S. market, it can profitably re-route through the U.S. calls destined to its country from other countries, obviously not for purposes of arbitraging its own termination rates but purely to increase the market share of its alliance in the U.S.

Returning to the concrete example of Telmex/Sprint, suppose that Telmex or Sprint requests that a carrier in some third country, say Germany, route traffic destined to Mexico through the U.S. instead of sending it directly. For simplicity, suppose that Telmex charges the same settlement rates to traffic from the Germany as from the U.S. Then the only extra cost of re-routing is the extra international transport cost. The gain to the alliance from encouraging such re-routing is to inflate its U.S. "outbound minutes" for purposes of inflating its market share—and thereby diluting other U.S. carriers' share and hence their share of credits from U.S. inbound minutes from Mexico.

Affiliation can help to align interests. Suppose instead that re-origination is from a country whose settlement rate with Mexico is higher than is the U.S. rate. As long as the difference between these settlement rates is not too great (and the extra transport cost of re-routing is not too large) the alliance as a whole can gain from re-originating such traffic through the U.S. for purposes of diluting other carriers' credit share of inbound minutes. However, in such a case, Sprint would benefit from the increased credit share, but Telmex would lose—because it would receive the U.S. settlement rate instead of the assumed higher rate from the third country. In such a case, Telmex would approve only if it can share in Sprint's increased profits. Taking joint ownership in the affiliate may enable Telmex to benefit while passing regulatory scrutiny more than if Sprint had to compensate Telmex through explicit financial transfers.

Other schemes to accomplish such "call inflation" might include: (a) simply misreporting the number of minutes that are sent to Mexico by the alliance ("phantom minutes"); or (b) creating "computer generated minutes" whereby a computer belonging to the alliance in the U.S. calls another computer in Mexico and the minutes are recorded as IMTS for purposes of increasing the alliance's recorded market share of U.S. outbound minutes and thereby diluting other carriers' share.

It is important to stress that call inflation—whatever the particular underlying strategy that generates it—will show up as increase in foreign carrier's outbound minutes, and appear as a pro-competitive expansion of U.S. output. But this is illusionary, as the "expansion" does not represent useful minutes for U.S. consumers, but merely gaming of the FCC's proportionate return system made profitable by above-cost settlement rates.

These examples, which are by no means exhaustive, should make it clear that there is ample room for dominant foreign carriers to game the ISP through their U.S. operations. The fact that such phenomena have not occurred thus far on a massive scale provides little comfort, for two reasons. First, the technologies are relatively new and becoming ever more sophisticated. Second, the FCC's *Foreign Participation NPRM* proposes to relax significantly the safeguards against entry even by dominant foreign carriers into the U.S. market if that entry is not facilities-based but through resale, a distinction that I have pointed out is largely inconsequential.

D. Incentives for Gaming the ISP Are Greater when a Dominant Foreign Carrier Affiliates with a Smaller than with a Larger U.S. Carrier

Another point deserves mention. The gains to a dominant foreign carrier from gaming the ISP in the various ways described earlier is greatest if it forms an alliance with a small rather than a large U.S. carrier. The reason is that the gains are coming from increasing the settlement payments made by those carriers that are left out of the alliance. The larger is their initial market share and therefore share of credits for inbound minutes, the greater is the potential gain to the foreign carrier from eroding these credits.

Recall that total termination payments made by all carriers outside the alliance are: $T = r(n - sN_i)$, where r is the settlement rate, n is these carriers' total outbound minutes, and sN_i is their credit for inbound minutes. Thus, the potential gains from *increasing* T are greatest when n and s initially are large (recall that s is the combined market share of