The WTO Agreement and Telecommunications Policy Reform

Peter Cowhey

Mikhail M. Klimenko

Happily, the revolution going on in the telecommunications industry is benign.

Technological change and competition are making possible changes considered improbable even 15 years ago. The WTO Agreement on Basic Telecommunications Services created a new regime for the world market. Now we must pay close attention to regulatory fundamentals.

Summary findings

Every country serious about introducing competition finds that the transition from monopoly to competition is both economically rewarding and laden with policy dilemmas. As a new century begins, we have an essentially new market for telecommunications. Digital technology forced a reexamination of the opportunity costs of protecting traditional telecommunications equipment and service suppliers. An inefficient market for telecommunications threatened competitiveness in the computer, software, and information industry markets.

Meanwhile, after dislocations created by global stagflation through the early 1980s, developing countries became interested in privatization of state enterprises as a tool of economic reform—and state telephone companies were especially promising targets for privatization. Those countries began exploring options for allowing selective competition, as phone companies in major industrial countries began looking to foreign markets for new business opportunities.

The WTO Agreement on Basic Telecommunications Services created a new regime for the world market.

Now we must pay close attention to regulatory fundamentals:

- Low barriers to entry in the market for communications services.
- Effective rebalancing of rates for services during the market transition.
- Strong interconnection policies.
- The creation of independent regulatory authorities with the resources and power necessary to foster competition and safeguard consumer welfare.

Cowhey and Klimenko assess how developing and transition economies have fared in profiting from changes in the telecommunications market. They also examine the policy challenges that remain, paying special attention to the global market and regulatory milieu fostered by the 1997 WTO agreement. They ask what this latest transformation has taught us about wise management of this vital part of the world economy's infrastructure. They focus on the economics of managing the transition to competition, the design of proper regulatory policies and processes, and the embedding of domestic telecommunications in the world market.

This paper—a product of Trade, Development Research Group—is part of a larger effort in the group to help developing countries formulate negotiating positions for WTO talks. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Lili Tabada, mail stop MC3-303, telephone 202-473-6896, fax 202-522-1159, email address ltabada@worldbank.org. Policy Research Working Papers are also posted on the Web at <http://econ.worldbank.org>. Mikhail Klimenko may be contacted at mklimenko@ucsd.edu. May 2001. (67 pages)

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TELECOMMUNICATION POLICY
REFORMS**

Peter Cowhey and Mikhail M. Klimenko

University of California in San Diego
Graduate School of International Relations
and Pacific Studies

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Introduction

A technological revolution, changes in the competitive structure of the world economy, and financial needs have prompted many countries to transform their policies for the telecommunications industry in the past 15 years. Yet developing and transition economies have chosen significantly different approaches to competition and privatization. As a result, the degree of competition, the regulations governing competition, and the approach to opening the domestic telecommunications market to the global telecommunications market vary widely across these economies.

Not surprisingly, rapid change and the diversity in policies have created an impetus for finding some new common ground in the global market. The International Telecommunications Union tried to provide such a framework, but its legacy as the institution tied to monopoly in phone markets proved too great a burden. Moreover, it lacked the power to lay down definitive rules for a market in which the cross-border supply of telecommunications services and capital, the hallmarks of every other market in high technology, was now a critical issue. In 1997, a new framework emerged through the World Trade Organization (WTO) Agreement on Basic Telecommunications Services. This agreement combined binding commitments on market access from its participants with a statement of “procompetitive regulatory principles” that have rapidly become the definition of the policy revolution under way in this market.

This study assesses how developing and transition economies have fared in profiting from changes in the telecommunications market and examines the policy challenges that remain. It pays special attention to the global market and regulatory milieu fostered by the WTO Agreement of 1997. The study asks what this latest transformation has taught us about wise management of this vital part of the infrastructure of the world’s economy. It focuses on the economics of managing the transition to competition, the design of proper regulatory policies and processes, and the embedding of domestic telecommunications in the world market.

I. The Economics of the Transition to Competition and the Creation of Effective Regulation

Every country that is serious about introducing competition finds that the transition from monopoly to competition is both economically rewarding and laden with policy dilemmas.¹

The Global Market Revolution and the WTO Agreement

We have a fundamentally new world market for telecommunications at the close of the century. This development marks the closing of a policy circle in which the market has moved full circle from initially competitive circumstances (Mueller 1983). Only later did monopolies emerge, and with them came a form of collective amnesia. It seemed as if monopolies had always existed.

It was only in 1984 that the United States forced the divestiture of AT&T and thereby created competition in the market for long distance services. The divestiture also liberalized the market for competition in telecommunications equipment. Only the United Kingdom and Japan followed the American lead on services initially and also introduced the possibility of competition in local phone services. However, both countries restricted the number of new entrants. Most other countries simply rejected the notion of competition in telephone services, until Australia, New Zealand, and Canada gradually embraced competition in this area.

In October 1986 the WTO (then the General Agreement on Tariffs and Trade, or GATT) launched the Uruguay Round. For the first time (and somewhat ambitiously) the Uruguay Round included trade in services on its multilateral agenda (Whalley and Hamilton 1996). It quickly became evident that trade in telecommunications services would be defined only as trade in value-added services such as data networking.

During the Round (which was completed in December 1993) three developments changed the telecommunications industry. First, the digital technology revolution began to change the market fundamentally. Digital technology forced a major reexamination of the opportunity costs of protecting traditional telecommunications equipment and service suppliers (Cowhey 1990, 1999). An inefficient market for telecommunications threatened competitiveness in the computer, software, and information industry markets. For example, after experimenting with limited competition in data and mobile communications through the early 1990s, the members of the European Union (EU) concluded that monopoly control of the public telephone network would always

¹ In this regard telecommunications is no different than the kinds of transitional issues posed by macroeconomic reform. But fortunately the economics of the telecommunications revolution are fundamentally benign. No one embracing competition in telecommunications markets has faced the kinds of periodic crises involving international financial markets or growth rates that reengineering macroeconomic policy can occasion.

discourage realistic pricing and provision of the infrastructure for information services and equipment.

Second, after dislocations created by global stagflation through the early 1980s, reforms in the economic policies of developing countries stimulated interest in privatization of state enterprises as a tool of economic reform. State telephone companies were particularly promising targets for privatization. Once privatization became a serious option, these countries also began exploring other options for allowing selective competition. Third, even as competition began in the major industrial countries, their phone companies looked to foreign markets to create new business opportunities. Yet all phone companies faced major limits on foreign market access, and once in a foreign market they confronted serious regulatory uncertainties about how they would be treated. This situation was not simply a case of industrial countries pressing developing countries. Suspicion among industrial countries ran equally deep. Thus, just as the Uruguay Round closed in 1993, Europe and the United States warily approached the idea of expanding trade agreements to cover basic telecommunications services. Suddenly, dismantling traditional monopolies for telephone services (or “basic services” in the language of trade talks) had become a high-profile test for the world trade system.

It is fair to say that most countries were skeptical about or indifferent to the reopening of trade negotiations on telecom services as an extension of the Uruguay Round in 1994. But the success of neoliberal economic reforms in Asia and South America had put even the most politically untouchable forms of monopoly up for reexamination in the mid-1990s. And the soaring U.S. economy, symbolized by its resurgent information industry, led all major countries to believe that a profound globalization of the information industry was both inevitable and a driving force for national economic growth.

The major industrial countries were impatient to secure their mutual rights to market access in telecommunications services, and the WTO was a convenient forum for achieving this goal. However, the multilateral features of the WTO (particularly the Most-Favored-Nation [MFN] and National Treatment obligations) meant that mutual opening among countries of the Organization for Economic Cooperation and Development (OECD) automatically conferred benefits on developing countries. The industrial countries realized that the issue of securing competition and open markets in basic telecommunications services in developing countries had to be faced immediately. Otherwise, these countries would lose a trade deal among themselves. Thus, the fate of the WTO telecom talks became joined to the spread of competition in basic telecommunications services to developing countries (Cowhey and Richards forthcoming).

The trade talks could not have forced the developing countries to adopt unacceptable reforms. But the political effort generated by the negotiations induced leaders among the newly industrializing countries to make deeper and faster market changes that binding trade commitments would make irrevocable. The timing was right,

because national governments in trade-oriented economies were putting regulatory reforms and the introduction of competition in the telecommunications sector high on their policy agendas. Increased volumes of trade and factor mobility at both regional and global levels had intensified reliance of business users and households on telecommunications services. Households were demanding even more sophisticated services at lower prices. Commercial enterprises were becoming increasingly concerned about the competitive effects of poor quality. Moreover, the pricing and flexibility of telecommunications services were becoming a larger factor in production. But traditional state-owned monopoly suppliers had largely failed to provide low-cost, efficient, or even widely available services in many countries.

A number of empirical studies have found that investment in telecommunications infrastructure is a strong predictor of economic growth (Madden and Savage 1998). This finding suggests that in order to accelerate economic development, countries need to create policy environments conducive to a high level of investment in the telecommunications sector. Therefore countries in dire need of investment want assurances that operating surpluses from profitable segments of the telecommunications industry will be used for network upgrades and expansions. Fortunately, competition tends to modify the trend (followed by traditional monopolies) of spending the surplus on vested interests without significant modernization. The number of local exchange lines in the Philippines doubled, for example, within three years after competitive entry was allowed.²

WTO negotiations on basic telecommunications offered an instrument for consolidating and promoting the liberalization of competition and trade in telecom services by making legally binding commitments on future liberalization plans. As far as regulatory reform in telecommunications was concerned, the negotiations definitely enhanced the ability of national regulators to convince markets that reforms in their countries were unlikely to be reversed.

Some governments used the WTO Agreement on Basic Telecommunications to accelerate policy reforms and make binding international commitments to the future liberalization of basic telecommunications. Other governments bound only the existing policy regimes or even made commitments making market access less liberal than it already was. However, even if a government could not, for political reasons, sustain the existing levels of liberalization, the commitments were still valuable. For example, commitments binding at less than the current limit on equity to any foreign investor will be “ratcheted up” after they enter into force because of the MFN principle. Using the MFN clause, any new entrant from one country can demand the same level of equity participation granted to a supplier from another country (Low and Mattoo 1997). The three Central and Eastern European countries and four Latin American countries reviewed in this paper made commitments binding the governments to the status quo or promising future liberalization in certain areas—promises that had not been planned prior to negotiations.

The WTO Reference Paper: A Major Achievement

A major achievement of the negotiation was the creation of the “Reference Paper” on procompetitive regulatory principles, which was accepted by 67 countries making binding offers on market access (Arena 1997). Two factors were behind the Reference Paper. The first was a sense that the negotiations were an opportunity to create a firm set of common understandings of how competition, or a transition to competition, must be governed.² The principles are sufficiently broad to allow for diverse rules and practices but sufficiently specific to hold governments accountable for the fundamentals of market-oriented regulation. The second and more immediate factor was a distrust of any market access commitment that was not backed up by enforceable rights in regard to the “invisible” barriers to competition and market access. In the telecommunications sector, a government’s commitments to free trade may not be strong enough to guarantee real market access for foreign suppliers of services because of the very high levels of concentration. Monopolistic suppliers could frustrate competition from new foreign entrants despite trade liberalization commitments.

Differences in the ways countries choose to regulate their monopolies may also inhibit free trade. Universal service obligations, terms of interconnection, licensing criteria, and regulators’ procedures can create important indirect barriers to trade. Regulatory reform is thus a more significant component in liberalizing trade in services than trade in goods. For this reason the agreement includes explicit regulatory principles.³ Most remarkably, the parties agreed on what constituted the heart of procompetitive regulation in the market. The obligations of governments to create effective interconnection rules and the need to separate the regulator from the operator are at the core of the principles (box 1).⁴

² According to figures provided to the authors by the National Telecommunications Commission of the Philippines in 1998, competition for telephone services was authorized in March 1995. The number of main lines increased from 1.409 million in 1995 to 3.352 million in 1996 and 5.786 million in 1997, not including cellular lines. Most of the increase was due to build-out by new entrants in the market. The teledensity index in the Philippines rose from 2.01 in 1995 to 8.06 in 1997.

³ Some observers question whether harmonization and multilateral disciplines on regulatory principles in member states should be negotiated alongside trade liberalization. See, for example, Bhagwati (1994). The argument is that free trade is most efficient when differences among nations can be exploited by the industry seeking to specialize.

⁴ Companies do not have rights and duties under the WTO. Only governments have rights and duties. Thus, if a dominant carrier discriminates against foreign-owned carriers in the national market the parent government of the foreign company has to decide if it will bring a complaint against the national government of the dominant carrier alleged to be engaged in discriminatory action.

Box 1. The WTO Reference Paper

What does the WTO Reference Paper say to the telecommunications industry? It makes six major points, which we summarize below. The General Agreement on Tariffs and Trade (GATT) in Services contains additional rules, because the telecommunications agreement operates as an industry-specific code within the GATT framework.

- The Reference Paper sets out rules for governments on regulating “major suppliers” of telecommunications services. A major supplier controls “essential facilities for the public network” that cannot reasonably be duplicated for either economic reasons, technical reasons, or both.
- It requires governments to take measures to ensure that major suppliers do not engage in anticompetitive practices such as cross-subsidies, use information obtained from competitors, or withhold needed technical information from competitors.
- It states that governments will assure interconnection with a major supplier for competitors at any technically feasible point in the network. The terms, conditions, and quality must be nondiscriminatory (that is, no less favorable to the competitor than to the major supplier). Interconnection must be timely, and rates must be reasonable and transparent, taking into account economic feasibility. Services must be unbundled so that suppliers are not paying for network components or facilities they do not need. The terms for interconnection must be publicly available and enforceable on a timely basis.
- It allows governments to maintain policy measures that are designed to achieve universal service. However, these measures must be administered in a transparent, nondiscriminatory, and competitively neutral way. They should not be more burdensome than is necessary to achieve universal service.
- It stipulates that the regulatory body be separate from the actual suppliers and that it employ procedures ensuring impartiality for all market participants.
- It requires governments to use procedures for the allocation and use of scarce resources (including frequencies) that are timely, objective, transparent, and nondiscriminatory.

The WTO agreement has a significance that goes beyond the specific commitments and the impressive number of signatories: 67 of 69 governments made significant liberalization commitments.⁵ One way to capture the extent of the agreement’s impact is to look at its effect on markets. The U.S. government has calculated that approximately 85 percent of the world market, measured by revenues, is covered by strong market access commitments in the negotiations. With a few specific exceptions on particular issues or market segments, all the OECD nations essentially were bound to unconditional market access on January 1, 1998. And a review of the major industrializing countries shows very significant commitments on market access that increased very rapidly over a period of a few years (typically after transition periods ranging from two to five years). There cannot be a fundamentally new way of doing business, including regulating

⁵ The number of signatories is especially significant, because most WTO agreements emerge from multi-sector and multi-issue negotiations where tradeoffs can occur over many industries and items. The telecommunications agreement broke this pattern (Hoekman 1996).

business, in 85 percent of the world market that will not spill over to the rest of the global market. Moreover, the changes embodied in the WTO pact are going to accelerate as the convergence of communications services grows.

Another way to understand the agreement's significance is to view it as a fundamental change in the international regime. The concept of a "regime" captures the principles, norms, and rules expected of participants in major fields of governance in the world economy. In other words, it captures expectations about how the market and governments will interact that go beyond strict legal agreements.⁶ Precisely because of its potential to change fundamental expectations, officials at the International Telecommunications Union (ITU) were once highly skeptical of any WTO negotiations on basic telecommunications services. They rightly saw any such negotiation as a challenge to the traditional regime, premised on monopoly for phone services and limited competition for data services, that had been long serviced by the ITU.⁷

The New Agreement Has Fundamentally Changed the Market

The change in the international telecommunications regime has three major implications: First, for countries that are not yet members of the WTO, the WTO telecommunications agreement will influence the terms of their accession; their minimum commitments on telecommunications will have to be significant. Second, the agreement has changed the expectations of all economic agents, including governments. Countries with less regulatory transparency and little competition will be considered riskier, because markets do not believe that traditional telecommunications practices are sustainable. Moreover, any dominant set of regulatory arrangements creates its own set of supportive political coalitions. We can expect the WTO agreement to create interest coalitions in many important countries in order to promote further market opening in economies where open competition in telecommunications has not yet taken root. These coalitions will use trade negotiations, transnational political lobbying, and market activities to expand the realm of competition.⁸ Third, the WTO agreement has accelerated the growth of new global carriers for communications services and new forms of cross-border information services using innovative technology. This last point requires special consideration, as it shows how a new international regime changes options for domestic markets. The WTO agreement's strong coverage of both industrial and industrializing countries makes it easier to conceive and execute new ways of providing services on a global basis. The result is a surge of new entrants with innovative business models and new technological approaches (box 2).

⁶ In terms of economic theory a close analogy would be a "focal point" in a bargaining game—a point in the continuum of options that comes to dominate expectations and thus shapes the initial strategies of actors (Keohane 1984).

⁷ To their great credit ITU officials later embraced the WTO work as the most convenient vehicle available for organizing new multilateral rules for a more competitive world market. It now works actively with the World Bank, assisting countries with implementation problems involving WTO obligations.

⁸ See Baron (1995) on how regulatory institutions can encourage particular political coalitions.

Box 2: New Business Models for International Service

Many new entrants to the telecommunications market have novel business models and are deploying new technologies for global services. Even older carriers are radically reorganizing their international businesses. The following examples show just how dramatically the market for international services is changing.

- ***The wholesale international transport business.*** Qwest, a wholesale carrier, is building a fiber-optic network that covers the entire United States. The network serves only other carriers, not retail customers. Several carriers are doing the same thing across the European continent, and Global Crossing is taking the wholesale model a step further into the international market. Global has announced plans to create a worldwide cable system that will operate purely as a carrier's carrier selling capacity on a first-come, first-served basis. Its first cable, Atlantic Crossing 1, already accounts for about half of all transatlantic capacity. Like Qwest, Global Crossing is only a carrier's carrier and caters to the needs of new entrants in ways that cables built under the old system of jointly supplied services did not.
- ***The retail international service business.*** Traditional carriers of international voice and fax services are experimenting with business models that overturn the old model of jointly provided services. For example, more carriers are originating their own national traffic and transporting it over the ocean to a foreign country using their own facilities rather than those of a foreign partner. Once the traffic arrives in the foreign country, it is in effect put up for bid among competing local carriers.
- ***A single operating system for global services.*** The most dramatic example of this approach is Global Mobile Personal Communications Services. The services will be provided by low Earth-orbiting satellite systems like Globalstar and Iridium. The national distributors of the global satellite service own equity shares in the satellite system, but a single entity owns and operates the enterprise. AT&T and British Telecom, the two largest international carriers, plan to merge ownership of all their international transport facilities and correspondent relations. They hope a single global network will be significantly more efficient than piecemeal arrangements. But they have also said that joint operations will permit them to reduce costs by lowering settlement rates and taking advantage of arbitrage opportunities.
- ***Global facilitator strategies.*** Some companies outside the United States, such as Teleglobe, specialize in providing global transport and foreign correspondence capabilities to small new carriers in Asia and South America. One carrier provides international cable capacity or resells international services to these carriers, which then provide very profitable international long-distance services. The carrier also grants a "foreign correspondent agreement" to these new carriers in every country where it has an operating license. These correspondent agreements, while largely unnoticed outside the exotic world of international telecommunications carriers, are the key to yielding profitable streams of international traffic.

- **Global Internet networks.** These entities own some of their facilities but rent much of their capacity. They specialize in pursuing market niches and often transport the traffic of much larger carriers at a steep discount in order to fill up their transmission networks. They make their profits from the specialized services they offer to retail customers. Some of the big international carriers are in the process of creating their own subsidiaries that will function as “lite” carriers. However, there are doubts about whether they will grant the subsidiaries enough autonomy to succeed.

These new ways of providing global telecommunication services are reshaping the economics of the market for services within and among countries. The old international telecom regime favored the “joint supply” of international phone services using accounting rates.⁹ Under this system each carrier theoretically contributes half the international phone or fax service—for example, taking the international call from a hypothetical midpoint in the ocean and terminating the call to a local household in its country. Presumably the supply of an international call depends on each national carrier providing half of the facilities for the call. For contributing this capability the national carrier is entitled to a fee usually equivalent to half of the accounting rate—the “settlement rate.”

The settlement rate is not the end price to consumers. National carriers can and do mark up the price still further for originating an international call. But the costs created by settlement rates influence the minimum price for the service. The key cost is the net settlement payment. For example, the United States sends 10 minutes of calls to Mongolia at a settlement rate of \$1 per minute. Mongolia sends the United States a total of five minutes of calls at this rate. The net settlement payment from the United States to Mongolia in this period is \$5. The U.S. carrier must recover this payment from its own customers, a significant cost element in its pricing decision.

Jointly provided services allow one party to block production. Given the problems with pricing in most developing countries, pressure to cover shortfalls on local services by inflating rates for international services has been enormous. And it has been particularly attractive to extract rents from carriers in industrial countries by inflating settlement rates. Moreover, in the era of monopoly, companies relied primarily on national public financing to build the network. Profits from settlement rates were thus an important source of the convertible currency needed to finance purchases of foreign telecommunications equipment.¹⁰

The idea of joint supply by two national carriers under a settlement rate seemed logical in a world of national monopolies. But it has never been economically necessary

⁹ Accounting rates are the negotiated prices for end-to-end international services created jointly by two national carriers. Carriers conduct the negotiations and conclude a commercial contract to establish the accounting rate. We use only the settlement rate because it is the economically relevant concept.

and as competition emerged in some countries, it worked against (for example) the competitive provision of end-to-end international services based on market costs. Joint supply has become an anachronism in a world economy where companies run sophisticated global production and distribution networks. Multinational firms choose to make or lease production or distribution capacity in running global operations in order to optimize costs, speed of innovation, and other market relevant criteria. However, outdated regulations determine how to produce and cost international services, an issue that from the start has brought telecom regulations under intense pressure.¹⁰

As a consequence of regulatory inefficiency, the international dispute over potential changes to the system of settlement rate fees and the tradition of jointly provided services has been significant.¹¹ In theory, the WTO agreement did not demand radical changes in these practices. But, in fact, the ability to enter markets freely across national borders and to own and lease facilities for services on nondiscriminatory terms has forced a rethinking of traditional practices. At a minimum, carriers in competitive industrial markets who wanted to move traffic under the traditional system of jointly provided services must lower settlement rates to levels in line with the costs of owning and running a global network. As a result, settlement rates among industrial countries have plummeted since the WTO agreement. Both the United States and the European Union have also adopted regulations designed to dispense with settlement rates for a large amount of international traffic. And the rapid changes in these rates have opened up numerous opportunities for arbitrage in the delivery of traffic to developing countries.¹²

In short, the world trade agreement accelerated changes that are radically changing pricing and supply options for the world market. Even developing countries that made no commitments on telecommunications services at the WTO will face significantly different market economics and politics as a result of this change in the global regime.

¹⁰ It was so attractive that finance ministries routinely diverted the monies to cover other budgetary needs. The ITU constantly urged member countries to resist the temptation to divert these funds to other budgetary purposes.

¹¹ The WTO negotiation carefully finessed the issue of whether the accounting rate system has features that make it incompatible with trade obligations. The agreement included a "standstill agreement" that practically exempted all countries from a WTO challenge to accounting rate policies until January 1, 2000 (Arena 1997).

¹² The Federal Communications Commission (FCC) created an international uproar when, in August 1997, it introduced the equivalent of price caps on the settlement rates that American carriers may pay to foreign carriers. Whether or not the FCC is able to sustain its "benchmarks," it is safe to say that the initiative will contribute to a fundamental change in the costs of terminating traffic in developing countries. Already, a very significant share of all international traffic to and from developing countries is operating on terms and conditions that defy traditional practices concerning settlement rates (Cowhey 1999).

¹³ Settlement rates are very inconsistent. Rerouting traffic through a third country may be cheaper for a carrier than sending it directly to a country.

The Revolution in Pricing and Supply of Global Services Is Only Beginning

Even this array of options only begins to capture the import of the digital packet network organized around Internet Protocols (IP networking). While all forecasts are suspect, most experts would agree that the following predictions capture the contours of the changes being accelerated by IP networking. McKinsey and Company (1995) estimated that global fax, voice telephone, and virtual private networking services over IP networks in 1997 amounted to about US\$2.2 billion and that total global real time multisite video-conferencing services amounted to about \$3.6 billion. The International Data Corporation (IDC) projects that those sums will rise to about \$50.6 billion and \$19.7 billion, respectively, in 2001. Virtual private networks on IP networks will be worth about \$25 billion of those totals, and much of the increase in real-time video conferencing will be on IP networks. In comparison, the global telecom market in 1997 was about \$600 billion (Eugster and others 1998).

Another way of understanding the transformation is to look at the growth rates for voice and data in key markets. In the bellwether U.S. market, the latest estimates suggest that the transmission capacity dedicated to long distance data will exceed that for voice somewhere around 2001. Revolutions in both fiber-optic transmission capacity and the price-performance measures for packet switches and routers are further speeding the changes. One expert believes that router-based switches for IP networks will double their price-performance ratios every 20 months—almost double the rate of progress for asynchronous transfer mode (ATM) switches, which were significantly better than traditional central office switches (Staple 1998). Every estimate shows that surging increases in the volume of packet-switched traffic will also lead to far higher volumes of data than traditional voice and fax traffic on most international routes. The growth of electronic commerce over the Internet is causing transoceanic transmission of data to grow at rates of over 90 percent per year. Moreover, such businesses as “video chat rooms” on the Internet defy traditional distinctions in telecommunications and broadcast regulation. And worldwide use of the Web for commerce will explode. IDC research suggests that the number of buyers on the Web will grow from 18 million in 1997 to over 320 million by 2002. The volume of purchases will rise to over \$400 billion by 2002, a compound annual growth rate of 103 percent annually from 1997.¹³

Further propelling this change is the revolution in cross-border production networks that cover everything from agriculture to textiles to advanced computing equipment. A fundamental change in international production has occurred because powerful, cost-efficient networks for computing and communications have allowed whole new ways of coordinating work across national borders (Bar and Borrus 1992). Just-in-time production and delivery, including real-time changes in engineering, are possible on a coordinated basis across several countries. Rapid changes in pricing and inventory decisions are equally feasible. And just as importantly, these changes are spreading. Even

¹⁴ For more information, see the IDC website: www.idc.com/F/HNR/081798ahnr.htm.

less powerful networks can, for example, tremendously assist African farmers in getting more timely and accurate information from urban markets. This information allows them to pursue more cost-effective strategies and leave them less at the mercy of middlemen in the market.

The growth of cross-border production networks has powerful political and economic effects on the telecommunications markets. Even large producers of telecommunications equipment that once opposed competition in telecommunications services now run cross-border production systems. As a result they now view competition in the provision of telecommunications services favorably. The same thing will certainly happen to the specialized manufacturers of information technology equipment throughout Asia and South America.

There Are Ways to Manage the Economic Fundamentals of the Market Transition

Changes in the global market for cross-border communications services will further speed changes in the communications market domestically. Rate rebalancing will have to occur. Rebalancing often leads to short-term discomfort because of such effects as increases in the cost of local phone services. But rebalancing also makes it easier to manage the other economic fundamentals of this market transition, such as building out local networks that adopt new technologies more quickly (and thus enabling better and less expensive services). Six basic economic principles explain much of the debate over the future of telecommunications market policies.

Telecommunications networks have special cost characteristics. A correct analysis of telecommunications networks has to begin by recognizing that, in theory, there is a potential for natural monopoly. Network operators may incur large sunk costs that cannot be redeployed, suggesting that these firms may have declining long-run average cost schedules. These cost schedules will result in natural monopoly in those segments of the industries where the minimum optimal scale of production is large relative to the market demand. For diversified production, a more accurate definition of natural monopoly is based on the concept of cost subadditivity. A subadditive cost structure need not exhibit declining average cost over the entire range of possible outputs. Instead, the average cost curve may have the “U” shape and exhibit economies of scale only over a limited range of outputs. The test of existence of natural monopoly then rests on a comparison of that range with the market demand.

The spatial distribution of potential subscribers is an important factor of telecommunications infrastructure deployment. High spatial concentration is particularly favorable because it allows the utilization of the economies of density and scope, resulting in lower operating costs for telecommunications networks in concentrated urban areas. Telecommunications services in low-density areas have also traditionally been cross-subsidized by more profitable telecommunications services in concentrated urban areas. Therefore, a relatively uneven demographic landscape with

large population concentration in a few select areas could also facilitate the penetration of telecommunications networks in sparsely populated rural areas.

The regulation of monopoly is imperfect and costly. Even a high-minimum, efficient scale of operation for major network facilities does not necessarily justify monopoly on a national scale. Potential market failures in unregulated industries based on technologies exhibiting scale economies have to be compared with potential regulatory failure when the government tries to regulate natural monopoly. Although regulating imperfectly competitive industries is not entirely without costs, these costs are lower when regulators can deal with several competitors in an oligopolistic market rather than with a monopolist. For one thing, oligopolistic competition yields important economic information for regulators. For another, the presence of some competitive constraints means regulators have options other than the micromanagement of carrier costs and revenues. Even if policymakers decide that the presence of scale economies warrants running a telecommunications network as a natural monopoly for some transitional period, the best way to choose the right operator for such a network is through competition for the right to become a natural monopoly.

Competition between two local network operators with declining long-run average cost curves may result in a downward shift of these curves, generating efficiency gains that outweigh the loss of scale economies caused by the moves up along the cost curves. Frequently, competition will induce major reductions in transaction costs that more than offset any losses on scale economies. Finally, in markets characterized by pricing that is only vaguely associated with efficient costing, it may not matter whether new entrants can match the lowest theoretical costs of incumbents. There may still be substantial welfare gains from pricing and service innovations by new entrants. The example of Argentina, which has two regional monopolies, suggests that a single firm does not have to operate local networks nationwide, even assuming the condition of decreasing average cost.

Network externality effects are extremely important. Networks are more valuable if there are more people utilizing them. This externality is especially important to interconnection and universal service policies. In developing and transition economies where teledensities are rather low, the network externality effect may be pronounced. In this case the marginal social welfare benefit of adding new subscribers to the relatively small network may be large, justifying subsidies that will allow additional users to access the network.

Interconnection policy is the bedrock for regulating the transition to competition. The incumbent controlling the “essential” facility may try to deny its rivals access to customers. The interconnection policy requires incumbents with essential facilities to share network economies with new entrants on economically efficient terms. In addition to setting pricing rules, the policy ensures that nonprice discrimination does not hamper entry. For example, new entrants need reasonable flexibility in choosing among the dominant carrier’s network features. The entrants should not have to use

facilities that they can better provide for themselves simply because they need access to a single feature of the incumbent's network. Therefore, unbundling rules are a vital part of interconnection policy. In addition, interconnection policies must address all the major barriers to entry. For example, customers do not want to change phone numbers in order to switch carrier services. A lack of local number portability will result in customer inertia.

Rate rebalancing and openness to new technologies are critical to successful market transitions. New technological options for communications services invariably subvert existing rate structures. As a result many governments end up, intentionally or not, slowing the rate of technological innovation in order to finesse necessary changes in rates charged for telecommunications services. In general, the biggest rebalancing challenges in all countries are the need to raise the price for local phone service while lowering the rates for long distance (including international) and data-related services. Almost as big is the need to differentiate among the rates charged for local services. As long as governments maintain the same prices for local services in urban and rural areas, the market for telecommunications services and investment will be distorted. These distortions are not only costly to economic efficiency but unnecessary to meeting the policy objective of promoting universal access to communications services.

Regulation Is Crucial, but How Do Countries Create Regulatory Systems That Inspire Confidence in the Marketplace?

Regulators in industrial countries have attempted to eliminate a dominant firm's ability to exercise undue market power and to ensure that services are supplied at minimum cost. As a result all OECD nations have embraced general network competition. Countries with underdeveloped networks tend to give priority to creating an environment that will stimulate investment in expanding and modernizing the telecommunications industry. But even making this type of investment a priority has led to increased competition, as competition stimulates investment and induces more efficient costs.

Non-OECD economies share another concern: how to manage the transition from limited competition while assuring access to the investment and technology needed to expand service rapidly. Countries only hurt themselves if they do not create marketplace confidence in the fairness and effectiveness of the regulations guiding the change to competition. But transition to competition has created unique challenges. First, governments must create confidence in a new regulatory system's effective ability to oversee competition. Second, to build market confidence, governments ideally will lay down stable rules governing the market transition. But a combination of inexperience, rapidly changing global conditions, and the difficulties of forging a political consensus on optimal policies often result in a plan for reform that is seriously lacking in more than one respect.

The Virtues of Credible Commitments

Because operating a network entails large, highly specific sunk investments in assets that cannot be redeployed, these networks are vulnerable to “regulatory taking,” or expropriation through *ex post* changes of regulatory policy. In the world of utilities regulation in Western countries, this problem is often discussed in the context of “stranded costs”—those costs utility companies cannot recover as the structure of the market changes from natural monopoly to open competition.¹⁴ Therefore regulators’ ability to commit to a certain reward structure for a regulated firm is essential to creating proper investment incentives in telecommunications. When a regulator’s ability to commit is lacking or is not credible, the regulated firms limit the scale of their investments into network equipment and the size of the bids for operating licenses. Alternately, the investors may demand much higher prices or a higher rate of return on capital to compensate for the risk.

Institutional credibility is important, but the very factors that create or strengthen credibility may slow procompetitive reforms over time. The very measures designed to enhance credibility may work against an efficient policy over the medium term.

Several factors determine regulator’s ability to commit. The duration of their terms of office is limited. Successive regulators may be affiliated with different political parties. Rules imposed by local regulators may sometimes be superseded by rules imposed by central regulators. Regulatory rules may affect many diverse special interest groups that have different ideas of what constitutes fair regulation. Depending on the political power of these groups and their ability to affect regulation, the rules that seemed fair at one point in time may be perceived as unfair at a later point, and the regulator may be subject to strong pressure to alter the rules.

Countries with poor institutional endowments like Central and East European countries (CEECs) can import regulatory credibility from overseas. These countries can reinforce the credibility of their local regulators by either recognizing the jurisdiction of foreign courts over certain contracts between local regulators and private investors (as in Jamaica) or by signing international treaties protecting foreign investments (as in the Philippines). The credibility of regulatory agencies in CEECs has been greatly enhanced since the governments of these countries entered into the agreements with EU governments on harmonizing their national regulatory environments in preparation for the accession of CEECs into the EU.

International organizations like the International Monetary Fund (IMF) and the World Bank may also help to enhance the credibility of regulators in less-developed countries by making financial aid to these countries conditional on adherence to the regulatory commitments. The national governments can increase the commitment powers

¹⁵ For a discussion of the stranded costs problem in the deregulation of utilities in industrial countries, see Brennan and Boyd (1997).

of their regulatory agencies by participating in multilateral liberalization negotiations and exchanging legally binding commitments with respect to their present or future policy regimes in the context of WTO.

The WTO is one mechanism through which countries can make credible commitments to change regulations over time. Governments that are preparing to privatize public network operators may be unwilling to subject them to foreign competition immediately for fear of reducing the proceeds from privatization. Investors will pay more for shares of the network operator if its monopoly position is guaranteed for some time. However, if the government keeps a large stake in the privatized operator, policymakers' ability to make credible liberalization threats after privatization has begun may be limited. And even if the government has no stake in the privatized monopoly, it may still be reluctant to implement policies that could reduce the market value of the company that represents a large share of the total market capitalization of fledgling local stock markets.

The WTO can serve as a vehicle for overcoming the difficulty of making credible commitments to liberalize. Many countries have scheduled a gradual phase-in of stronger commitments on market access and national treatment. Governments that violate their commitment schedules will have to compensate entities that suffer losses. This obligation, which extends to other nations, increases the credibility of the government's intent to liberalize. Several Latin American and CEEC governments have used the WTO Agreement on Basic Telecommunications for this purpose. In effect, they have found a way both to shield their national operators from competition for a limited period of time and to ensure that interest groups do not prolong the situation indefinitely.

Neither the WTO nor an autonomous regulator can solve all the problems of consistency. Perhaps the biggest dilemma of consistency is that it can lead to bad policy. Finding the precise balance between protecting mistaken policy and maintaining credible commitments is one of the toughest challenges for a country. But it is not a novel challenge. Competition in telecommunications services began in earnest about 30 years ago when regulators decided that monopoly markets did not suit the novelty of computer networks. The incumbent monopolists complained about revisions that reduced regulatory credibility. And the move away from monopoly markets certainly opened the way to still deeper *de facto* revisions as entrepreneurs used limited legal exceptions to the monopoly to build gray markets in associated classes of services. The situation requires maintaining a degree of consistency and sufficient commitment to law and contracts so that no one thinks the regulator will change the rules of the game.

Assuring the Independence of the Regulator

While a core consensus exists on the minimum attributes of a credible regulator, the broader debate centers on the relationship between the regulator and general policymaking for telecommunications policy. The core consensus is that national telecommunications should be in the hands of an *independent* agency unconnected with

government ministries and charged with implementing policies covering licensing, pricing, competition, and universal service. The purpose is to build confidence in the process, showing that expert discretion is being used to implement telecommunications policy and that the agency is politically accountable but substantially insulated from everyday politics

This transparency of the process provides two kinds of assurances. First, any effort to influence the opinion of the regulator is a matter of public record. This disclosure limits the possibility of improprieties. Just as importantly, even with perfectly proper campaigns to persuade regulators, all market participants are able to judge whether they have a stake in lodging counter-claims. Second, regulators are accountable for the record on which they base decisions. A common complaint is that governments make regulatory decisions based on information available only to the dominant carrier and government. This situation is a recipe for wrecking market confidence.

It is always difficult to ensure the independence of a regulatory authority from the government, because essentially the regulator remains a branch of the government. Among the mechanisms available to ensure a degree of independence are detailed public accountability, separation of the regulator's budget from the rest of the government budget, allowing the regulator independent hiring and firing authority, and requiring that all communications between government ministries and the regulator be publicly reported. Countries with unpropitious environments can appoint regulatory boards consisting of several commissioners with fixed, staggered terms rather than individual regulators.¹⁵ While a single director of regulation can be highly effective, as is the Director of Britain's regulatory authority (OfTel), requiring votes by a regulatory commission depersonalizes the regulatory process, minimizing the risks posed by a maverick regulator.

Another important dividing line in regulation is the scope of the regulatory authority's power. The U.S. Federal Communications Commission (FCC) covers wire, wireless, and broadcast services. In Britain the Radiocommunications Agency handles wireless policy, while OfTel handles wired networks. Many countries have separate broadcast regulators.

A study of the impact of regulatory reforms on the development of the telecommunications sector in 22 European countries (15 EU countries and 7 East European countries) between 1990 and 1995 found that the type of regulatory agency has an important effect on prices for telecommunications (Hoski 1998b). The presence of an independent national regulatory authority (as opposed to regulation by a governmental ministry) in European telecommunications markets seems to create a market environment that facilitates greater diffusion of mobile telephones and provides higher penetration rates of pay phones. Furthermore, the presence of an independent regulatory authority is

¹⁵ According to Levy and Spiller (1994), countries with poor institutional endowments have "unpropitious" regulatory environments.

related to a degree of tariff restructuring in the telecommunication sector. Independent regulatory agencies seem to provide more cost-oriented pricing than markets regulated by government ministries.

Box 3. Requirements for a National Regulatory Authority

The European Union introduced competition in basic telecommunications services in 1998. Its assessment of progress in creating national regulatory authorities lays down some simple fundamental benchmarks for progress (European Commission 1998). We take those fundamentals and expand on them.

1. A national regulatory authority (NRA) needs legal and functional independence from network operators and service and equipment providers.
2. The issue of whether operators or equipment providers become second staff to the NRA must be decided. Is there a “revolving door” between the NRA and incumbents?
3. The NRA must have adequate funding, expert staff, and the necessary support facilities.
4. The NRA must establish administrative procedures to assure that decisions are transparent—that is, made according to due process, put on public record, and justified in light of this record.
5. The NRA needs the authority to make telecommunications policy and must be structurally separated from the incumbent operator. Do the officials in bodies carrying out regulatory functions participate directly or indirectly in the management of the incumbent?
6. The NRA must have clearly identified authority and procedures for making decisions on:
 - Licensing (including amending and withdrawing licenses);
 - Interconnection (including the reference offer, cost accounting systems, and dispute resolution);
 - Leased lines (in particular their availability on nondiscriminatory terms from the dominant operator);
 - Universal service (including monitoring the finance scheme);
 - Tariffs (including the ability to assure progress toward cost-based tariffs);
 - Numbering (including publication of a number plan under the supervision of the NRA and provisions for number portability);
 - Frequencies (including transparent methods for allocating spectrum and assigning spectrum licenses in procompetitive ways);
 - Granting nondiscriminatory use of rights of ways;
 - Enforcing of NRA decisions.
7. Accountability requires a clear statement of who has responsibility for which decisions and how. Will the principal regulatory authority operate with a single director (like Oftel), or will it have a commission whose members have equal votes (as in Germany or the United States)?
8. NRAs must think globally (Tarjanne 1998). Every national regulator must have the capacity to work with other NRAs not only multilaterally (at the ITU, for instance) but also bilaterally.

Property Rights, Private Governance, and Credibility

The credibility of a government's commitment to regulation is not the only issue that can inhibit infrastructure investments in developing and transition countries. Many countries lack well-defined property rights, sometimes on assets as basic as land. Tornell and Velasco (1992) show that low investment in poor countries is typically the result of inadequate protection of property rights. According to North (1981), inefficient property rights exist because the cost of monitoring, metering, and collecting taxes could lead to a situation in which a less efficient property rights structure yields higher tax revenues for the ruler. Svensson (1998) takes North's argument even further by arguing that in politically unstable countries it may be *optimal* for a rational government not to improve the quality of property rights, even at the cost of low private investments. While an incumbent government bears all the costs of reforms leading to the improvement of property rights, the benefits of such reforms accrue only to future governments. The incumbent government may also be uninterested in clarifying property rights because such reforms reallocate resources away from taxable activities. Such reallocations reduce tax revenues for future governments and constrain their ability to spend on goods and services the current government does not value. Svensson finds empirical evidence for his theory.

Hay and Shleifer (1998) point out that private rules regarding property rights may emerge (and may even be privately enforced) in transition economies as a market response to the failure of the state to take action. However, not all economic agents recognize private rules. Even if the rules are recognized, differences in interpretation and enforcement will exist, so that contracts based on private rules can have very high transaction costs. However, since the governments in polarized and unstable political systems have very weak incentives to provide law and order, it will take a very long time to strengthen the public legal apparatus to enforce property rights. An attractive interim strategy in developing and transition economies is private enforcement of public rules. Public rules are not subject to the problems of multiplicity, obscurity, and illegitimacy that are inherent in private rules. At the same time private enforcement of these rules creates strong incentives that do not exist in the public legal apparatus.

Such a reform has two implications for the telecommunications industry. First, it encourages the industry to create its own private regulatory authority (as opposed to a spin-off from the ministry). Second, it ensures that new network operators and service providers are represented equally with the incumbent operator. Such arrangements are common in some industries. For example, the U.S. film industry has standing arbitration mechanisms for resolving disputed credits. American courts give great deference to such private governance systems.

II. Liberalization Strategies in Developing and Transition Economies

Analyses of privatization in industrial countries suggest that in terms of efficiency, the advantages of private ownership over public ownership are considerably weaker in monopolistic markets (see, for example, Vickers and Yarrow [1988]). Private rent-seeking behind protective barriers cannot be expected to lead to socially efficient results. For this reason adequate measures to reduce market power must accompany privatization.

Most telecommunications policy reforms in developing and transition economies follow one of two major strategies. Some policymakers in transition economies with urgent investment needs choose to introduce competition and private sector participation immediately. Other countries may delay introducing competition indefinitely or introduce it in the medium term, and make the timing of liberalization contingent on the incumbent monopolist's performance. What distinguishes the strategies is the timing of the introduction of competition. (The end point—general competition—is rapidly becoming a given.) The time available for market transitions is shorter today than it was just a few years ago because of other institutional developments. For example, the CEECs want to join the EU, which expects rather rapid movement to competition.

The governments of the countries discussed below did not all choose the same approach. Argentina, the Czech Republic, Mexico, and Peru chose the strategy that was based on fast-track privatization of their incumbent operators.¹⁶ These operators are guaranteed their monopolistic position in different segments of the market for a number of years. Specific timetables for liberalizing these segments have been set in advance. In exchange for the guarantees against competition, the incumbent monopolists have committed themselves to specific investments in network build-out and modernization. The incumbents' shares, together with concessions for monopoly franchise in different segments of the market, have typically been sold through tender to private consortia that often consist of a domestic investor and a major foreign company.

The winning consortia in these countries have appointed new management and implemented drastic restructuring of the business. To increase privatization revenues, prior to the tender the governments typically allowed the monopolists to implement a significant one-time increase in tariffs for services. Rates were then controlled by some sort of price-cap regulation. Regulatory policies also controlled the speed at which monopoly operators were permitted to rebalance their tariffs. These policies typically tried to yield subsidy-free tariffs by the time restrictions on entry were supposed to end and the incumbent operators had to face competition.

¹⁶ Similar strategic alternatives are outlined by Davies and others (1995) and Hruby (1997).

The ability of regulators to attract wealthy strategic investors capable of submitting generous bids at the tenders and implementing efficient restructuring after winning was critical to the success of this strategy. Most of the governments gave privatized monopolies challenging but realistic targets for network expansion, quality of service, and tariffs. It was very important that government regulators ensure effective monitoring and enforce the quality and network build-out commitments of the consortia taking over the monopolies.

Chile, Hungary, and Poland are among the countries that have adopted a strategy of combining delayed privatization with early and complete liberalization of most of the telecommunication markets. Although the number of entrants has been limited in certain segments of the telecommunications industry (such as international telephony), the monopoly markets have been transformed into oligopolistically competitive markets. Intermodal competition from suppliers using alternative technologies arrived with the entry of wireless companies, cable television, and public utilities in both local and long distance services. All countries that pursued this strategy implemented a series of price increases for basic services to rebalance tariffs, with varying degrees of success. This made the markets for basic services more attractive to potential entrants. Making additional frequency bands of radio spectrum available to mobile operators for fixed telephone services also enhanced competition. Civil contracts governed the terms of network interconnection, and competitors could negotiate any agreements. Potential disagreements and conflicts over the contracts were subject to arbitration in court.

Arguably, the key factor in these countries' success was the creation of favorable conditions for local competition in all segments of the market. In all countries that followed this strategy, the incumbent monopoly operator was subject to drastic restructuring that improved its microeconomic efficiency. Furthermore, it was very important for the regulatory authorities to develop flexible but consistent approaches toward the regulation of interconnection and to encourage rate rebalancing and reform in the provision of universal service funding.

The Telecommunications Industry in Central and Eastern Europe: Three Case Studies

The service sector was a relatively low priority in terms of investment in CEEC economies. The telecommunications sector was affected by the prevailing bias toward manufacturing and the lack of potential for generating foreign exchange revenues, as well as by the communist governments' desire to control information flows. The result was dramatic underinvestment in infrastructure. Reformist CEEC governments inherited very outdated equipment, including manual switches and analog technology. Teledensity was not only far lower than the European average but well below the levels typical of newly industrialized countries in East Asia. Networks were heavily concentrated in urban areas, leaving teledensities in rural areas appallingly low.

Heavy investment in network technologies became an imperative for CEEC governments. Most governments have aimed for a 30 percent penetration rate by the year 2000. To meet this goal they need to maintain an annual rate of line growth of 11 percent and to attract more than \$100 billion in investments during the period 1993 to 2000.¹⁷

In the early stages of reform, telecommunications tariffs favored residential and local calls and did not give a reasonable rate of return (even on average) on investments. Underinvestment and low tariff levels resulted in severe excess demand that effectively invalidated the existence of cheap uniform domestic call rates.

This paper focuses on three CEECs—the Czech Republic, Hungary, and Poland—although all six CEECs (Bulgaria, the Czech Republic, Hungary, Poland, Romania, and the Slovak Republic) signed the WTO agreement and are actively seeking membership in the EU. To qualify, the CEECs must harmonize their laws with the laws of the EU.¹⁸ In many ways the EU's requirements for its current and prospective members go far beyond multilateral disciplines of the WTO when it comes to telecommunications.

Telecommunications Reforms in the Czech Republic

The most important steps in the liberalization of telecommunications were taken with the modification of the Telecommunications Act in 1992. In 1993 the state-owned postal and telecom company SPT Praha was split into Czech Post and SPT Telecom. SPT Telecom owned and operated the public telecommunications network that was privatized in 1995 under the framework of the Czech voucher privatization program. Although the 1992 act does not provide for an independent telecommunications regulator, the market benefits from the well-managed regulatory framework of the Czech Telecommunications Office (CTO), a government body that was moved from the Ministry of Economy to the Ministry of Transport and Communications in November 1996.

Three agencies have responsibility for telecommunications policy. The Ministry of Economy is responsible for the main principles of regulation, granting licenses for public networks and services, and approving tariffs for international communications. The CTO provides general administration for and supervises the telecommunications sector, determines technical standards, issues licenses for private networks and services, and manages the frequency spectrum. It also has the right to present new tariff drafts to the Ministry of Finance, which then determines the tariffs (Wissman and Tietz 1997). The Ministry of Finance regulates tariffs with the goal of limiting potentially inflationary increases.

¹⁷ The ITU estimates that achieving a 40 percent penetration in this same period would require \$173 billion in investment.

¹⁸ This harmonization is governed by the far-reaching Association Agreements with the EU (the so-called Europe Agreements). These agreements took effect in 1994 and have brought about considerable liberalization of trade between CEECs and the EU. The agreements also include commitments by CEECs to adopt many of the disciplines of the Treaty of Rome. The Czech Republic, Hungary, and Poland have filed formal applications for full membership.

As a result of the recent talks on accession to the (EU), the Czech government has come under pressure to liberalize the telecommunications market in line with EU norms. The CTO is expected to achieve independence from the government under the new Telecommunications Law currently being debated by parliament.

Privatizing and restructuring the SPT. As a result of the voucher privatization program, the Czech government maintained a 74 percent stake in SPT. At that point the government decided to sell 27 percent of its share to a strategic foreign partner for \$1 billion. The partner would be required to implement a network modernization program worth \$3.5 billion and to ensure a 100 percent increase in the number of main lines by 2000. The tender was organized in 1995, and five international companies submitted their bids.¹⁹ The most attractive bid was offered by the TelSource consortium (US\$1.45 billion). Among the factors that determined the success of the tender were the Czech Republic's successful economic reforms, its political stability, and a strategic location in the middle of Central Europe.

As of early 1998 SPT Telecom had a market capitalization of US\$3.4 billion, making it the largest capitalized and most liquid stock on the Prague Stock Exchange. SPT is also the largest publicly listed company in Central Europe, with 22 percent of its shares listed on the local stock exchange. Since its privatization SPT has outperformed the Czech market, and in 1997 Standard & Poor's gave it an "A" rating. The degree of monopoly that the SPT was promised after privatization and the future tariff policy played a central role in determining the value of its equity. The high proceeds from privatization have been attributed to the relatively monopolistic market structure and the comprehensive regulatory framework, among other things.

In 1996 the SPT installed 417,000 new lines, reducing its waiting list from 650,000 to 623,000. It planned to install 470,000 new lines in 1997 and 480,000 in 1998, increasing teledensity from the current level of 31.8 percent to 43 percent by 2000. It also aimed for 100 percent digitalization in 2002 (up from a 1997 level of 33 percent).²⁰ SPT has invested about US\$1 billion annually for the last three years in constructing the core of the new digital overlay network, of which SDH technology makes up about one-sixth.²¹ Increased digitalization has boosted value-added services, such as voicemail, call-waiting, and conference calls. In 1997 SPT also added other value-added services.

SPT plans to reduce its workforce from 25,000 at the end of the third quarter in 1997 to 15,000 by 2000, reducing its staff by 40 percent and increasing productivity substantially by the end of the decade. Productivity growth and network expansion are

¹⁹ The bids were submitted by the following consortia: TelDanmark in partnership with BT, Ameritech with Deutsche Telecom, a Swiss-Dutch-American consortium TelSource, the Italian operator STET, and an alliance between France Telecom and Bell Atlantic.

²⁰ *Financial Times Survey: Telecommunications*, March 19, 1997.

²¹ *Financial Times Survey: Telecommunications*, March 17, 1998.

expected to increase the number of lines per employee to 290 by the year 2000, up from current levels of 134, and well above the European average of 205.²²

The transition to competition. The SPT's monopoly in the provision of long distance and international telecommunications services was originally intended to last until the end of 1999 but was extended for another year to allow the company to pursue an ambitious investment and restructuring plan. The new Czech telecommunications law, which is scheduled to be adopted in line with the 1998 EU liberalization plan, is likely to include a clause to return to the original cutoff date, with compensation.²³

The Telecommunications Act permits other private operators to run local networks through regional concessions. Some 16 such areas are licensed to 8 private competitors and serve around 10 percent of the population. The SPT does not consider its competitors enough of a threat to warrant acquiring exclusive licenses for the areas.

The government has made several attempts to tackle the problem of rate rebalancing. But the division of regulatory authority has hampered the ability to implement cost-based principles in line with the EU by raising line rental and local call charges. The Ministry of Finance, which is responsible for formulating tariff policy, has resisted the SPT's proposals to increase local call charges as a way to help generate revenue for the company's modernization plans. But the SPT's international tariffs are regulated by the CTO, and the company has been successful in reduced international (and long distance) tariffs in line with EU norms. Nevertheless, the existing tariff structure is far from cost-oriented. Tariffs for mobile, data, and some value-added services remain unregulated and are relatively higher than OECD averages. The new Czech telecommunications law, which is supposed to harmonize the Czech laws with the EU legislation, will provide for tariff rebalancing.

Public utilities, in particular the electricity distribution network and the railway system, have exclusive rights to build and operate their own communications infrastructure and have considered entering the telecommunications market. The Czech railway company, together with several private investors, has started to deploy a US\$120 million digital network. In 1996, the eight regional power-supply utility companies formed a joint venture, Aliatel, that controls modern, fiber-optic networks with sufficient capacity to carry public traffic. By 1999 this network was expected to be accessible to 60 percent of businesses and 50 percent of households. The company also planned to provide Internet and related services; virtual private network services with data, voice, and picture signal transmission capabilities; and ATM and public telephone service.²⁴

The Czech government opened the mobile telephone market to competition in 1996. Since that time the two licensed providers of Groupe Speciale Mobile (GSM)

²² "SPT To Take Rationalization Lead," *Finance East Europe*, 4/11/97, n7, p. 14.

²³ *Prague Business Journal*, November 2, 1998.

²⁴ "Keeping the Upstarts Down," *Communications International*, March 1998, 25(3):43-48.

services have been competing for market shares through aggressive pricing. The SPT is the major player in the market through its mobile subsidiary Eurotel. A second GSM license was awarded in March 1996 to Radiomobil. In the GSM market, Eurotel had more than 100,000 customers after only six months of operations, while Radiomobil had only 35,000. There were 508,000 cellular subscribers in 1997, bringing cellular teledensity to 4.9 percent, up from 1.9 percent in 1996. To increase its market share, Radiomobil began offering long distance service in 1998 at half the SPT's rates through its mobile phone network.²⁵ The CTO was to award an additional 1.8-GHz license in 1998.²⁶

Overall in the Czech Republic new operators trying to enter the telecommunications market can count on a transparent regulatory framework and strong support from regulators. However, until the monopoly rights of the incumbent operators expire, new entrants must develop as niche players, concentrating on corporate clients. It will take time and considerable effort from government regulators before emerging companies can compete with the incumbent monopolist on a level playing field.

Telecommunications Reforms in Hungary

Hungary's telecommunications sector, like those in other CEECs, was not a public investment priority, and the impossibility of raising substantial funds in other ways led to a low level of network growth. From 1991 on, however, the rate of network expansion has accelerated to above 10 percent. The Hungarian network is expected to grow to about 3.7 million lines by the year 2000.²⁷ The waiting list for connection began to drop in 1994 (OECD 1997).

The fixed network consists of 54 primary networks, which comprise 1,500 local exchanges. Trunk facilities connect these primary networks to nine interconnected secondary exchanges. The only international gateway is located in Budapest. Telephone densities in Hungary decline in proportion to the distance from the capital, and peripheral regions in the eastern part of the country have the lowest.

Hungary was the first among the CEECs to introduce public mobile cellular services. In 1997 the country had the broadest cellular coverage in Central and Eastern Europe. Analog and digital service were available to virtually the entire population of the country at comparatively low tariffs.

Regulation and market structure. Hungary was the most successful of all the CEECs in building regulatory institutions. Under the Telecommunications Act of 1992 the concession contract is a major regulatory instrument in Hungary. Concessions are granted on the basis of competitive bids. The quality, quantity, and technical

²⁵ *Prague Business Journal*, November 2, 1998.

²⁶ Feasibility studies were to be carried out first, with the CTO deciding whether to award one national or two regional licenses.

²⁷ This corresponds to the teledensity of 36.2 lines per 100 inhabitants.

requirements of service as well as the penalties for violating these requirements, the terms of interconnection with other telecommunications providers, and the regime for setting tariffs are all effectively spelled out (OECD 1997).

The act deals with three types of telecommunications services: monopolized, partially competitive, and competitive. Telecommunications services supplied by monopolies or under limited competition are governed by a concession contract with the state regulatory authority. The concession contract with the incumbent monopoly operator Matav gives the company an exclusive right to provide international, domestic long distance, and some local public telephone services up to the year 2002.

While special regulatory rules apply to telecommunications services provided under concession contracts, rates for nonconcessionary services are subject only to the general fair-pricing principles outlined in the Competition Act. In early 1995 the government introduced price-cap regulation with the goals of establishing maximum tariffs for concession services and giving service providers adequate financial resources for network build-out. The act confirmed the prerogatives of the Ministry of Transport, Communication, and Water Management as the industry regulator. The General Communication Inspectorate is subordinate to the ministry and implements the technical aspects of regulating telecommunications industry in Hungary. According to the Frequency Management Act of 1993 the Ministry of Transport, Communication, and Water Management is also responsible for managing radio spectrum use. The Frequency Act established the National Frequency Management Council, which serves as an advisory body to the ministry. The Competition Council plays an important regulatory role in conducting antimonopoly policy, and any changes in telecommunications tariffs must receive the joint approval of the Competition Council and the Ministry of Finance.

Hungary separates the administration of the regulatory process from the operation of telecommunications networks, and particularly from the main operator, Matav. Regulatory and ownership functions are formally separated, as well. In December 1995 the Hungarian State Property and Holding Agency, which had been acting as majority shareholder in Matav, divested itself of the controlling stake, retaining responsibility for the 25 percent plus one golden share.²⁸ As a strategic owner the agency is not subordinate to the ministry and represents the shareholders' point of view in issues of Matav management (Szanyi 1997).

The process of separating the regulatory authority both administratively and legally from owners and operators of telecommunications networks was not supplemented with measures adequate to insulate the regulator from political pressure. Although the inspectorate has considerable freedom in implementing regulatory arrangements, its independence appears to stop well short of designing new policies. This

²⁸ Until December 1995 the Hungarian State Property and Holding Agency held 64.86 percent of Matav's shares. See "Telecommunications in Hungary" at the website of the Hungarian Ministry of Economic Affairs (<http://www.ikm.iif.hu/english/economy/industr/telecom.htm>).

arrangement may not be sufficient in the future. The overwhelming market dominance of the incumbent network operator and the comparatively high cost of market entry, particularly into network operation, create major difficulties. As a multi-operator environment develops, the need for strong independent regulation is acute.

Privatization, competition, and the emerging market structure. Hungary's pivotal choice was to allow a transitional monopoly mixed with competition. Early in 1993 the telecommunications ministry issued a tender for 30 percent of Matav's shares and the concession to provide long distance calls over Matav's digital overlay network, which had not been completed.²⁹ The concession provided six years' protection from competition on public long distance and local calls, beginning January 1, 1994.

To be eligible to take part in the tender, applicants had to satisfy minimum financial requirements. The winner in the tender was supposed to pay a concession fee to the Hungarian government for the use of the digital overlay network. In addition, the winner had to pay 0.1 percent of the future gross revenues into the budget.³⁰ The winner also had an obligation to guarantee at least a 15.5 percent annual increase in main lines for six years; satisfy 90 percent of the applications for main lines by July 1997; and satisfy 98 percent of the outstanding waiting list before the end of 1997 (OECD 1997). Opponents of the privatization plan argued that it was out of step with the EU's telecommunications rules, which provided protection for monopoly suppliers only until January 1998. Moreover, imposing the same protection period for long distance and local calls put local suppliers at a disadvantage. Local networks were still under development, while the overlay network had practically been completed. The critics therefore suggested a shorter period of protection for long distance calls (until 1998) than for local calls (until at least 2000).

Four consortia submitted their bids: France Telecom/U.S. West, STET/Bell Atlantic, Deutsche Telecom/Ameritech/Cable & Wireless, and Telefonica/Dutch PTT/GTE. The highest bid in the first round came from the STET consortium (US\$850 million), with the others offering between US\$450 million and 500 million. The offers differed in the proposed speed of network build-out. Taking network expansion into account, Deutsche Telecom had an advantage with its impressive record from former East Germany. Deutsche Telecom was widely expected to meet the standard EU level of teledensity (50 lines per 100 inhabitants) in only six years and at relatively moderate estimated cost of about \$30 billion.

After the second round of bidding, a group of experts from the ministry and the State Property Agency awarded the concession to the Deutsche Telecom-led consortium MagyarCom. In the end MagyarCom paid US\$875 million for 30.2 percent of Matav's

²⁹ Early in 1991 the postal, broadcasting, and telecommunications divisions of Magyar Posta were spun off as three independent limited-liability companies: Magyar Posta Vállalat, Magyar Műsorszóró, Vállalat, and Magyar Távközlési Vállalat (or Matav). Matav was subsequently restructured.

³⁰ The sale of 30 percent of Matav was expected to raise around US\$400 million.

shares. Of this, US\$400 million was to be in the form of direct investment in Matav's operating capital, and the remaining amount was to be transferred to the state budget and a special Communication Development Fund.³¹ In the end of 1995, MagyarCom expanded its share to 67.36 % as a result of the second round of privatization.³²

The result of this approach has been that 80 percent of voice services over the fixed public network are provided under monopoly conditions. However, like Argentina, Hungary has established a number of independent regional monopolies in local service rather than one national monopoly. The performance of one monopoly serves as yardstick for measuring the performance of the others.

Box 4. Privatizing Telecommunications in the Czech Republic and Hungary

The Czech privatization of SPT was similar to the Hungarian government's sale of Matav to a DT-led alliance MagyarCom. While both tenders generated comparable privatization revenues, the two governments found different uses for the funds. The Czech government used the privatization receipts to modernize the SPT, while the Hungarian government used the money to pay its debts and to establish a special communications development fund (Michalis and Takla 1997). The table below shows the primary differences in the two arrangements.

	Private stake	Strategic partner's offer	Amount
SPT Telecom	49 percent	27 percent strategic stake sold to Swiss–Dutch–American consortium TelSource in 1995.	US\$1.32 billion in FDI. US\$131 million in managerial software and other investment.
Matav	40 percent	67.36 percent stake sold to DT–Ameritech consortium in the first and the second rounds of privatization in 1993 and 1995. 26 percent of the shares was sold to private investors on the NYSE and Budapest stock exchange in 1997	US\$875 million.

Source: Michalis and Talka 1997.

DT = Deutsche Telecom

FDI = foreign

³¹ Compared to the firm's estimated market value (US\$3.3 billion), these figures suggest that Matav was sold off rather cheaply.

³² In November 1997, MATÁV was one of the first telecommunication companies in CEEC to obtain a listing on the New York Stock Exchange. In 1997, 26 percent of the company was sold to private investors in the NYSE and Budapest stock exchanges. Finally, in 1999, the Hungarian State Property and Holding Agency sold the remaining 5.5 percent stake of MATÁV held by the Hungarian government. See <http://www.matav.hu/english/world/info/history/>.

Of the 54 primary networks, MATAV controls 39. New independent companies acquired the other 15 networks in an open concession tender. These independent concession companies are controlled by five parent companies. At the end of 1994 networks belonging to independent companies represented only 12 percent of total telephone lines and were deployed in relatively underdeveloped areas that accounted for 22 percent of the country's population.

Wireless cellular networks expanded dramatically after two competing GSM operators won licenses. But competition in cellular and paging services will be limited until the end of the millennium, since the regulations give exclusive rights for these services to at most three operators in each area. Once this regulatory restriction expires and the high-frequency parts of spectrum are distributed to cellular service providers, the intensity of competition in the wireless telecommunications should increase. Through the commercialization of wireless local loop technology, this competition should also spill over to the local wireline segment of the industry.

Network build-out and performance. In the early 1990s local governments received the right to sell their public networks in tenders for monopoly concessions. This mechanism allowed local areas to attract additional capital and technical expertise. Until then Budapest had received preferential treatment (its teledensity limit was four times as high as in rural areas). However, between 1991 and 1995, Budapest's share of total access dropped from 45 percent to 34 percent. Although the average number of main lines per 100 inhabitants rose from 6.6 in 1984 to 21.1 in 1995, rural areas enjoyed a fourfold increase in teledensity.³³

Most aspects of service have steadily improved since regulatory reforms began in 1992. Although the actual levels in Hungary are still lower than OECD averages, certain indicators such as call completion rates and the number of fault incidences per main line are steadily improving.

The incumbent monopoly operator Matav has shown consistent improvements in the most important productivity parameters in 1990 to 1995. For example, during this period the ratio of main lines per employee grew from about 45 to almost 104, or about 131 percent. Revenue per employee has increased tremendously as well, rising from US\$20,000 to over US\$50,000 in 1992 alone. However, this parameter is still low compared with the OECD average of about US\$150,000 (OECD 1997).

Investment in the sector has also grown dramatically. By the end of 1994, annual investment in the public network had reached US\$400million to 500 million, with overall investment in telecommunications exceeding US\$730 million. Annual investment in the

³³ See "Post, Telecommunication, Broadcasting Reflected in Numbers (1991–96)" at the website of the Hungarian Ministry of Transport, Communication, and Water Management (<http://www.mav.hu/khvm/docs/postae/text.htm#a3>).

industry is close to 0.8 percent of the GDP—significantly higher than the OECD average of 0.5 percent and higher than any other CEEC (OECD 1997). Investment per main line is US\$420, about twice the OECD average. Since 1992, per capita investment in public telecommunications service, including both fixed and wireless networks, has risen from US\$32 (1990) to US\$73 (1994). This amount is still lower than the OECD average but rivals the levels of such EU members as the Belgium, Greece, Ireland, and the United Kingdom.

Telecommunications Policy in Poland

Poland is the largest of the CEECs, with a population of 40 million. Its dramatic story of transformation and transition shows how the details of interconnection and regulatory processes are vital to creating an efficient market.

Despite the fact that Poland has the largest telephone network among CEECs (7.5 million main lines), it also has one of the lowest teledensities in Europe: 19.32 lines per 100 people.³⁴ During more than four decades of mismanagement by the communist government, telecommunication infrastructure had been built up extremely slowly. The COCOM (Coordinating Committee for Multilateral Export Controls) embargo was a major impediment for Poland in gaining access to the modern technology. As a result the industry's technical base is very backward, and a significant number of manual exchanges are still in use. The incumbent operator, TPSA [Telekomunikacja Polska Spolka Akcyjna], needs 18,000 of its 72,000 employees just to operate and maintain the manual exchanges (Kubasik 1997). Only about 65 percent of lines are digitalized, and penetration in some rural areas is as low as 4 percent.

At the time of the enactment of the new telecommunications legislation, the political influence of the incumbent monopoly had significantly weakened, because it was considered a communist organization. (Consumers and new entrants had not yet organized themselves politically, however.) The Polish Telecommunications Act—adopted in 1990 and amended in 1991 and again in 1995—was the first postcommunist telecommunications act among CEECs. The act formally liberalized local networks: A license from the Ministry of Posts and Telecommunication was the only restriction on the entry of new local operators, which could be domestic or foreign companies.

Separating the postal and telecommunications functions in January 1991 resulted in the formation of the TPSA. Currently, the industry is regulated by several institutions: the Ministry of Communications, the State Telecommunications Inspectorate, the National Radiocommunications Agency and the Antimonopoly Office. There is no specialized independent body to facilitate harmonization of regulatory activities in the industry or to accumulate and disseminate regulatory expertise.

³⁴ "Poland: Land of Opportunity on a Troubled Battleground." *European Telecommunications*, February 20, 1998, vol. 16, no. 4.

The Polish laws did not clearly separate the Minister of Communications' functions as industry regulator and owner of the incumbent operator. The possibility of a conflict of interest existed—a conflict that would be inconsistent with EU rules, which explicitly require that operating and regulating functions be separated. The minister, who also represented the only shareholder in the TPSA, was in charge of issuing the licenses to its competitors. In implementing the Association Agreement commitments to EU in March 1997, Poland took a step in the direction of harmonizing its telecommunications regulation with that of the EU by transferring state ownership interests in TPSA to the Treasury. Taking the telecommunications operator out of the ministry structure and transforming it into a joint stock company controlled by the Treasury were certainly steps in the right direction. But regulatory authority still lies with the Ministry of Communications. Much remains to be done to eliminate the conflicts of interest arising out of historical links between the Ministry of Communications and the structures that eventually have taken the form of TPSA.

In September 1998, the Polish Securities and Exchange Commission admitted the first bloc of TPSA shares to public trading. On November 18th of 1998, the TPSA shares were offered on the primary markets in the WSE (Warsaw Stock Exchange) and in the form of global depositary receipts on the London stock exchange. In spite of the turmoil on the global emerging markets following the 1997 financial crisis, the IPO was very successful. The combined offering of 210,000,000 shares represented 15% of the company's capital. At the initial trading session, the TPSA stock traded at PLN 16.90 per share (or US\$ 4.94).³⁵

In March 1999, the Polish government approved an amendment to the Communications Act enabling the sale of addition 25% of the TPSA stock to the strategic investor. One of the government's major concerns was that fully liberalizing all telephone services might have a detrimental effect on the TPSA's share price at the time of the initial stock offering. This concern explains the government's policy of balancing the need to comply with EU competition requirements with slow liberalization. Given the recent history of telecommunications reforms in other countries, Poland probably could not support a market with multiple operators without damaging the TPSA's valuation.³⁶

Poland's privatization story shows why it is hard to instill market confidence in the authorities supporting competition. The problem has no perfect solution, but creating

³⁵ See http://www.tpsa.pl/english/inwestor/inwestor_02.html

³⁶ The World Bank research indicates that uncertain and weak regulatory and legal frameworks sometimes can be stronger predictors of the poor privatization proceeds than the existence of competition. Foreign investors are willing to pay premiums for shares in high-potential companies in growing markets even under competitive pressure (see the "The World Bank Group Telecommunications Strategy in the Europe and Central Asia Region," Discussion paper, June, 1999, http://www.worldbank.org/html/fpd/telecoms/subtelecom/eca/telecom_ECA_strategy.htm). We thank Anna Bjerde from the World Bank for pointing out the results of this research to us.

an independent regulatory authority was one way to help the liberalization of the Polish telecommunications industry succeed.

Facilities-based competition and interconnection policy. Polish policy supports competition. According to the Telecommunications Act of 1990, existing network operators cannot refuse to connect another network to their own. Has competition emerged as a result of this policy? The answer is “to a degree.”

The TPSA inherited the Polish national telecommunications network with its 7.5 million subscribers. The company has retained a monopoly on lucrative long distance and international services, despite its formal liberalization under the 1990 Telecommunications Act. Although the act stipulates that any company with a home majority stake in its capital can become a long distance network operator, no Polish company has enough capital to build out a new network without a major contribution by a foreign partner. However, since foreign participation is not allowed in international networks, the act essentially preserves the incumbent operator’s monopoly on long distance and international networks. The act also gave the TPSA a significant competitive advantage over new operators. In applying for licenses new operators must present a formal strategic development plan to the Ministry of Communications and pay certain fees. The TPSA does not have to declare its strategic plans and gets licenses free of charge.

The TPSA uses revenues from long distance and international services to subsidize local rates. It is expected that its monopoly on domestic long distance traffic will be lifted in 1999. The long distance tender is due to be announced around the end of 1998. But the TPSA will retain its lucrative monopoly on international calls until the end of 2002, and foreign investors will be limited to a share of 49 percent in new operators.

In 1996 the Polish Anti-Monopoly Office (now known as the Office for Competition and Consumer Protection, or CCP) became concerned that the TPSA was charging excessive interconnection fees to cellular operators and new local operating companies. The CCP proposed a solution that has proven popular in many countries. New operators would be allowed to interconnect with the networks of major public utilities, the national power grid, and state railways. With nationwide networks already in place, rights of way for new transmission facilities in hand, and foreign partners already lined up, these utilities can become direct competitors to the TPSA.³⁷ These utilities have their

³⁷ The National Power Grid (PSE) has 5,000 miles of fiberoptic cable deployed along its power distribution networks and has invested US\$70 million to install additional digital lines. Tel-Energo SA, a joint venture between PSE and several regional power distribution companies, has a license to lease switches and provide telecom services to the energy industry and plans to provide local telecom services in several areas in Poland. The PSE and its subsidiaries have already acquired significant operating experience through their involvement in a cellular consortium that includes AirTouch and TeleDanmark. Additionally, Tel-Energo executes about 30 percent of all interbank transfers in Poland. Tele-Energo also has plans to carry CATV services among Poland’s numerous urban cable networks when the TPSA loses its monopoly status. Another potential competitor belongs to the Polish State Railway (PKP), which leases switches and

own legacies as monopolists, and the decision to designate them as competitors to the dominant phone company may be as much a matter of politics as markets.

Until the TPSA loses its position as monopoly carrier, all local operators must use its trunk network for interconnection. The act states that the terms of the interconnection agreements should be stipulated in a civil contract between operators of interconnecting networks. But it does not explain what happens when the parties are unable to reach an agreement. If the TPSA wants to prevent the entry of a competing network operator, then, it can simply delay negotiations on the terms of interconnection.

Ambiguous and inadequate regulatory legislation, together with the lack of a truly independent regulatory body, has allowed the TPSA many opportunities to take unfair advantage of its position. Delaying interconnection agreements is not the only method the TPSA has used to deter the entry of independent local network operators. According to Kubasik (1997) the TPSA has sometimes deployed small exchange offices that connect only the largest business customers in the given localities. This strategy cripples the business plans of many independent local entrants that need revenues from business customers to recover costs. Once the new operators have given up, the TPSA usually stops building up its capacity in the area, leaving the region significantly underdeveloped. This practice is one of the reasons so few operators have actually started providing services, despite the fact that more than 70 permits have been issued. The TPSA's tactics have prevented new entrants from gaining a bigger share of the Polish market. As a result people still have to wait as long as two years to get a telephone line in Poland.

In short, the existing Polish policy falls short of EU guidelines for interconnection. It does not provide for specific negotiation procedures and timetables for interconnecting parties. It lacks ground rules to guide interconnection decisions (a reference offer in EU terminology) that include a basic methodology for costing interconnection. And of course Poland has yet to establish an independent regulator that can arbitrate when negotiations come to a stalemate.

Despite the TPSA's clear advantage, however, competition does exist in important segments of the Polish telecommunications market. There are about 200 new data/value-added service operators, 400 new cable TV operators, and various new VSAT and private corporate networks. There are around 70 new local operators, and more than 100 interconnect agreements with local operators have been signed to date, although few are up and running. The mobile telephone services market has been competitive since 1996. While the number of subscribers is accelerating rapidly, the market has developed relatively slowly because of the decision to slow down the introduction of competition. The two GSM operators started their services only in the autumn of 1996, and another

provides basic voice services for the railway utilities. The company had 200,000 subscribers as of March 1997 and operates a network with 1,500 miles of optic cable. PKP has the capability to extend its own telecommunications system to cities throughout Poland (*Communications International*, March 1998, vol. 25, no. 3, pp. 43-48).

competitor holds the old NMT analogue license and offers a digital service under the first GSM 1800 license granted in Poland.^{38,39} With around 900,000 subscribers Poland has become the largest cellular market in Central and Eastern Europe, but in penetration levels it is still far behind Hungary and the Czech Republic.

Universal service and national network buildout. Sheltering the TPSA has not produced a miracle in network modernization, but rates of network expansion and indicators of efficiency have improved. The Polish telephone network is one of the fastest growing in the world, averaging 12 percent growth per year. More than 1.7 million new lines were installed during 1991 through 1994, but the telephone subscriber waiting list exceeded 2 million in 1995. The average call completion rate nation-wide is 40 percent, but in Warsaw, significantly worse with only 25 percent (Kubasik 1997).

The most striking aspect of the Polish story in regard to universal service is rural service. Most recent improvements in the telecommunications network have benefited urban rather than rural areas. Although 36 percent of the population lives in the countryside, rural inhabitants have access to just 13 percent of exchange lines. Teledensity in rural Poland is only 4.6 percent, but in urban areas it is 18.2 percent. In 1994, more than 2,300 villages (4 percent) were still without a single telephone line. The telephone network deployed in rural areas is very outdated: 43 percent of the telephone throughput of rural areas is handled by manual exchanges, most of which operate for fewer than 24 hours a day (Kubasik 1997; Sallai, Schmideg, and Lajtha 1996).

The TPSA expanded its network primarily in urban areas because the economies of density and scope are more pronounced and the return on investments in new network is higher. The inhabitants of many residential and rural areas organized themselves into telephone cooperative groups consisting of several dozen to several hundred members. Members of such cooperatives typically acquired the rights of way on the local land and prepared it for the ducting with their own resources. The newly built local networks were then transferred to the TPSA, which compensated the cooperatives' members by granting them free units on their long distance bill.

Given the scarcity of capital for developing telecommunications infrastructure in the rural areas, cooperatives represented a quick and unorthodox way of raising funds for building out rural networks. They mobilized the capital reserves of local communities in unserved areas. The Polish government considers the development of local telephone cooperatives the least costly means deploying rural telecommunications deployment

³⁸ Polska Telefonia Cyfrowa (PTC) operates under the brand-name of Era GSM. It includes US West and Deutsche Telekom, each of which holds 22.5 percent, as its main foreign investors. It already claims more than 300,000 subscribers and will have invested around US\$500 million by the end of 1998 in a network covering around 80 percent of the country and 90 percent of the population. Its main rival Polkomtel, which operates the Plus GSM network, is close behind, with nearly 300,000 subscribers. Its main investors are the U.S. group AirTouch and TeleDanmark.

³⁹ Centertel, which is owned 66 percent by TPSA and 34 percent by France Telecom, holds the license. *Financial Times Survey*: Poland, March 25, 1998, p. 8.

rapidly. Over the last few years nearly 60 percent of the new main lines in rural areas have been developed in this framework (Hudson 1997; Prössdorf 1997; Kubasik 1997; Petrazinni 1995).

Telecommunications Reform in Four Latin American Countries

During the 1990s many Latin American countries restructured the government agencies responsible for regulating national telecommunications markets and services. In many cases these governments have created independent organizations to regulate, monitor, and guide the liberalization of their telecom markets.

Many Latin American economies also made market access commitments at the 1997 WTO agreement. We focus on four of them: Argentina, Chile, Mexico, and Peru. Chile and Mexico opened basic telecom service to competition and foreign ownership prior to the January 1998 “start date” for the WTO convention. Both Argentina and Peru sold off their state telecom firms to private concerns in the early 1990s and plan to allow full competition in 1999. All four countries have made efforts to align interconnection charges with long-term incremental costs and have begun to erase cross-subsidization between local and long distance rates.

Argentina

The struggle to introduce privatization and competition in Argentina was contentious. A presidential decree was needed to introduce competition in mobile wireless services in 1988 (Petrazinni 1996). Privatization of the state-run company (Empresa Nacional de Telecomunicaciones) began in 1990 with the creation of two new national operators, which do not compete. Telefónica de Argentina, controlled by Telefónica de España and CEL Citicorp Holdings, became the monopoly provider of local, long distance, and international services in the southern region.⁴⁰ Telecom Argentina, controlled by France Telecom and Italy’s Stet SpA, acquired the monopoly concession for similar service in the northern region. The Buenos Aires market was split between the two operators.

A second decree in 1996 created the Comisión Nacional de Comunicaciones (CNC) from existing federal bodies. The new agency is intended to ensure the continuity, regularity, and equality of services and to promote to universal service at fair and reasonable prices through effective competition (in services that are not currently exclusive). CNC’s predecessor organization had been buffeted by continuous upheavals in its leadership. (Petrazinni 1996), and CNC has not escaped them all. Theoretically, however, its authority is still broad. Its duties include:

- Administering the National Telecommunications Fund, which is financed by contributions from telecommunications operators (0.5 percent of gross revenues);

⁴⁰ International services are provided through Telecomunicaciones Internacionales de Argentina (Telintar).

- Granting licenses and permits for telecommunications operations; setting norms and regulations for telecommunication services, including quality standards, technical fundamentals, and network interconnection policy;
- Regulating the behavior of the market for exclusively provided services (including rate approval and management through a price cap system), keeping regulation to a minimum for services open to competition;
- Approving interconnection contracts and resolving discrepancies that may arise during contract negotiations, administering the electromagnetic spectrum (as a scarce resource), assigning frequencies with the goal of optimizing spectrum use and promoting competitive conditions; and
- Applying sanctions to firms that do not comply with CNC regulations.⁴¹

Despite foreign investment in its carriers, Argentina was for a long time very sensitive to anything that suggested loss of national sovereignty. For example, Argentina was the only major country in South America to avoid all commitments on value-added services in the Uruguay Round's initial agreement on telecommunications in 1993. The United States and Europe had to work hard to convince Argentina to change its policy in the 1997 WTO deal. But in the end Argentina made quite a good offer on market access. This offer included foreign ownership or control of all telecommunications services and facilities beginning in 2000; guaranteed market access for satellite services and facilities (domestic and international) beginning in 1999; and guaranteed procompetitive regulatory principles. Services other than voice services (domestic, long distance, and international) are open to competition.

In a major shift in policy, the CNC agreed to gradually liberalize voice telephony, with the goal of full competition by November 2000. The two new telecom companies had originally received exclusive seven-year licenses that were renewed for a period of three years in November 1997. However, in March 1998 the CNC announced that it would allow two new basic service providers to initiate operations in November 1999, ending the monopolies one year early. The two incumbents have requested \$200 million in compensation for the early end to exclusive rights (Schneider 1995). The CNC granted licenses to CTI, a mobile operator controlled by GTE and Grupo Clarín, and Movicom, a mobile operator controlled by BellSouth and Motorola. Telefónica and Telecom will be free to offer services in the regions where they do not currently have exclusive rights (Jarvie and Keaveny 1998). Additionally, Impsat, Kedata, and Comsat acquired licenses for long distance and international services beginning in November 2000 (Impsat will offer only commercial, not residential, service) (Jarvie and Keaveny 1998; Canton 1998).⁴² Applicants for new basic service licenses had to be existing providers of cellular, cable television, or local independent telephone services in Argentina.

An important part of Argentina's preparation for competition was rate

⁴¹ More information on the CNC can be found at www.cnc.gov.ar.

⁴² "Los Cambios, tras la Liberación del Negocio." Clarín, June 17, 1998. Accessible at www.Clarin.com.ar/diario/98-06-17/o-03102d.htm.

rebalancing, which began in earnest in 1996. The country had very high rates for long distance services that severely restricted demand and encouraged call-back services. At the same time, rates for local services were very cheap. While the adjustments were imperfect, especially for international calling, rebalancing made it easier to consider competition.⁴³

Argentina further prepared for the liberalization of the basic service market through the passage of the General Interconnection Regulation in January of 1997 and the Basic Telephone Services Decree in March of 1998. The Interconnection Regulation required all providers with essential facilities to offer nondiscriminatory interconnection and to set charges at 78 percent of revenues of outgoing traffic. When exclusive concessions end in 1999, interconnection charges are to be based on the long-term incremental costs of unbundled services.⁴⁴ Argentina shrewdly decided that until dominant providers can provide long-term incremental cost information, charges will be fixed by the CNC using comparable conditions and charges from the following countries: Australia, Chile, France, Germany, Italy, Mexico, New Zealand, Peru, Spain, United Kingdom, and United States. Although not all these countries have set their final rates, this basket should yield interconnection charges on the order of US\$0.03 per minute, significantly higher than the United States but close to the upper range in the EU.

Equally significant was the approach to advancing universal service. The most significant portion of the Basic Services Decree was the requirement that all basic service providers install a wireline network or wireless local loop in all locations with more than 500 inhabitants. They must also install these facilities in any location where at least 30 clients request service during the transition period (before November 1999).

Argentina's liberalization has led to tangible improvements in basic services as existing firms prepare for a competitive market. In terms of network enrichment and expansion, Telefónica invested US\$1.28 billion between October 1996 and June 1998 and US\$6.37 billion since it began operations in November 1990. During the past year Telefónica has focused much of its investment on digitalizing its network, achieving 100 percent digitalization in June 1998 (compared with 82.5 percent in December 1996). Likewise, lines in service increased by 12.4 percent between December 1996 and June 1998 (representing a teledensity increase from 21.4 to 23.8). During the past two years the firm has also become more efficient, increasing lines in service per 100 employees from 256.1 in December 1996 to 335 in March 1998 (an increase of 29.8 percent).

Telecom has also made significant network improvements since 1997. Total investment for 1997 was US\$502 million (\$5.2 billion since 1991). Full digitalization

⁴³ One analysis put Argentina's rates in the spring of 1996 at one-quarter of Mexico's level for local services and at almost five times the level for domestic long distance services. Rates for international calling were twice as high (Oppenheimer and Company, International Research, market research report on Telecom Argentina, May 1996, p. 5).

⁴⁴ For more information, visit www.cnc.gov.ar/resol/r_49_97.html, www.cnc.gov.ar/resol/r_61_97.html and www.cnc.gov.ar/resol/r_98_0264.html.

was achieved by the end of 1997 (up 4.5 percent since the end of 1996). Lines in service increased 9.3 percent during 1997 (from 17.1 to 17.7 per 100 inhabitants). Lines in service per employee also increased from 218 at the end of 1996 to 277 by December 1997, a gain of 27 percent. Meanwhile, the already competitive market for wireless services doubled in 1997 (Lapper 1998).

Chile

Chile was the first Latin American country to take significant steps toward liberalizing its telecommunications market. Prior to the 1980s the state-owned Compañía de Teléfonos de Chile (CTC) controlled about 90 percent of lines in service. However, by the 1990s Chile had begun to allow competition in all telecommunication services through the auspices of the Subsecretaría de Telecomunicaciones (Subtel), the regulatory body created in 1977. Subtel has been effective in requiring cost-based interconnection charges and encouraging competition in the basic service market by regulating rates.

Although Chile, like Mexico, has a surcharge on incoming international traffic for the purposes of interconnection, the surcharge has not resulted in a bitter policy struggle. One reason it has not is that the traffic imbalances with other countries are much smaller than they are for Mexico. The traffic ratio with the United States is about 1.5 of incoming traffic for every minute of outgoing, much lower than Mexico's three-to-one ratio (Staple 1998). However, the settlement rate itself is higher—about US\$0.36 per minute in 1998. The cost of the net settled minute for a U.S. carrier, then (after adjusting the rate per minute to allow for income from return traffic from Chile), is about US\$0.18 instead of the roughly US\$0.70 for Mexico. This fact makes the effect of the surcharge on the average cost of interconnection in Chile much less important than it is in Mexico.

During the last few years the Chilean basic service market has witnessed the exit of a number of firms and is now controlled largely by four major carriers: the CTC, Entel, Chilesat, and BellSouth. Although competition exists for local and long distance services, it is clearly much more vigorous for long distance. Entel, the dominant carrier in long distance, has lost a 60 percent share of the market. The CTC remains by far the most important carrier in the country because of its overwhelming control of the market for local phone services.⁴⁵ While interconnection charges of US\$0.06 per minute for domestic long distance calls suggest that regulators have yet to bring full cost-based interconnection to the market, Chile's regulators have generally put in place most of the key elements of a successful interconnection policy for local and long distance services.

The Chilean case supports the theory that a viable option for open competition in

⁴⁵ The CTC controls 92 percent of the local market. The market share for domestic and international long distance is split among the four firms (Entel, 40 percent; the CTC, 33 percent; Chilesat, 16 percent; and BellSouth, approximately 10 percent). Entel has joined with Motorola to build a national PCS network to offset its declining share of the long distance market. See *Estrategia*, August 25, 1998 and October 27, 1997; the BellSouth International website, www.bsi.bellsouth.com; and Maria Lourdes Kasilag Smith, M. or P.—both are 1997 in the References.

local services combined with vigorous entry in long distance can result in extensive investment in expansion of all parts of the network. The CTC cannot assume that it will remain dominant in local services. The ITU projects that Chilean basic service providers will invest US\$3.4 billion in 1996 to 2000. This number is relatively impressive given Chile's small population (approximately 14 million). High levels of capital investment have resulted in tangible increases in the number of lines in service in Chile, and teledensity rose from 13.2 lines per 100 inhabitants in 1995 to 17.8 lines per 100 in 1997, an increase of 35 percent over the two-year period (ITU 1997).⁴⁶

Perhaps the most remarkable feature of Chilean policy is its approach to funding universal service, which features the use of an auction to distribute subsidies for service in rural areas with low teledensities. In effect, the regulator sets aside a certain amount of money to encourage network build-out. The carriers then bid by offering packages for network construction and service using the subsidy. The best offer gets the subsidy. This approach creates significant incentives to lower costs for universal service and speeds up the deployment of new network build-out in low teledensity regions. It also makes the subsidy to carriers more competitively neutral, because the auction gives rivals a chance to bid away any potential rent for the winner.

Mexico

Mexico was one of the early reformers of telecommunications markets in South America. It privatized its monopoly carrier Telmex in 1990. Two foreign investors, Southwestern Bell and France Telecom, took a minority interest in the new organization, which was headed by a prominent Mexican conglomerate, Grupo Carso. Privatization was the catalyst for a considerable pickup in the pace of network investment, management reforms, and work practices designed to increase productivity (Ryan 1997).

In the wake of the peso crisis of 1994, the Mexican government decided to use telecommunications reform to signal its determination to make the country attractive to foreign investment and to continue market-oriented reforms. In 1994 it drafted and passed—in a remarkably short time—legislation to permit competition in voice telephone services. Telecommunications seemed a particularly ripe market for the move. Despite an uncertain economy, the enormous flow of communications traffic between the United States and Mexico was certain to draw the interest of U.S. carriers. Moreover, Telmex was in good financial condition, so competition would not unsettle the stock market. (Telmex is a significant part of the total capitalization of the Mexican stock market.)

The start of competition in the long distance market seemed to be the crowning success of the government's reform policy. The Mexican government ended Telmex's monopoly concession for domestic and international long distance on January 1, 1997,

⁴⁶ See also the ITU website, www.itu.int.

when 6 entrants initiated service in 60 of Mexico's largest cities.⁴⁷ MCI and AT&T are part owners of the largest of the new providers, Alestra and Avantel (45 and 49 percent, respectively).⁴⁸ Local service opened to competition on December 29, 1998. Iusacell, controlled by Bell Atlantic International Wireless, was Telmex's most prominent competitor in the cellular market.

As competition was rolled out in many Mexican cities, it created a rush of subscribers. Nearly 4 million people signed up for long distance service during the first half of 1997: 55.7 percent with Telmex; 24.9 percent with Alestra; 18.6 percent Avantel; and approximately 1 percent with either Iusacell, Miditel, or Protel. By the end of the first year, new entrants had claimed about 25 percent of the contestable long distance market (parts of the market would be rolled out later to competition) and 18 percent of the total long distance market. Long distance prices dropped by roughly 30 to 40 percent. Furthermore, the initial burst of enthusiasm led to an increase in subscribers of 135 percent. Total lines in service increased by 8 percent in 1997 to 1998, although Mexico's teledensity figure has remained relatively constant during this period at 9.8 lines in service per 100 inhabitants.

Another significant reform for the market was the introduction of auctions to assign licenses for wireless spectrum. A successful auction can increase the speed and transparency of assigning licenses and maximize the potential for new entrants, who are free to adopt market-based strategies. Increasing the number of licenses eliminates the possibility that a limited number of licenses will produce inflated profits, increases investment flow, and generates substantial auction revenues (Mexico collected more than US\$1 billion in auction receipts). Mexican auctions in 1997 and 1998 created 77 licensees in 9 regions covering all of Mexico, including wireless local loop and personal communications services (PCS) concessions.⁴⁹ The auctions also made large parts of the country's microwave network available to the new entrants in telephone services.

The new holders of PCS licenses plan to roll out services by the end of 1998 or early 1999. Doing so will further intensify competition in a market where one competitor, Iusacell, doubled its subscriber base to 550,000 in 1997 through the use of prepaid service cards (Lapper 1998). Allowing entrants like Iusacell to bundle wireless local loop with PCS also offers the hope of significant network build-out for local services. Cofetel hoped that it might double teledensity levels for Mexico.

The careful transition from privatization to competition was in many ways a textbook for reform. But at least three significant problems remained as competition got underway. These problems played out in a particularly difficult way because of problems

⁴⁷ With certain limited exceptions on satellite services and foreign investment, Mexico committed to opening its market in full, subject to WTO guidelines. As in other reform-minded countries, the regulatory agency had been a strong proponent of such commitments, as it hoped to lock in its market reforms.

⁴⁸ Under Mexico's WTO commitments, majority ownership of basic service firms is capped at 49 percent.

⁴⁹ Most regions had four wireless concessions for fixed local loop services, two 30-Mhz PCS licenses, and two 10-MHz licenses (Biddlecombe 1997; Baldwin 1998a).

with the Mexican regulatory process.

The regulatory process. The ambition and speed of Mexico's reforms, particularly given its pioneering role as a developing economy in adopting such sweeping competition, was remarkable. But the tight time schedules for new regulations and implementation also created difficulties that the division of authority under the British model of regulation further complicated. The problems in Mexico are important precisely because they illustrate what can go wrong in a process that was in many respects a model for reform.

When Mexico began implementing competition, the Secretary of Communications and Transportation (SCT) oversaw the distribution of telecommunications licenses and was in charge of setting the rules for competition. In 1996 the undersecretary in charge of communications became the head of the new independent regulatory commission COFETEL (Comisión Federal de Telecomunicaciones). In practice, there was considerable overlap in authority. But COFETEL could not enforce its rules without the SCT's consent. Further compounding the problem was the Mexican regulator's fears that its program for rapid policy and market changes could fall significantly behind schedule if it ended up in the Mexican court system. Therefore, COFETEL emphasized negotiations rather than regulatory intervention and made final decisions only when disagreements arose.

The speed of the process and the penchant for negotiation undercut the transparency of the regulatory process. New entrants did not complain of any improprieties in the process and repeatedly expressed admiration for the expertise of the Mexican regulators. They did object to the fact that an informal process with a minimal written record and few written explanations of decisions tended to favor the incumbent operator. A formal procedure in a transparent framework, they argued, would limit the power of the incumbent, because the dominant carrier would have to choose one justification for its policy and then stick to it.

In 1997 the Mexican Competition Commission stepped forward to express similar views. And in 1998 the new head of COFETEL emphasized that it was consolidating authority at COFETEL in order to address concerns over the transparency and enforcement of regulatory policies.

Rate rebalancing and interconnection policy. Two policy issues dominated the introduction of competition. Rate rebalancing and interconnection policy became almost inseparable challenges. Despite Mexico's long-standing plans, rate rebalancing for local services had been thrown off schedule by the peso crisis. Telmex was thus able to argue that the economics of interconnection had to reflect this shortfall in fulfilling government commitments on interconnection. A more specialized form of the rate rebalancing issue applying to international phone services further complicated the issue.

Virtually all of Mexico's international telephone and fax traffic is with the United

States. So heavy is this traffic that it constitutes the second largest international route for the United States. The amount of traffic originating in the United States (around 2.7 billion minutes of traffic) is about three times greater than the traffic originating in Mexico (890 million minutes of traffic). And like virtually all settlement rates outside the industrial world, the settlement rate between two countries was vastly above cost (it stood at US\$0.39 per minute in 1997).⁵⁰ As a result, U.S. carriers paid over \$700 million per year in net settlement payments to Mexico in 1997, their largest payment to any country in the world. If competition in Mexico threatened this income stream for Telmex too quickly, Telmex it would resist fiercely.

At the same time, as in other countries, structuring mutually acceptable cost-based interconnection charges proved difficult. Prior to competition (April 1996) Telmex and Cofetel had agreed to interconnection charges (Nye 1998). However, in 1997, Cofetel, Telmex, and the other Mexican carriers were unable to settle on a mutually agreeable interconnection charge.

By the spring of 1998, Mexico had largely rebalanced local rates. Indeed, at rates averaging US\$25 to US\$30 per month for basic local service, it has one of the highest rates in the Americas. Local service generates a high levels of positive cash flow for Telmex and substantial profits.⁵¹ The company will be sheltered from competition in this market for some time, because entry into local services is always the longest and hardest task for new competitors. Thus, in theory Telmex has had ample time to adjust to cost-based interconnection rates and lower long distance rates. And in theory quite a bit of progress has been made on interconnection charges, except for the largest source of profits in the market—international services.

In 1996 Telmex persuaded the Mexican regulator to impose a 58 percent surcharge on the international settlement rate for incoming calls from the United States (58 percent of the settlement rate, or US\$0.228 per minute in 1997). Chile had a somewhat similar surcharge that had not deterred market entry. If there were no surcharge, Telmex argued, new entrants would be tempted to focus only on customers generating lots of international traffic with the United States. By winning a share of these customers, the entrants would successfully “skim the cream” off the Mexican market and wind up serving only the profitable international market.⁵²

⁵⁰ Unlike many countries, Mexico has never argued that this rate is based on costs. While disagreeing with the United States on the precise cost of international traffic, Mexico has always emphasized that the real issue is rebalancing rates, including settlement rates, on a timely and fair basis.

⁵¹ Unless all the embedded historic costs of Telmex are considered—most regulatory authorities in countries with competition do not accept these costs as appropriate. The positive cash flow, which is far more critical, exists no matter how embedded costs are treated.

⁵² This complaint mirrors one U.S. carriers make against some foreign carriers entering the U.S. market. Both Mexico and the United States have a proportionate return rule for international traffic. Simply stated, this rule says that AT&T, for example, is entitled to the same share of voice telephone traffic from Mexico that it sends to Mexico. If AT&T has a 50 percent share of voice traffic to Mexico, the rules says that it must receive 50 percent of the traffic from Mexico to the United States. With inflated settlement rates, it

The regulator believed it had to forestall this possibility by reducing the margin on incoming international traffic. Unfortunately, this decision effectively significantly raised the average interconnection cost. Including other one-time and miscellaneous fees, one competitor in the Mexican market estimated the average cost of interconnection per call at US\$0.078 per minute. Although the regulator expected to phase out the surcharge on international traffic in two or three years, new entrants had no faith in a general unofficial promise and little patience with the interim costs. Meanwhile, as has happened in most markets with the introduction of competition, there were significant problems with obtaining timely provision of interconnection with Telmex facilities.⁵³

In February 1998, Alestra first presented a grievance to Cofetel concerning interconnection, especially the surcharge. Avantel had filed similar petitions in January, February, and April 1997. During 1998 both MCI and AT&T filed complaints with the U.S. government requesting that a grievance be filed at the WTO concerning this issue and interconnection policy in general (Baldwin 1998b). On March 5, Avantel filed a court complaint in a Mexican court to expedite a ruling over interconnection (Garcia 1998a). On April 21 the Mexican court allowed Avantel to suspend payments of the 58 percent settlement surcharge it owed Telmex until another court decides if the fee is justified. Cofetel responded to Avantel's petition by expanding the number of fees Telmex could charge other operators for use of its network including, additional costs for failed call attempts and a new charge for switching center interconnection. Earlier in April, Cofetel did order operators to unbundle accounting statements to determine costs for individual services (Garcia 1998b).

In June Telmex presented a complaint to the Attorney General's office denouncing the suspension of payments. Telmex reported that Avantel owed the firm 240 million pesos (approximately US\$28 million) in interconnection payments.⁵⁴ However, Telmex's complaint was rejected the following month.⁵⁵ In mid-July all long distance operators except Avantel formed a coalition to continue negotiations with Telmex to set interconnection charges (Navarrete 1998). Finally, on August 25 Telmex signed an agreement with Cofetel eliminating the 58 percent surcharge. Telmex also agreed to consider establishing interconnection fees at \$0.027 per minute beginning on September 23 and lasting until December 31, 2000.⁵⁶ Even though the surcharge disappeared, there

makes sense for a new entrant in Mexico to discount aggressively in order to win outgoing traffic to the United States.

⁵³ The issues about provisioning are so common to all markets that regulators can simply anticipate them. As a matter of degree those existing initially in Mexico were far worse than normal, although the situation improved in the second half of 1997.

⁵⁴ "Panorama Empresarial," *Excelsior*, June 8, 1998.

⁵⁵ "Tribuna Rechaza Queja de Telmex," *Excelsior*, July 7, 1998.

⁵⁶ By November Telmex and its competitors were again unable to reach a final settlement on interconnection rates, and Cofetel announced that it would set the charge for 1999. A spokesperson for Alestra claimed that the interconnection charges Telmex was proposing included an allowance for recovering costs for network infrastructure and represented a figure five times greater than actual interconnection costs. In December 1998, Cofetel affirmed that the rate of \$US0.0272 would apply for

was still a disagreement over the level of the settlement rates. Telmex agreed to comply with the U.S. Federal Communication Commission (FCC) price cap of 19 cents per minute that would be applied in January 2000. But the company objected to making any significant reductions before that date.

The delay in implementing interconnection reform could have a prejudicial effect on overall network expansion, especially as Mexico prepares for competition in the local service market. In February 1998, Avantel announced the postponement of a US\$900 million expansion plan covering the origination of traffic from 100 cities. Avantel claimed that high interconnection fees would make the investment unprofitable. Avantel has already invested US\$600 million in the construction of its fiber-optic network in Guadalajara, Mexico City, and Monterrey, and plans to spend an additional US\$1.2 billion on network construction (Garcia 1998a). It is also feasible that interconnection charges inconsistent with actual costs could affect other firms' investment plans. Over the next five years Mexican basic service providers have projected investments of more than US\$8 billion (Avantel and Alestra, US\$1 billion; Iusacell, US\$1.2 billion; and Marcatel US\$2.5 billion).⁵⁷

In many respects Mexico has made a remarkably swift and skillful shift from a traditional monopoly to a fully competitive market. Its regulations are often worthy models for all other countries. But interconnection policy is hard even when the regulator wants to achieve economically efficient costs and serious rate rebalancing and the dominant carrier is in good financial condition. The enormous profitability of the market in international services is a particular challenge for regulators, because it creates inefficient incentives for both the dominant operator and new entrants.

Peru

Although the prevalence of basic services in Peru is lower than in the three other Latin American countries we have discussed, the country's telecom market has become as efficiently regulated as any in Latin America. Osiptel [Organismo Superior de Inversión Privada en Telecomunicaciones], which was created in July 1993, has technical, economic, financial, functional, and administrative authority over telecommunication market issues. Among other things, it promotes competition and consumer rights, authorizes sanctions, and fixes and approves rates. Osiptel also administers the Private Telecommunications Investment Fund (FIFTEL), which promotes services in rural areas and services of social interest, such as universal access. The Ministry of Transport and Communications (MTC) administers the general politics of the telecommunications sector, including the electromagnetic spectrum.

interconnection. "Telmex Still Unable to Agree with Competitors on Interconnection Fees for Long Distance Service," *SourceMex*, University of New Mexico, November 11, 1998 (Lexis Nexis document).

⁵⁷ See the Telmex and Alestra websites, www.telmex.com.mx/comp_1.htm and www.alestra.com.mx.

In 1994 Osiptel and the Peruvian privatization entity Promcepri merged and sold the two state-owned carriers (CPT and ENTEL) to Telefónica de España. The new monopoly TdP [Telefónica del Perú] was granted a period of exclusivity until June 27, 1999, when Osiptel must allow competition for basic services. In accordance with its WTO commitments, Peru has guaranteed foreign ownership or control of all telecommunications services and facilities, market access for satellite services and facilities (domestic and international), and procompetitive regulatory principles beginning in 1999. Other basic services are to be liberalized in 1999 for the long distance and international markets and have been liberalized without phase-in for the local market. Peru has also announced that it will adopt a price-cap rate system based on costs and that interconnection charges will be based on long-term incremental costs for unbundled service.⁵⁸

In August 1998, Osiptel hastened the transition to competition when it announced an agreement with TdP to end monopoly status one year early, opening the telecommunications market to full competition effective August 1, 1998. There will be no limit to the number of operators allowed to provide basic services (firms must meet the requirements that have been set, however).⁵⁹ Tele 2000, a cellular provider controlled by BellSouth, and Resetel have begun preparations to offer local service. According to Osiptel, a number of other firms have also expressed interest in entering the Peruvian market. The Peruvian government expects that, by 2003, investments of US\$2.5 billion will have increased competition, raising the number of lines in service from the current 6.8 per 100 inhabitants to 20 per 100 (including wireless lines, which now stand at 2.5 lines per 100) (Craig 1999). Meanwhile, consistent with the trend of high growth throughout Latin America in the competitive market for wireless services, the number of wireless subscribers grew by 150 percent in 1997 (Lapper 1998).

TdP invested US\$2.2 billion in 1996 and US\$1.5 billion in 1997. The number of lines in service increased by 17.9 percent between the beginning of 1997 and June 1998, rising from 5.9 lines to 6.8 lines per 100 inhabitants. Furthermore, lines in service per employee have increased from 228 to 287 (25.9 percent). Digitalization of the network increased only marginally during this period (from 85 percent to 88 percent). However, the number of calls completed rose from 52 percent to 85 percent in 1994 (the weighted average of local and long distance).

III. Challenges for Regulation after the WTO Agreement

The strongest common denominator for policy in our case studies is *the strong desire to accelerate network build-out*, typically through the privatization of transitional

⁵⁸ Because collecting complete information on firms' interconnection costs is almost impossible, Peru will use benchmarking for interconnection charges until 2000, implementing Chile's interconnection policy as the best example in the region (63 percent of the local tolls). See "Modelo Peru para Las Telecomunicaciones," accessible at Osiptel's website (www.osiptel.gob.pe).

⁵⁹ *El Comercio*, August 6, 1998, A1, E8.

monopolies or the immediate introduction of general competition. A corollary to this goal is making sure that a greater part of the country has access to the expanded network. A policy on universal service is therefore essential.

In our view a second policy objective is equally important: *efficient and flexible pricing and supply practices*. It is not enough to have lots of telephone plants. Communications are a vital input to the information economy, whether at the household or business level. As a key component of the fastest growing part of the economy (information technology investment now represents about 10 percent of U.S. GDP), it is essential that the pricing of communications services maximize efficiency in the marketplace.⁶⁰

Providers of communications services must also be responsive to new opportunities and demands for utilizing them in the economy. For example, in the United States competition is responsible for new business practices for installing leased communications lines. For instance, the timely provision of such lines was a critical factor in enabling small businesses to scale up their capacities as needed. Without these lines small businesses would have had to make step financial commitments for communications capacity months before the need for such capacity had been proved. And MCI's innovative billing software permitted such pricing innovations as "calling circle" discounts that stimulated demand in the long distance market.

The WTO agreement also makes a third goal more immediately critical—*efficient embedding of the domestic communications market in the global market*. The organization of the domestic communications market and the global communications market are not separate. As we have argued, the WTO agreement gave competition in the provision and pricing of cross-border services a major boost. Technological innovation in the form of convergent services on the Internet will accelerate these changes.

Our review of experiences with the transition to competition leads us to focus on four policy challenges. The first is the need for faster transitions to competition. The second is the critical role of rate rebalancing, because rebalancing is essential to combining efficient competition with network build-out and universal service. If rate rebalancing succeeds, it is easier to get interconnection policy right, and interconnection policy (the third policy challenge) is indispensable to getting competition right. Finally, the lack of a credible regulatory process makes succeeding that much harder during the transition to a market economy.

Reducing Entry Barriers and Speeding up the Transition to Competition

⁶⁰ There is a huge benefit for efficient resource allocation in the economy if the market disciplines this major flow of new investments. After all, Marxist economies were perfectly capable of investing a lot in an industry (as witnessed by rusting steel plants in Russia). It is efficient allocation of investment resources that is critical.

We have suggested that transitional periods for retaining monopolies may be justifiable. This point is a key one for many of the poorest countries that have not yet embraced competition to any significant degree. But our case studies also underscore a second reality that has been given further impetus by the WTO Agreement—countries are shortening the transition time for monopolies. Most of the benefits of a transition period can be claimed in a relatively short period (around five years). Protection from competition will give the incumbent an incentive to build out and modernize aggressively. Contrary to the claims of incumbents, new entrants cannot claim large enough market shares fast enough to negate the financial benefits of new plants. (No one has shown such a case to be true.) But the prospect of competition will also discipline market behavior and make consumers bargain more aggressively.

One corollary to the need for faster transition is the need to narrow the range of services covered by monopoly franchises. Monopolies on public phone services are in no danger of losing their markets because of a sudden exit of customers to some other technological alternative. The great policy danger in developing countries lies in not putting enough communications alternatives in the economy at cost-based prices quickly.

Monopolies need not interfere with technological innovation, as Internet and wireless services have shown. Internet services are a perfect example of how low-cost capabilities can dramatically extend services for users trying to gear up for the global information economy. Some countries have experienced significant controversies over the operations of Internet service providers, because monopoly operators have also wanted a monopoly on these services or the underlying infrastructure. Yet even in the United States these services do not pose a threat to basic phone services in the next few years. And phone companies there are finding it profitable to compete for the data traffic that they produce.⁶¹ If Internet providers pose no threat to U.S. phone companies, then the notion that they pose a danger to monopolists in developing countries with insufficient infrastructure is surely an odd one.

Similarly new wireless technologies such as local multipoint distribution services (LMDS) or data broadcasting on the spectrum of television stations offer new ways of providing additional data and voice services immediately in local service markets. They are not going to threaten the markets of the existing wire networks.

Another corollary is that countries must welcome foreign investment as part of the effort to induce investment and reduce barriers to entry (Tarjanne 1998). Foreign investors bring with them not only capital but also new business models that can benefit consumers. As the situation in Central Europe has shown, limits on foreign investment

⁶¹ There are controversies in the United States about whether Internet telephone services should have to contribute to universal service funding by paying access charges for using the local phone network. Thus far Internet services have been shielded from such charges, because these services are considered data services. No matter how this controversy plays out, there is no serious worry that Internet providers will cripple local phone companies.

(even those that allow substantial foreign investment) can effectively preclude competitive entry in the market for local communications services.

If transitions proceed faster than expected, countries probably should take a fresh look at the “build, operate, and transfer” model that has been so popular in the last 10 years, especially in Asia. This model presumes that foreign investors will build and operate new network capacity and then transfer it back to the national monopolist at a later date. Its attraction was that it seemed like a fast way of reconciling an ongoing monopoly with the interjection of fresh sources of investment capital and know-how (Ure 1995). The more rapid movement toward full competition that is characteristic of today’s market suggests that the model may be less useful as a policy option in the future.

Rebalancing Rates to Improve Market Efficiency, Network Build-out, and Universal Service

It is almost impossible to exaggerate the demand for more network capacity in transitional and developing economies. Certainly the traditional indicators of unfilled demand, such as waiting lists for phone service, vastly underestimate the actual pent-up demand. These indicators do not capture the large numbers of people who do not bother registering for telephone service and the even larger numbers who utilize capacity fully because of counterproductive pricing. When demand is unfilled, consumers lose.

A particularly keen irony of prevailing practices is that universal service policies tend to affect network build-out, irrespective of the degree of competition. The usual mechanisms for providing universal service can become the enemy of greater economic efficiency and faster build-out. For example, the common practice of keeping local rates below costs to encourage universal service simply discourages investment in building out the local network.⁶² This type of protection for consumers treats the wrong problem and also discourages investment in adequate network infrastructure. There is little evidence that bringing rates for local service into line with costs causes any significant dropping off from the network in any income group. And to the extent that a problem exists, there are far more efficient ways of handling it (box 5.)

Other rate distortions created in the name of equity significantly hinder the efficient provision of communications services and create political disincentives for competition. For example, relying on subsidies from urban to rural areas (a byproduct of geographic price averaging) can mean that poor urban workers subsidize phone services for the country estates of business leaders. Meanwhile, incumbent operators have a powerful political weapon to use against introducing competition: the argument that new entrants are likely to serve only urban areas (thus “skimming the cream” from the

⁶² Using revenues from long distance services to subsidize universal service (as is done in the United States) is also a bad idea because it distorts pricing and economic incentives for network development.

market).⁶³ Keeping local rates artificially low also creates incentives to inflate the prices of domestic and international long distance services (including data services). Inflated prices for these services constitute a significant tax on business. The extremely high cost of international calling is a barrier to small firms interested in export-oriented growth.

All countries suffer from inflated rates for international services, including the United States. But the situation in virtually every developing country is far worse than it is in industrial countries. Rates for international services to and from most developing countries are so high that they are equivalent to a tariff of 100 to 500 percent on communications and data services. These escalated prices act as strong disincentives in the creation of an information-based economy. Advancing the globalization of an economy without cost-based prices for international communications services and the discipline of market competition is almost impossible.

What can be done? The most important step is to move to cost-based rates for all services. Making this change requires significant rate rebalancing across classes of services and much less rate averaging. To facilitate cost-based rates, public policy can duplicate the logic of other digital information markets. These markets cover costs in their pricing but typically feature steadily declining prices to encourage high utilization. As a result prices are driven down, and suppliers are able to maintain adequate margins even at lower prices. Rebalancing means that the cost of local service prices may rise (at least in some regions of a country), but many other prices will decline and tap significant demand elasticity.

The good news about rebalancing is that while certainly it is subject to political controversy, even dramatic needs for rebalancing can be managed without any loss of universal service. The Philippines was especially dependent on revenues from international services from the United States. As those rates declined, the Philippines undertook significant rate rebalancing. (As of 1998, households pay about US\$20 per month for basic local service.) Lower prices for long distance services, along with the belated rapid expansion of cellular services, have also generated more domestic long distance traffic and income (Merrill Lynch 1997; National Telecommunications Commission 1997). More generally, modern financial techniques allow for effective commercial financing to handle many cash-flow issues during rebalancing. When these techniques are not enough, international financial institutions like the World Bank are willing to assist (BragaForestier, and Stern 1999).

Bringing rates in line with costs also requires that rates respond to the economic logic of the service. Cellular telephony is a good example. Israel jumped ahead of the United States in cellular phone use in part because of mistaken U.S. pricing policy in the United States. The United States used a “receiver pays” principle for cellular calls. Israel uses the same principle as in wire network calls, “sender pays”—a mechanism that responds much more accurately to the economic incentives involved in calling someone.

⁶³ A geographically averaged rate, which inflates prices for urban areas, makes entry into urban areas quite profitable.

A second requisite policy measure is greater flexibility for operators in setting prices. Price caps for broader baskets of services are one way of achieving this goal. As competition is introduced it is especially desirable to allow more flexibility in pricing plans for local services. For example, regulators could allow more pricing options featuring variable rates (so-called “metered calling”), allowing operators to meet changing market and cost conditions.

A third policy choice involves controversies over the pricing of new services made possible by technological innovation. Regulators can find themselves mired in arguments about the cost of special services such as Internet video-conferencing. There is no perfect solution to such issues, but we think the notion of creating a “safe harbor” for the prices new services has much to recommend it. As long as existing communications markets are imperfectly competitive and have badly flawed pricing, exempting new services and technologies from the regulatory errors of the past may be the best policies. These services have great potential for inducing dynamic corrections of past errors by forcing cost improvements and pricing reforms in traditional services. If the new services someday grow to become a major part of the national market—say 5 percent of the total market—the regulator can reconsider the policy and align it with policies for traditional services.

Box 5: Policies that Promote Universal Service

1. ***Define the goals of universal service carefully over time.*** Services for villages may be the right proxy for universal service in rural areas initially. And while getting phone services to villages is the preeminent need, introducing new forms of universal service such as Internet access remains an important challenge. Industrial countries use social institutions (schools, hospitals, and libraries) to provide communities with Internet access. This practice defines the delivery mechanism (and cost implications) of such measures more tightly than putting Internet access on the same level as phone service.
2. ***If there is a transitional monopoly, allow exceptions for encouraging universal service.*** The experience of the CEECs suggests that even with performance goals, relying solely on modernizing monopolies to build out to rural areas is a mistake. In Poland rural cooperatives have become an important source of network build-out. These cooperatives operate under the equivalent of a “build, operate, and transfer” agreement, that ultimately returns control to the monopolist but provides for compensation.
3. ***Consider “franchising” through the monopolist.*** This option is, in effect, what it is being done with wireless services when local entrepreneurs buy and operate wireless phones for a village. An example of how alternative arrangements for network expansion can help rural areas is microlending in Bangladesh for cellular telecommunications and Internet services that are organized by woman entrepreneurs in villages.*
4. ***If dominant carriers are receiving subsidies to provide universal service, do not overpay, and consider the consequences for competition.*** The universal service subsidy benefits the company, not just those with low incomes. For example, the United Kingdom studied the net cost for British Telecom of providing universal service in Britain. The regulator concluded that the net cost to British Telecom would be tiny, for two reasons. First, the economically efficient cost of the subsidy was not that large. Second, British telecom would gain a significant competitive benefit through brand identification and network coverage as the one supplier available to everyone.
5. ***Better yet, do not give a single carrier subsidies to provide universal service.*** Competition will ensure that funds for subsidies are used more effectively. Chile is the pioneer in this area. Chile makes phone companies bid for universal service funds and thereby creates an incentive to get the most service for its monies. This method also helps assure that the funding is competitively neutral in its impact.
6. ***Best yet, fund consumers, not carriers.*** The problem of providing universal service, once a network is built, is income related. Households can make their own decisions about spending priorities. Vouchers for telephone services—whether they are used for prepaid calling cards or home phone service—allow for greater consumer choice. And they eliminate the distortion from pricing local services below cost to make them affordable.
7. ***Create transparent sources of funding for universal service that draw on more efficient taxing principles.*** A value-added tax (VAT) or general treasury revenues are efficient sources of funding for universal service.**

*Yunus, Muhammad, with Alan Jolis. 1998. *Banker to the Poor*. London: Aurum Press.

** Noam, Eli. 1995. “Beyond Telecommunications Liberalization: Past Performance, Present Hype and Future Direction.” In William J. Drake, ed., *The New Information Infrastructure—Strategies for U.S. Policy*. New York: The Twentieth Century Fund.

Getting Interconnection Policy Right

Interconnection policy is extremely difficult to implement, because it produces high levels of uncertainty and strife. Given the economic significance of the issue, this outcome should surprise no one. But there is in fact a policy consensus based on hard-won lessons from introducing competition.

The Interconnection Consensus

Requirements for interconnection go to the heart of competition, so vigorous disputes over its precise terms are to be expected. These regulatory and judicial disputes (especially in the United States) have created the impression in developing countries that there is no consensus on the correct principles and terms for the policy. But in fact a fundamental consensus exists in industrial countries. Interconnection policy sets pricing for interconnection based on some version of long-run incremental costs. It requires the timely provision of leased circuit capacity, significant unbundling of the network elements available for interconnection, nondiscriminatory access to rights of way, and portability for telephone numbers when subscribers decide to switch carriers. And this policy uses a process featuring direct negotiations among commercial parties and a timely dispute resolution mechanism that allows the regulator, relying on existing guidelines (such as the reference interconnection offer required in the EU) to settle matters that cannot be resolved during the commercial negotiations (European Commission 1998).

Disputes over interconnection pricing in industrial countries, for example, may focus on whether the basic form of interconnection between two local networks should cost \$0.01 or \$0.03 per call. However, the fury generated by these disputes has created the mistaken impression in many developing countries that estimates of costs in industrial countries vary wildly. (See box 6 for more information on these rates across countries.) Similarly, disputes arise over the precise range of elements of the network's functions that must be unbundled and available to new entrants, even though a consensus exists that several elements do in fact require unbundling.

A telling example of the policy debate involves the recent revisions of interconnection charges in the Philippines and Mexico. Both countries were leaders in introducing competition in telecommunications services. Both have independent regulatory commissions and dominant carriers that have had significant build-out programs in the decade. Both still have a long way to go in achieving teledensity levels comparable to those of the leaders among industrializing countries. Both rely heavily on revenues earned from terminating incoming traffic from the United States to compensate the dominant carrier for local services. Yet in terms of pricing interconnection, the two countries could not be further apart. The 1998 reforms in the Philippines lowered interconnection charges from about US\$0.28 per minute to US\$0.19 cents. The reforms in Mexico announced in December 1998 lowered the charges to US\$0.027 per minute. In the Philippines the high costs of local calls means that new entrants building out network

infrastructure and stimulating growth in the domestic market may stumble. Mexico's lower per-minute cost means that the prospects for major new investment are good.

Box 6: Interconnection Pricing

In December 1998 the U.S. Federal Communications Commission (FCC) issued a report on international markets that summarized interconnection pricing for long distance traffic in various regions of the world. While not fully comprehensive (and despite differences in requirements for and ways of measuring interconnection), the survey provides an accurate reflection of practices in most countries. Rates for interconnection of local phone services, and especially for unbundled network elements (for example, transport without switching), are much lower. Rates as of May 1998 are listed below.

European Union

Rates are based on "double-transit" interconnection, with the "major supplier" providing termination any place in the country at this rate. Rates are in U.S. cents per minute of switched service.

Austria	2.8
Belgium	3.5
Denmark	2.6
Finland	3.3
France	3.0 (1997 rate)
Germany	3.0
Ireland	6.1
Italy	5.1
Luxembourg	2.3
Netherlands	2.4
Portugal	21.3
Spain	5.0
Sweden	2.8
U.K.	2.0

Asia Pacific

These rates are for domestic termination anywhere in the country of incoming calls from other countries after these calls arrive at the switch in Tokyo and do not include delivered calls under the settlement rate system. The rates are for peak hours only (not discounted off-peak periods). All rates are in U.S. cents.

Australia (August 1997)	2.0
New Zealand (November 1996)	2.0

Japan (March 1998)	1.7
Hong Kong (September 1998)	4.5 (proposed rate)
<i>Latin America</i>	
Rates are for interconnection by the major supplier to terminate the long distance calls originated by competitors. All rates are in U.S. cents per minute.	
Mexico (1998)	2.3 (additional surcharges may be applied)
Chile (1998)	6.0 (price cap—actual charges may be lower)
Peru (1998)	2.8 (benchmark used by regulator if in cases of arbitration)
<i>Source:</i> Federal Communications Commission (International Bureau), "Report on International Telecommunications Markets, 1997–1998." Prepared for Senator Ernest F. Hollings, Committee on Commerce, Science and Transportation, United States Senate, December 7, 1998.	

The Mexican rates are consistent with the rates Argentina has announced and that Chile already has. Advocates of the Philippine rate point to the attacks on U.S. interconnection pricing by the Bell Operating Companies. But these critics ignore the fact that in recent years the cost of interconnection has been only a few cents per minute. One new entrant complaining about the Philippines has Bell Atlantic as a major investor.

Determining the costs of incumbents reliably is difficult, especially if we pay some attention to historic costs. The necessary data are simply missing. But there is no reason not to use some form of international benchmarking to help determine interconnection costs. A big enough pool of countries now exists to provide an appropriate reference group. Even allowing for some upward adjustments based on uncertainties about local conditions, a country would get a more realistic calculus for costs in a much faster period with benchmarking than with other methods. Benchmarking would certainly be more reliable than the somewhat quixotic search for accurate embedded costs.

Interconnection and the Resale Debate

Executing a successful interconnection policy is often difficult, because many countries are chasing the goal of "real network investment." Many governments fear that new competitors will simply lease transmission and switching capacity from the incumbent carrier and resell telecom services at a discount. With no investment costs, these operators will then pocket the profits of buying services at bulk discount rates and passing only part of the discount on to their customers. The result, governments fear, will be that incumbents will invest less in telecommunications infrastructure and that new entrants will not invest in it at all. To prevent this situation, some governments (Mexico, for example) give somewhat better interconnection terms to carriers with significant network facilities.

A related concern is that unlimited entry in new network development will create surplus network capacity. In theory this situation means less investment, because no one makes money if surplus capacity exists. Or governments in countries where there is plenty of network investment may fear the negative consequences for business if new entrants fail. Korea's limitation on the number of licensed international telephone carriers (three in all) seems driven by this fear. Several other Asian countries have similar policies.

We have observed that special national features such as demography and existing levels of network development can influence the timing and terms of a transition to competition. But network economics and technology are fundamentally the same everywhere. The experiences of the United Kingdom and the United States suggest that the fears of resale and surplus network capacity are often overblown—as long as countries make realistic plans for the transition to full competition.

The **United Kingdom** initially limited the number of network competitors but later decided that this policy had failed, even though a duopoly in long distance services had emerged. The policy had not maximized new network build-out and had not lowered prices as rapidly as expected. The government then switched to allowing unlimited entry but gave some regulatory advantages to carriers owning or willing to build their own facilities-based networks. In the context of the history of U.K. network development, this policy was a gamble. It assumed that hybrid systems for cable television and telephone services could provide competition in local exchange services.

But the U.K. government was careful to limit the advantage it had given to facilities-based networks. By the late 1990s the biggest disadvantages for resale carriers involved two elements of what is generally called “equal access.” First, the government did not grant these carriers rights to “dialing parity”—that is, their customers had to dial extra digits to access their services. Second, the government did not grant “carrier preselection” for resale carriers, so their customers could not choose a resale carrier as an automatic option when they made a call.⁶⁴

The British regulator reasoned that these advantages provided some added incentive for network investment but did not discourage resale operators from competing vigorously wherever facilities carriers lagged on pricing or customized services. This consideration is a key one for regulators in developing countries where pricing distortions are one of the worst problems in the marketplace.

⁶⁴ U.K. policy also selectively favors facilities networks providing local exchange services over those specializing in primarily in long distance services. The primary disadvantage of long distance networks is the failure of the United Kingdom to unbundle the network elements of the local loop. For example, the long distance carriers cannot easily co-locate DSL equipment (designed to upgrade some lines to highspeed service) at the British Telecom switch. Given the United Kingdom's strict price cap on private line access to the local loop for competitors, both long distance facilities networks and resellers have been able to compete without unbundling. Both equal access and unbundling will be introduced in the United Kingdom as a result of policies of the European Union.

The **United Kingdom** had different priorities for network development than those many regulators in the developing world face. The U.K. government rightly assumed that competition in the long distance market would be fairly easy to implement, so its goal was to move up the next level—second wires to homes and broadband connectivity. The priorities in developing countries are to establish competition in long distance services and to use competition in local services to raise teledensity levels. In many ways a policy supporting a mix of equal access, unbundling, and resale may allow for greater technological and market flexibility. The **United Kingdom**'s enthusiasm for cable telephony never contemplated the measures many dominant phone companies advocate in Europe today. These incumbents argue that new entrants must put switches into virtually every significant traffic point in their country or be denied favorable terms for interconnection. The only justification for this strategy is to protect the incumbent and one or two privileged new entrants.

The history of the United States is a strong argument for both unlimited entry and equal regulatory treatment for resale carriers. The U.S. experience shows that it is very hard to define the difference between facilities-based and resale carriers, as most resale carriers have some telephone switches. All facilities-based carriers also resell the capacity of other carriers. And most importantly, until recently most new entrants in the market began primarily as resale carriers. Resale allowed the new entrants to build a customer base and cash flow. Successful resale carriers soon began to invest in facilities and eventually developed into facilities-based networks. On balance, if a carrier could build up its customer usage rates, it was cheaper to own facilities on key routes, creating a natural market incentive for large resale operators to build facilities. The United States needed no regulatory measures favoring facilities-based carriers to get new network investment.

Regardless of the U.S. experience, the political attraction of a tilt toward facilities-based operators is considerable. Facilities represent visible building and investment—always good things politically.⁶⁵ While in the long term a sound policy will give equal standing to facilities and resellers, in the short term facilities-based operators may win out. In this situation the regulator must guard against any policy that discriminates against easy entry and interconnection in the name of encouraging facilities-based operators.

⁶⁵ While in the United States every government policy gets translated into “jobs” for the economy in order to give some immediacy to its impact, many developing countries emphasize the gains to investment and construction from reform. Resale may lower prices, improve network utilization, and even stimulate creative product offerings. But these benefits are far less politically compelling than laying in new fiberoptic cables. Another liability for resale is the fear that it could spoil the profitability of international services. The immense margins on international services are the dirty secret of the telecommunications world. Even in the United States they are very large indeed. Resale is a strategy well-suited to quickly winning over those customers who make the most international calls. The resellers can still make ample margins after very large discounts to key customers. Losing these customers might not do serious damage to the total market share of the incumbent carrier, but it can take a real chunk out of profitability. Operators investing heavily in network facilities, in contrast, may exercise more pricing restraint than resale carriers, simply because they are more inclined to live cozily under the price umbrella of the dominant carrier while they try to improve cash flows.

Requiring new operators to have many switches and points of network presence in order to qualify for favorable interconnection terms can defeat both resale and facilities-based entry.

This caution is especially urgent because technology is creating many opportunities for new services that do not fit neatly into the facilities-based versus resale distinction. One of the most important developments in the U.S. and European markets is the “backbone” long distance network operated by companies that are only in the wholesale business (see box 2). These companies have made huge new investments in transmission capacity, hastened the introduction of packet-switched networks (which are far more efficient than the traditional networks of companies like AT&T), and lowered the prices of services. Of course the rise of these wholesale “carriers’ carriers” means that other carriers are reselling the services from those facilities. It is precisely this kind of innovation that interconnection policy should not penalize.

Creating a Credible Regulatory Process

No discussion of the credibility of regulation can ignore the legacy of government ownership of the dominant carrier that once prevailed in most countries. When the government holds a significant financial stake in the phone company, it creates mixed incentives. For example, one major European country was planning to put the Minister of Communications on the board of directors of its largest phone company to represent the government’s significant ownership position. The United States quietly protested that this move would create a huge conflict for the minister when he was exercising his regulatory responsibilities, and he subsequently decided not to serve on the board.

Korea is an instructive example for developing countries. Korea launched competition in long distance services in 1996, retaining substantial (72 percent) government ownership of the former monopolist, Korea Telecom. And as in many countries, partial privatization did not address the issue of whether Korea Telecom had a special status in government policy. (Foreign ownership in the company cannot legally exceed 33 percent of its equity.) Even after the liberalization of foreign investment rules in 2000, Korean commitments at the WTO stipulate that foreign investors will be limited to 49 percent ownership in other Korean telecommunications carriers (Kim, Ohn, and Kyong 1998).

Until October 1997 Korea Telecom was a “government investment company.” As such, it was obligated to emphasize public objectives even if they interfered with commercial goals. The government had the right to approve the budget, select senior management, and decide key policies. Even though the company has now been converted into a commercial enterprise and legal entity, experts still raise questions about whether it has full freedom to choose its senior management. This continuing involvement in the affairs of the dominant operator is not unique to developing countries. In the fall of 1998, the Communications Minister of Italy expressed displeasure when Telecom Italia made a

major management change without his prior approval, although the company is a commercial enterprise.

While continuing government ownership complicates relationships between companies and regulators, it can also yield some benefits. In developing and transitional economies, privatization represents more than just a way of improving the internal efficiency of firms. It is also an important commitment device the government can use to reinforce its promise not to interfere with the management of privatized enterprises (Ordover, Pittman, and Clyde 1994). Regulatory credibility is significantly enhanced if privatization is phased in, for instance. Regulatory takings at the early stages of privatization can significantly reduce revenues at the later stages. The risk of losing future privatization revenues serves as a credible restraint on regulatory arbitrariness.

Managing the relationship between former government operators and regulators is a major challenge, because privatization rarely takes place immediately. An even bigger task is finding the right formula for ending a monopoly—particularly when the initial policy choice proves inadequate. The pace for moving to general competition is speeding up considerably. Decisions on extending monopoly franchises made earlier this decade now look dubious. But reversing these decisions raises the credibility problems we discussed early in the paper.

The Czech Republic addressed precisely this kind of “regulatory regret” by using a buy-out to end a monopoly early. Singapore and Hong Kong, China, also chose this approach when monopolies on the international voice services of Singapore Telecom and Hong Kong Telecom became serious sticking points in the WTO negotiations. (The OECD countries found no economic justification for these monopolies in such advanced economies.) Both governments had extended their monopolies during the last decade. Both were listed on public stock exchanges, although the Singapore government had majority control of its carrier.

Both governments pointed out that they had built their credibility in world markets by sticking to their contracts. Even if they privately agreed that the monopolies should end, they argued, they could not easily undo the situation. In the closing months of the WTO negotiations Singapore found an answer. It paid a very large sum of money (in the neighborhood of US\$1 billion dollars) to end Singapore Telecom’s monopoly on both domestic and international telecommunications services. Of course, the government owned most of the carrier’s stock.

After the WTO agreement Hong Kong followed a variant on this path. The approach in Hong Kong included using regulatory power to introduce international simple resale on all routes except the one to China. This measure effectively allowed competitors to Hong Kong Telecommunications International to rent capacity on the company’s international facilities and provide inexpensive international service. Hong Kong Telecom was also permitted to increase local phone rates significantly through the year 2000 and to set flexible prices to meet competitive challenges. (Hong Kong already

had competition in local phone and mobile services.) As a result, Hong Kong Telecom voluntarily agreed to end its monopoly on international telephone and fax services by 2000 instead of 2006 (as originally scheduled). Because the Singapore and Hong Kong solutions involved a voluntary commercial agreement and compensation, advocates of consistency in commitments and advocates of market competition were both satisfied.

The question facing many countries is what to do in similar circumstances. These examples are certainly instructive. A change in the concession cannot be arbitrary and capricious. The buyout is an attractive solution, but governments also have other ways of altering the costs and benefits of the concession holder.

Some countries are taking as narrow a reading of monopoly concessions as they can. In effect, they are taking advantage of new technology delivery systems and new services to open the market. Mobile and satellite services are two examples of new technology delivery systems that are being used to define new categories of services outside the monopoly. Jamaica, for example, is allowing new licensees to build and operate satellite earth stations to serve private networks. Even before ending its monopoly on public telephone services, Brazil relaxed its definition of what constituted a “private network” to permit a company to open its private corporate network to exchanges with all major suppliers and distributors. The Internet, including voice and video over the Internet, is another major opportunity. The key point here is that changing the definition of monopoly can induce the incumbent to voluntarily renegotiate the monopoly license. Some financial compensation may be necessary, but other offsets can include changes in pricing or “dominant carrier” regulation that improve the competitive prospects of the former monopolist.

Establishing an Effective Regulatory Authority

One of the hardest tasks of the transition to a competitive market is creating an effective independent regulator with adequate expertise, information, authority, and accountability. The problem grows worse as technology creates a greater convergence of services and erodes the logic of traditional regulatory distinctions. The crucial first step is simply to separate the regulator from the operator and then provide the regulator with adequate resources (see box 4). A top priority is to “work smart,” not just hard, by using tactics that simplify the task of regulation. Three of these tactics are especially appealing.

First, the regulator should select its market policy to provide incentives for the timely disclosure of critical information. Competition and privatization are, in a very profound way, measures to induce better disclosure of information, because now the financial markets and other suppliers are monitoring the claims of the dominant supplier. While competition is no bar to self-serving complaints by new entrants, it does create a marketplace of information about the telecommunications market. For example, one reason for introducing more competition in wireless services and allowing greater bandwidth for many licenses is to let market competition sort out the complex issue of what constitutes the best use of spectrum.

Monopoly is the enemy of good information. If a country opts for a transitional monopoly it would do well to borrow from the examples of Argentina and Hungary. Both countries resisted granting a single national monopoly. Creating regional monopolies allowed government officials to benchmark the performance of the monopolists against one another. This device is highly imperfect device, as the limits on monitoring state telephone monopolies in the United States demonstrated. But it is better than dealing with a monolith.

Second, regulators can ease their burden by finding ways to use private property rights to simplify their jobs. As we have argued, regulators should consider how to use private dispute resolution mechanisms, especially during the early years of establishing credible regulation. Having the regulator publish reference offers for interconnection that can then be negotiated privately is one way of using these mechanism. (The negotiations must have a deadline; otherwise the regulator settles the dispute.)

Spectrum policy is an especially demanding challenge for regulators. Taking several preliminary steps can ease the regulatory burden, however. First, regulators can make sure that property rights for the spectrum are and well defined. Second, they can allow licensees greater discretion in determining how to use the spectrum once the regulator has implemented procompetitive licensing.⁶⁶ (The Mexican experience shows that auctions can yield a large number of new entrants quickly and in a way that builds confidence in the regulatory process.) The marketplace can then determine the spectrum's value.

Third, regulators can use international arrangements (such as the WTO's regulatory principles) to simplify national policy. Regular consultations among national regulators, much like those among central bankers, will allow regulators to share best practices and experiences (Tarjanne 1998).

The growth of arrangements that "recognize" certain symbols of quality in telecommunications equipment is an excellent example of how globalization can simplify regulation. In one such innovative arrangement, mobile handsets offered by suppliers such as Iridium, Globalstar, and ICO now bear the ITU symbol, simplifying issues of equipment testing and certification. Across the Atlantic (through an agreement between the United States and the EU), the Pacific (through an agreement within the Asia-Pacific Economic Cooperation Agreement, or APEC) and across North America (through the North American Free Trade Agreement), testing and certifying telecommunications and computing equipment is becoming less complicated.

All of the techniques for improving regulation do not resolve the fundamental question of how to organize regulatory power. The problem of dividing up responsibilities among different government agencies is particularly difficult. Scholars

⁶⁶ Of course, national spectrum allocations would still comply with ITU obligations (Maria Lourdes KasilagSmith, M or P? 1997).

have long known that governments have different ways of delegating power to regulators (Noll and Rosenbluth, 1995). No matter how a government chooses to delegate regulatory power, however, it must be clear about the trade-offs.

The U.K. model has proven popular because it reflects some of the incentives of parliamentary governance that put a premium on ministerial responsibility. The ministry formulates the parameters of regulatory policy (such as the conditions for acquiring permits, the number of permits to be assigned, and the sequencing) and may even issue individual licenses. Such a division of responsibility can work effectively, as it does in the United Kingdom. But it also tends to strip regulators of much of their power. Granting licenses and putting conditions on them become acts that undercut the authority of the regulatory commission and can cause dissension between the ministry and regulatory body. Worse yet, many countries do not grant regulators effective enforcement powers. If regulators do not control the licensing authority, they manage the behavior of the dominant phone company. This problem has challenged policymakers in Mexico and may cause problems for some of the new regulatory authorities in Europe.

In contrast, the division of powers between the President and Congress of the United States circumvents many of these problems. In the U.S. model Congress creates an independent regulatory commission and delegates powers to it. The broad authority granted to the FCC is intended to reap the benefits of expert policymaking in a highly technical market. The FCC has considerable discretion, operating under a Congressional mandate to consider the public interest in developing and executing its policies.

When Congress delegates power, it also creates elaborate safeguards. The public interest requirement is subject to extensive judicial review. Elaborate administrative procedures assure that the FCC's policymaking is transparent. The result is a process that emphasizes sometimes overly elaborate rules rather than ad hoc problem solving to shape policy. The FCC is never free to invent major policy on the spot. For observers from Parliamentary systems, this "check" can be frustrating. But the FCC has one major advantage over regulatory bodies in the rest of the world: it has the power to make decisions. It controls rates, licenses, and universal service policies.⁶⁷ Its broad control over wire, wireless, and broadcast networks also gives it a strong hand when dealing with convergence issues.

Whether a country chooses to follow what we have called the U.K. or the U.S. model, transparency remains a key issue. Because telecommunications requires detailed regulatory supervision, regulatory discretion must never compromise transparency.

⁶⁷ The FCC's authority is tempered by the strong roles of Congress and the courts and by federalism. State regulatory commissions are important to local telecommunications regulation. In addition, the Departments of Commerce and State have prominent roles in creating legislative policy and managing the government's use of the spectrum, and in issues involving other countries.

Notes for the Future

The telecommunications industry is undergoing a revolution. Happily, it is a benign revolution. Technological change and competition are making possible changes that were considered improbable even 15 years ago. According to Luis Jimenez of Arthur D. Little, "It used to take countries 20 to 30 years to increase penetration rates from 10 to 30 lines per 100 inhabitants. In many countries now it is taking a decade or under" (Lapper 1998). We believe that a quick transition to competition under procompetitive rules can yield even greater benefits in the future.

The WTO Agreement on Basic Telecommunications Services created a new regime for the world market. The basics of the regime require that we pay close attention to regulatory fundamentals. These include low barriers to entry in the market for communications services, effective rebalancing of rates for services during the market transition, strong interconnection policies, and the creation of independent regulatory authorities with the resources and power necessary to foster competition and safeguard consumer welfare.

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