

## **The Evolution of Global Networks: The Precarious Balance Between Governments and Markets**

Jonathan D. Aronson

This chapter focuses on the issues raised by the emergence and integration of international networks and on the attempts by governments to guide and regulate the development of these networks. My analysis resides in the shadowy regions where local, national, and global policies overlap and where market forces and government regulation tug against one another. I propose that even as attention migrates to global and local levels, governments will inevitably continue to matter. Although they will need to coordinate their actions on some issues, they will not (and indeed should not) go away. But their roles should and will change. For global networks to prosper and for the benefits of these networks to be distributed equitably, governments need to act judiciously using appropriate policy instruments to encourage market forces to continue to transform the communications terrain. They must seek and find the precarious balance between government control and free market competition.

### **1. Introduction**

To a political economist like myself, what is most striking about the thinking, musings, and writings about the political economy of global networks is how little thoughtful, comprehensive work has appeared. There exists some fascinating and important work on the political economy of standard setting, on the difficulties of integrating conflicting engineering and marketing cultures, and on the politics of telecommunications regulation and liberalization. But mostly what is widely available are rosy, often uncritical, pictures of the new possibilities that the wonderful world of multimedia technology will soon make available to every consumer at reasonable prices.<sup>1</sup> Or, for readers drawn to tales of corporate leadership or skulduggery we have available writings by the likes of Ken Auletta and William Shawcross. Shawcross's recent study of Rupert Murdoch's empire-building efforts is representative.<sup>2</sup> Readers are informed that Murdoch has built the mightiest media empire ever to span the globe and are immersed in the details of the rise, fall, and recovery of Murdoch's fortunes. Yet Murdoch's supposed power in this breathless account is derived almost entirely from the additive weight and expanse of media properties, not from their synergy. There is no analysis of how the breadth, diversity, and scale of Murdoch's properties might allow him to create something larger than the sum of its parts. The empire in short, is treated as international but not global. Global networks are not part of the story.

This is not really surprising. The language and syntax needed to conceptualize truly global developments are lacking. The ability to think in terms of global systems is rare indeed.

Gregory Bateson, a great anthropologist as well as one of Margaret Mead's husbands, once was asked what single quality was most needed by students and practitioners working in the field of development. He responded, "Courage." He elaborated by explaining that the problem was so gigantic, complex, and depressing that it was almost impossible for anyone to get his or her mind around it. Instead, people focused, understandably, on some small piece of the problem--water rights in Bali, urbanization in West Africa, communications modernization in India, and so on. Only a few rare individuals could manage to deal with the larger picture without becoming hopelessly fuzzy and general in their thoughts and prescriptions.<sup>3</sup>

Thus, it has been well publicized at least since Paul Ehrlich's *The Population Bomb* twenty-five years ago that the Malthusian problem was back -- global population was increasing at geometric levels.<sup>4</sup> The earth can support 5.5 billion people for a while but at what level of energy consumption and comfort? For how many decades can we add a billion people a year?<sup>5</sup> Sadly, at the same time the gap between the rich countries and the poor countries is widening. In its most recent *World Development Report*, the World Bank calculated the income of the poorest and richest 20 percent of the population of the globe grouped by poor and rich countries. They found that in 1960 the poor earned 2.3 percent of global income and the rich 70.2 percent of global income. The figures for 1970 were 2.3 percent and 73.9 percent. For 1980 they were 1.7 percent and 76.3 percent. In 1989, the latest year for which figures are available, the 20 percent of the population in the poorest countries reaped only 1.4 percent of global income while the richest 20 percent garnered 82.7 percent of global income. In other words, in twenty-nine years the ratio of rich to poor increased from 30 to 1 to 59 to 1.<sup>6</sup> Obviously, despite all the talk about population control and development, the world as a whole has been unable to attack these problems systematically and is failing to curb population growth and poverty. These stark figures are the background factors that underlie massive governmental instability and population movements in all parts of the globe.

On a parallel track, detached from any consideration of population growth, environmental degradation, or development, countries and firms are moving rapidly toward global networks. Engineers and companies are groping eagerly toward a bigger, brighter future.<sup>7</sup> Some even express hope that these new network communications possibilities will substitute for some commuting in tomorrow's workplace and that teleconferencing may minimize the need for long distance travel. The merging of communications and computer technologies appears to be yielding benefits. Undoubtedly, it will take longer to factor entertainment (read: content) into the equation than the promoters of multimedia magic predict, but that too will happen.<sup>8</sup> The boundaries separating televisions, computers, telephones, newspapers/magazines, and satellites, cable, and microwave will all erode and evaporate, but they will do so in ways nobody can yet predict confidently.

Among large firms, globalization of production is now an accepted goal. If a large or even a medium-size firm cannot produce globally on its own, then new strategic alliances need to be forged. To be competitive, firms or groups of firms have decided that they must think regionally or globally to have any chance of succeeding. National comparative advantage has been replaced in many cases by regional and global advantage.<sup>9</sup> To function efficiently, firms involved in global production increasingly demand integrated, global communications over global networks.

Manufacturing and service firms are struggling to figure out what it means to be global and how to get there. To achieve these goals, particularly in the wake of the sobering and

largely unexpected decline of IBM and new questions even about Apple's prospects, companies are making their bets on the future as strange bedfellows make peace and form alliances. In 1993 alone, for example, we witnessed startling announcements of collaborations and mergers that would not have been believable a few years ago. What does it really mean when AT&T hooks up with McCaw, MCI, and British Telecom (BT) combine some efforts, Time Warner goes shopping, Paramount is put into play, and Bell Atlantic and TCI announce their intention to undertake the largest merger in corporate history (it was not immediately clear who was really swallowing who)?

Almost every major firm is betting that communications will be key to its future. They do not want to be left behind. As a result, they are quite literally betting their companies that their vision of the multimedia future -- or one close enough to it that they can adapt to it later -- will come to pass. Who will be the winners? Nobody I know who follows these issues closely is bold enough to predict the eventual winners. I suspect that they secretly believe that the networks, the phone companies, and other established ventures could, despite their size and visibility, be bested by the next Bill Gates (who, as yet undiscovered, is quietly puttering away on her new breakthrough company).

## **2. Issues Raised by Global Networks**

This same absence of global thinking also plagues those considering the consequences of emerging global networks. (In this chapter I focus much more on the regulatory consequences of the globalization of national networks than on the implications of their modernization.) Yet, atop these macrodevelopments lurk important issues raised by rapid improvements in communications technology, the emergence of interconnected global networks, and falling prices for international communications. To illustrate, the following paragraphs describe seven important developments in seven separate spheres with brief comments about the policy issues they raise. This litany does not solve policy problems, but it at least demonstrates the complexity of new issues facing firms and governments as a result of the integration of global communications networks.

### **2.1. Competitiveness and Productivity: Growth and Jobs**

It is now common to note that communications networks and infrastructure are as important to growth and competitiveness in the world information economy as transportation infrastructure was during the heyday of the industrial economy. For firms to compete nationally and globally, they must at a minimum be plugged into an efficient, affordable communications network. For countries to compete, they need to be plugged into the global communications infrastructure. Debates over the direction of the Clinton administration's efforts to build a new digital information highway are built around this view of the world. In addition, there is fierce argument about whether the best way for countries to progress rapidly today is to use modern communications to ignite "leapfrog development."

### **2.2. Finance: The Globalization of Money**

The recent globalization and growing interdependence of capital markets and financial instruments followed from the internationalization of the Japanese yen during the 1980s and the introduction of new financial technology related to the revolution in communications.<sup>10</sup> In

the mid-1980s, a "greenbelt" emerged that now ties together the principal financial centers of the world -- London, New York, Los Angeles, and Tokyo. Within this greenbelt, a twenty-four-hour-per-day, three-hundred-sixty-five-day-per-year financial market operates with great freedom in financial transactions. It is not a coincidence that the United States, the United Kingdom, and Japan, the three countries that host the key financial centers, were at the forefront of regulatory changes that allowed more competition in the provision of telecommunications and information services. The band continues to widen.

Today, the volume of foreign exchange transactions exceeds the turnover in global trade by something on the order of fifty to one.<sup>11</sup> Every foreign exchange and commodity trader and every stockbroker is tied into a global communications network that provides information in real time and is transforming global finance. Thirty-five years ago when the Eurocurrency market amounted to a few billion dollars, central bankers could control it with a few well-placed phone calls. At present, the amount of funds shifting from instrument to instrument and currency to currency far outstrips the money in government hands or governments' ability to influence it. Nobody is surprised any longer when a George Soros bets against the British government and personally makes \$1 billion in a month.

### **2.3. Security: Terrorism, Turmoil, and Crises**

Global networks and global television have focused the public eye for somewhat more than the usual fifteen minutes on the international terrorist bombing or the crisis of the week. The Internet was the communications instrument of choice inside Russia during Yeltsin's siege of Parliament. CNN and fax contacts keep the world up to date on uprisings, revolutions, civil wars, terrorism, and violence everywhere and skew the results in sometimes unexpected ways. Thus, it often is averred that CNN's pictures of starvation forced the United States to intervene in Somalia and that their pictures of dead American soldiers hastened the U.S. withdrawal.

### **2.4. Politics: Diplomacy and Intelligence**

Even the normal functioning of diplomacy is driven by communications networks. About 20 percent of the U.S. State Department's budget, for example, is spent on communications. Each morning, every foreign policy official is greeted by a pile of cables. One result of this has been the death of the plenipotentiary ambassador because it is now so simple for posts to consult with their foreign ministry and for the politicians at the center to instruct their embassies.<sup>12</sup> Intelligence operations are also being disrupted. For example, U.S. intelligence officials opposed U.S. West's efforts to install optic fiber in Russia because it would have all but eliminated their ability to intercept the data flowing over the fiber.

### **2.5. Education: Literacy, Schools, and Training**

Elementary and secondary education appear to be collapsing in the United States. Recent figures suggest that a far higher percentage of the American adult population, perhaps as much as 40 percent, is functionally illiterate. Can the new communications system turn this around? The Whittle initiative in pay-per-view education is one effort to do so. Might it be possible to develop a partnership between computer manufacturers, software developers, the schools, business, and the military to put a computer on every desk in America in a decade? Such a plan has been discussed. In one grand gesture, business and the military would pay to revamp education, improve the literacy levels and technical abilities of their new hires, have facilities

for retraining present workers, and get an industrial policy to boot. Higher education also may be transformed. My own university, the University of Southern California, and the University of Pennsylvania recently received exceptionally generous gifts from Walter Annenberg. These grants should, if we are up to the task, help us reinvent what it means to go to college in the twenty-first century and not simply pay for more scholarships, fellowships, and conferences.

### **2.6. Social Policy: The Breakdown of the Melting Pot**

Long ago, Oscar Handlin described the United States as a melting pot where emigrants from all countries came, were stirred in a giant American cauldron, and were transformed within a couple of generations into Americans. Today, there is more racial and ethnic tension, but there is also more group solidarity. CNN and other media outlets together with cheap international telephone calls make it simple for immigrants to stay in touch with developments in their homelands and with their families and communities abroad and dramatically slows their assimilation into the new culture.

### **2.7. Fairness: The Creation of Techno Nomads**

In 1992, Jacques Attali, former head of the European Bank for Reconstruction and Development, suggested that new global networks will create a class of sophisticated techno nomads able to "phone home" and conduct their business from any point in the globe. More ominously he warned that the great mass of humanity will not have access to these luxuries and may find their prospects growing even dimmer.<sup>13</sup>

## **3. Assumptions and Approach**

In general it is difficult for large organizations in the public or private sectors to dramatically change their trajectory in the absence of crisis or collapse. It is remarkable, for example, how the corporate cultures instilled in firms by their charismatic founders linger long after the creators have departed the scene. Similarly, all the experiments with national competition indicate how difficult it is to shift the dominant operating culture of an established telecommunications company from an engineering perspective to a marketing perspective. Getting a company to adopt the formal trappings of a market-oriented organization is easy. Indeed, after AT&T created a marketing department in 1974, the number of planners exploded, and the volume of company documents about market strategies multiplied. Nonetheless, as AT&T executives freely acknowledge, making a genuine shift in vision shook the organization to its core. The same problem is bedeviling (NTT) and BT. Unless appropriate organizational incentives are implemented within the organization, dominant telephone companies resist change.<sup>14</sup>

On a more personal note, my father graduated from Columbia University in 1938 and my brother in 1973. For each generation, Columbia has maintained its own special style in everything from its emphasis on "lit-hum" and contemporary civilizations courses to its perverse pride in its underachieving football team. Government bureaucracies are no different. The Federal Communications Commission (FCC) has, to be sure, evolved since its establishment in the 1930s, but the Communications Act of 1934 (as amended) remains at the heart of U.S. policy and FCC practice.

My general approach in the remainder of this essay can be illustrated by using an inverted version of the myth of Sisyphus. Imagine a boulder atop a peak. Sisyphus can dislodge the boulder and send it hurtling down the mountain. He cannot determine its exact path, but he can affect the general direction of its descent. Once the boulder begins to roll down the mountain and pick up momentum, however, Sisyphus has little or no ability to modify its course in any major fashion. Therefore, to get the boulder as close as possible to the spot at which he hopes it will come to rest, Sisyphus needs to start things out in the right general direction.

#### 4. Past Models of Telecommunications Regulation

As we enter a new era of globalized networks, important choices face governments. Existing models of government regulation and intervention might provide some clues about how governments acting alone or together might attempt to manage, guide, influence, or regulate global networks, their operation, and their evolution. Pressured by the dramatic U.S. decision in 1982 to break up AT&T, many other countries have acted to reform their systems of telecommunications regulation as well. None of them, predictably, emulated the U.S. model. Each country chose to adopt some combination of liberalization, corporatization, privatization, reorganization, deregulation, and the introduction of competition. From this menu no single dominant choice emerged. And surprises abound. For example, the *Financial Times* notes with some irony that "in Latin America telecoms privatisation is advancing at a speed that make's Europe's progress appear positively glacial."<sup>15</sup> And few outside of Japan would have predicted that Japan would be a leader in telecommunications regulatory reform rather than a follower. Nonetheless, all major countries were pressured by similar political, economic, and technological factors.<sup>16</sup> Moreover, regulatory reform in key countries has forced all other countries to reconsider their strategic alternatives.

As a first step toward grasping the possible regulatory approaches available to governments for dealing with global networks, the following sections briefly review several models for telecommunications regulation that Peter Cowhey and I described some years ago.<sup>17</sup>

##### 4.1. The Scarcity Model

Before worrying about global networks, countries have to build a modern communications system. Many poor countries where the ideal of universal service is a distant dream still use a traditional "scarcity model." Communications is a benefit provided by a government-owned and -operated monopoly to such specialized clients as government ministries, the military, state enterprises, and occasionally foreign firms. Improved communications infrastructure is of relatively low priority for the central government planners. Money for investment is scarce because immediate return on investment is low or nonexistent. Telecommunications projects must compete with other development projects for attention and money. Telecommunications policy makers, of course, want to go beyond the scarcity model, but they lack the clout and the investment funds to finance modernization except when major customers demand services and help finance them.

#### **4.2. The Cash Cow Model**

As development proceeds and users demand more communications services, the "cash cow" model supplants the scarcity model, allowing national carriers to raise some prices, generate more revenues, and increase profits.<sup>18</sup> However, since finance ministries view telecommunications as a cash cow to be milked for funds to invest elsewhere, carriers are stripped of most of their profits. Although a few industrial countries such as Austria have taken this approach, it is most common in middle-level developing countries.

Governments favoring a cash cow approach have tried to use the communications system to integrate the nation socially, politically, and economically! The telephone system was supposed to extend throughout the country and at least had the goal of assuring minimal service to smaller towns. In fact, scarce funds flowed mostly to politically important urban centers. Regulators still assumed that the telephone network is a natural monopoly delivering standardized products to its customers. Large economies of scale made it logical for monopolists to cross subsidize politically favored groups. Thus, the telephone system might subsidize the postal system and the commercial publishing houses that use the mails. Large users subsidized rural users, smaller residential and commercial users, and phone system equipment manufacturers.

In short, under both the scarcity and the cash cow models pricing reinforced the vested interests of influential groups, making reform difficult. Cross subsidies are so institutionalized that only a major outside push can break the logjam and begin the process of reform and rebalancing of rates. But in an era in which global communications networks are crucial, countries that still favor a cash cow approach are under increasing pressure. Indeed, the pressure on the remaining countries to reconsider their systems grows.

#### **4.3. The Monopoly Modernization Model**

The telecommunications company becomes a tool of broad industrial policy when regulators adopt a "monopoly modernization model." This strategy turns telecommunications into a strategic advantage for attracting new commerce to a country. Under this model, the goal is to change the role of the national telephone company so that it is no longer treated as a cash cow for the government or other stakeholders in the telecommunications system. There are several variants of the monopoly modernization model. Governments may opt for administrative reforms to promote efficiency and sometimes competition. Radical changes in pricing policy may be introduced. (And some governments have used the telecommunications network as a "loss leader" for national development instead of running up profits.) This approach speeds up investment in new facilities and encourages more flexible innovation in the services offered, but it sacrifices the revenues that used to be diverted to the national treasury.

Singapore adopted this model; so did Spain. For years Hong Kong boasted a dynamic local monopoly that has promoted development in the absence of major competitors. Both Hong Kong's and Singapore's telcos are exceedingly profitable companies despite the low prices they charge, partly because lower prices encouraged greater use. (But, in fairness, their small geographic size and high population density also means that domestic operating costs for both countries was lower than almost anywhere else in the world.)

#### 4.4. The Boutique Model

The thrust toward modernization inherent in the monopoly modernization model is also found in the "boutique" and the "full competition" models.<sup>19</sup> If government leaders simply instruct the monopoly telephone company to change its ways, success is not guaranteed. Greater competition may be necessary to induce the transformation of the dominant phone company. The key difference involves the presumption of competition. Under a monopoly modernization approach, countries may permit limited competition in specialized segments of the market. These models are built on a presumption of competition. At issue is not whether there should be competition, but how much competition should be allowed in what market segments. Countries promote competition in a different mix of facilities, services, and equipment. More or less competition maybe permitted along any combination of these three dimensions. The European Community (E. C.) adopted, in essence, the boutique model as its guideline for Europe in 1992. If free choice is allowed on all three dimensions, then the boutique model evolves into a "free competition" model.

Countries introduce competition to promote their specific goals. Most countries always permitted some competition in the procurement of equipment, but greater competition is now the norm, particularly in the provision of customer premises equipment. Competition can be even more intense when foreign firms are allowed to compete in the provision of services. This can be accomplished on a limited basis through the sanctioning of international alliances and joint ventures. More dramatically, foreign firms may be permitted to compete for international or even domestic business.

Several variants of the boutique model exist. A mild alternative might distinguish between basic and value-added (or enhanced) services. Originally inspired by the notion that computer-related services could be distinguished successfully from voice services, this approach was popular in the first wave of reform in the 1980s. (French policy in the early 1980s provides a good example of the first wave of boutique models.) It now is giving way to more far-reaching variants. This approach keeps the system virtually unchanged for the average user, but larger users benefit from vigorous competition in services that concern them. Sometimes, however, distinguishing between basic and enhanced services can be messy, and efficient competition between the national telephone company (which controls the basic circuits) and its domestic and foreign value-added competitors is difficult to assure. Similarly, preventing the phone companies from reclassifying basic phone services as value-added services can be an equally troublesome proposition.

A more competitive variant of the boutique model might distinguish between facilities and services (i.e., between the physical infrastructure such as transmission and central office switches and the services provided over the infrastructure). A country might maintain a facilities monopoly and still sanction competition in service providers on these facilities. If everyone uses common facilities on the same terms, differences among services providers would reflect relative efficiencies. But if a service provider also owns the facilities it may cross subsidize its offerings. In addition, society could suffer if owners charge too much for their facilities. There is also a danger of underinvestment because government owners of monopoly facilities may be tempted to transfer revenues to the general treasury rather than reinvest in communications facilities.



#### **4.5. Full Competition Model**

When countries allow relatively unrestricted entry into facilities and services they have moved to the "full competition" model. Variants on full competition have emerged in the troika of major telecommunications reforms. A first alternative allows competition in the provision of both long distance and local communications services but explicitly limits the total number of competitors providing telephone service as well as the number of competitors who may provide facilities and basic phone services. This mix of regulation and competition now exists in Japan, the United Kingdom, and Canada.

By limiting the number of facilities providers and the number of carriers providing basic telephone services these countries hope to control prices and profits and still allow for some subsidy of residential and rural users. These countries seek unlimited competition in value-added services and some competitive discipline on the provision of basic services. Problems arise, however, because none of these countries had broken up its long established telephone company, so the dominant carrier still provides end-to-end service throughout the country. Newcomers must struggle against the established giant.

Second, in the United States the local phone service retains its monopoly status. Otherwise, there is free competition. When the United States broke up AT&T on January 1, 1984, it launched a sea change.<sup>20</sup> On paper the U.S. solution was neat, but it raised major problems involving such questions as the opportunities provided to privately held local telephone companies, the commitment of regulators to cross subsidize small users, and the ability to assure fair competition between major public networks and specialized carriers. It is also unclear how the pieces of the telecommunications and information networks of the future will fit together.

Third, a full competition boutique model is approached in New Zealand, a country with only 3.5 million inhabitants that embarked on bold liberalization and privatization in 1989 to allow competition everywhere, including the local loop.

#### **4.6. Global Network Model**

The five models just described are national in character. Telecommunications companies provide international services through a series of agreements and alliances that in effect cartelize the world. The rules were designed to reduce competition in pricing or routing of international traffic and require users to rely on authorized international carriers to get international services. Thus, each national carrier was almost unchallenged in its control of rates and terms of service for its country's outgoing traffic. An alternative, "global communication" model built on the idea of an "international digital highway" seeks to create an integrated global communications company that can send a signal around the world on its own facilities. Cable & Wireless was the first firm to adopt this vision. Since then a series of global alliances has emerged the goal of which is to provide one-stop, around-the-world service.

In summary, the discussion of these alternative models demonstrates that countries have experimented with numerous distinct regulatory approaches, each built on their own assumptions, objectives, and regulatory philosophy. The choice of regulatory models could influence the distribution of winners and losers worldwide.

## 5. Regulatory Issues and Policy Approaches Suggested by Global Networks

If networks are global and national regulation is inefficient and insufficient, what should governments do? There are some precedents. Most prominently, the rise of the Eurocurrency market in the 1970s undercut the efficacy of national monetary policies and bank supervision. By moving money, banks could frustrate, for example, tight money policies or provoke foreign exchange crises. After the collapse of the Bankhaus Herstatt in 1974, central bankers allotted bank supervisory responsibility for some activities and agreed to collaborate in other areas through the signing of the Basle Concordat. As in banking, the rise of global networks will undermine the ability of national regulators to control their own carriers as they had previously. At first they will deny their clout has been undermined and will struggle to reimpose their authority. But ultimately unless regulators choose to sit on the sidelines and let global networks emerge unfettered (unlikely), they will need to collaborate on some key global issues. The following sections briefly discuss four issues related to global networks that will need to be addressed on a supranational basis. The final section of this essay will then consider some areas where government regulators may continue to act on their own in the future and suggests other areas where they should cease to intervene.

### 5.1. Jurisdictional Questions

The proliferation of global networks forces decisions to be made regarding who has oversight powers with respect to policy. In many countries, problems of oversight were left largely to the communications and finance ministries. In other countries, officials generally let national telephone companies act on their own. Current developments raise important questions about traditional regulatory practices, particularly about the division of authority between national regulators, the International Telecommunication Union (ITU), Intelsat, and perhaps the General Agreement on Tariffs and Trade (GATT). One possible approach would be for communications ministries to concentrate on industrial policy issues and regulatory commissions and phone companies to worry about day-to-day policy and operations. Under pressure from the GATT, which is trying to trespass into areas previously reserved for the ITU, the ITU may ultimately be forced to undertake more serious reforms.<sup>21</sup>

A subtler problem for oversight involves the representation of interest groups. Countries restructuring telecommunications competition reorganize the ways in which interests are represented. This could be a problem because industry associations play a quasi-policy role in many countries. These associations may write technical standards or make recommendations about pricing and services that have enormous impact.

### 5.2. Standard Setting

One reason foreign firms enter corporate alliances is to improve their access to the European (and Japanese) standards process and to tap their experience in preparing for variations on global technologies. (Specialized consultative bodies are setting standards for processes that in the past were not transparent or easily accessible to foreigners.) One problem for foreign firms after entry is that consortia often have elaborate terms and conditions concerning the sharing of technology, which poses the question of whether the individual firm's intentions about sharing technology are consistent with those of the country's firms in general.<sup>22</sup>

The politics of standard setting becomes critical for competitiveness in an age of global networks. To illustrate, the E.C. has made progress in setting technical standards internally. Some programs, notably the E.C.'s (RACE) effort, were designed to help define its policy goals concerning technical standards. Using the principle of mutual recognition, E.C. members must recognize the standards of other members in the absence of a binding E.C.-wide standard. Should trade rules concerning transparency and access to the decision-making processes apply to network standards? Similarly, can antitrust policies be applied consistently to R&D consortia that include the E.C. as a partner? One principle national regulators might agree to with regard to technical standards is beginning to stand out: foreign companies should be granted access to the deliberations of standard-setting (and R&D) consortia if these consortia are used to make trade-related policies, such as the early development of technical standards.

### 5.3. Pricing

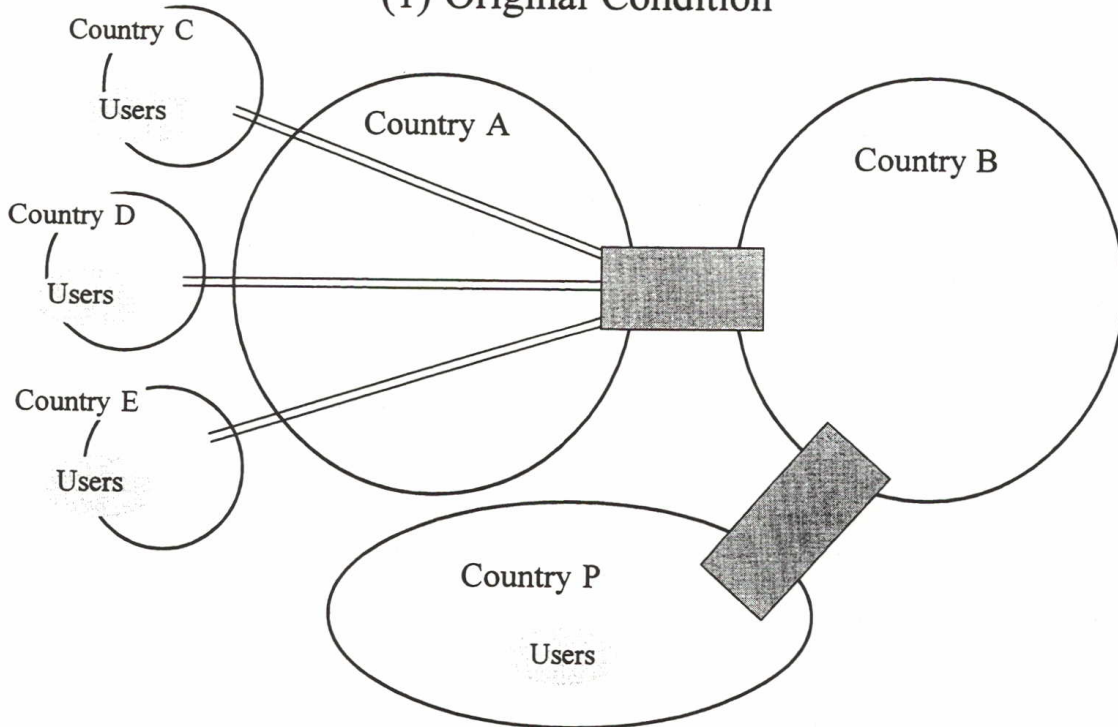
Another dimension of oversight involves pricing policy. The ability to resolve pricing disputes among public authorities is affected by the design of regulatory institutions. When long distance calls were considered jointly provided services (and even to a large extent still today), the messages carried over the cables are, in theory, handed off at the midway point between the sending and receiving country. Each national telephone company is allowed to charge its own customers whatever rate it wants for the international message (the collection rate). At the same time, each pair of carriers negotiates a rate per paid minute of traffic that they use to settle any imbalances of traffic flow between them (the accounting rate). Accounting rate revenues are then divided between the two carriers, usually on a fifty-fifty basis (the settlement rate). The accounting rate system provides a contractual mechanism for sharing revenues among two legally distinct entities that are jointly engaged in providing international services.<sup>23</sup>

Traditionally, international routes were incredibly profitable for the carriers. Today, under pressure from large users, there are multiple carriers plying many routes and resellers trying to skim the cream of the international business. As prices began to fall, voice, fax, and data volume have skyrocketed. Nonetheless, even after rate rebalancing international routes remain exceptionally profitable for the carriers.

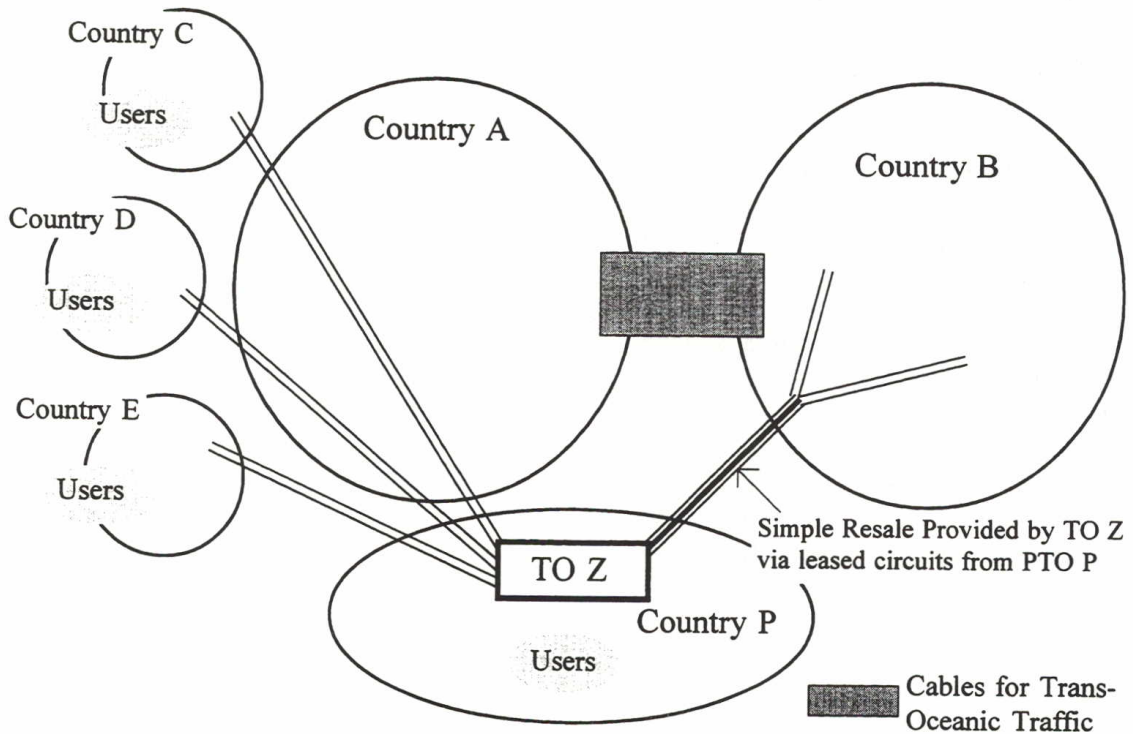
With the advent of global networks, the situation is beginning to change. Users want to be connected wherever they want and whenever they want with appropriate quality, security, and price.<sup>24</sup> They may construct and operate their own leased-line network or, if the price and service is right, let someone do it for them. Large users, convinced that integrated communications is a key to global competitiveness, demanded the capability to smoothly interconnect their operations. To meet these demands global network providers have promised to provide global, unified billing systems. To the extent that these systems compete across the board the customers are likely to benefit, particularly if they do not feel trapped and locked in to a single global service network. Governments may be used from time to time to help make certain that lock-in does not occur. By the same token, countries unable or unwilling to allow the large users to plug in risk losing their business. An example is the fast-growing business in international conferences. The combination of excellent communications, accommodations, and transportation boosted Singapore while India suffered. Inevitably, the introduction of competition pushed collection rates down. Efforts are underway in Study Group III of the ITU to reduce charges steadily. Trade officials meeting under the auspices of the OECD and pushed by the United States and its main international carriers seek even greater reforms and faster price reductions.<sup>25</sup>

# Figure 1 Simple Resale

## (1) Original Condition



## (2) Potential Competition between PTO A and a TO in Country P



\* TO = Telecommunications Operator

#### 5.4. Global Antitrust

Another question raised by global networks involves how governments should respond as globalization of carriers and the proliferation of alliances proceeds. It is likely that the importance of intergovernmental coordination on antitrust law will increase. Governments are likely to establish global antitrust rules to provide direct oversight of firms and alliances, including providers of global networks.

Some form of antitrust or competition policy exists in all the OECD countries. But most countries traditionally did not enforce or rely on antitrust laws as a primary instrument of competition policy. From the viewpoint of the global regime, as long as the United States was the pivot of world markets, American antitrust law provided de facto scrutiny of the system of world commerce. Today, this informal authority is weakening, and the standards for judging antitrust violations will inevitably differ. But before global antitrust is accepted, governments would need to develop general understandings about fair competition simply to orient and begin to harmonize their individual policies.

#### References

- Adonis, Andrew. "Privatisation and Liberalisation outside Europe: Rapid Advances Worldwide." *Financial Times*, special section on international telecommunications, October 18, 1993, p. 5.
- Aronson, Jonathan D. "Communications, Diplomacy, and International Relations," *Relazioni Internazionale* (Milan), March 1991, pp. 100-107.
- and Peter F. Cowhey. *When Countries Talk: International Trade in Telecommunications Services*. Cambridge, MA: Ballinger, 1988.
- Attali, Jacques. *Millennium*. New York: Times Books, 1992.
- Axilrod, Stephen. *Interdependence of Capital Markets and Policy Implications*. Occasional Papers, No. 32. Washington, D.C.: Group of Thirty, 1990.
- Bateson, Gregory. Personal communication with author.
- Cowhey, Peter, and Jonathan D. Aronson. "Trade in Services and Changes in the World Telecommunications System." In *Changing Networks: Mexico's Telecommunications Options*, pp. 5-49. Edited by P. Cowhey, J. Aronson, and Szekely. La Jolla: University of California, San Diego, 1989.
- , and Jonathan D. Aronson. "The ITU in Transition," *Telecommunications Policy* 15, no. 4 (August 1991): pp. 298-310.
- , and Jonathan D. Aronson. *Managing the World Economy: The Consequences of Corporate Alliances*. New York: Council on Foreign Relations, 1993.
- Daly, Herman E. "The Peril of Free Trade." *Scientific American*, November 1993, pp. 50-57.
- Ehrlich, Paul R. *The Population Bomb*. New York: Sierra Club/Ballantine Books, 1968.
- Ergas, Henry, and Paul Paterson. "The Joint Provision of International Telecommunications Services: An Economic Analysis of Alternative Settlement Arrangements." A paper prepared for the eighth International Telecommunication Society international conference, Venice, March 18-21, 1990.

- Fisher, Francis D. "What the Coming Telecommunications Infrastructure Could Mean to Our Family." *A National Information Network: Changing Our Lives in the 21st Century*, annual review of the Institute for Information Studies. Queenstown, MD: Aspen Institute, 1992).
- Frieden, Robert M. "Accounting Rates: The Business of International Telecommunications and the Incentive to Cheat." *Federal Communications Law Journal* 43, no. 2 (April 1991): pp. 111-39.
- Kennedy, Paul. *Preparing for the Twenty-First Century*. New York: Random House, 1992.
- Sagan, Carl, and Richard Turco. *A Path Where No Man Thought: Nuclear Winter and the End of the Arms Race*. New York: Random House, 1990.
- Schorr, Burt. "Computers' Marriage to Communications to Yield Big Benefits -- If It Ever Occurs." *Wall Street Journal*, November 2, 1977, p. 40.
- Shawcross, William. *Murdoch*. New York: Simon & Schuster, 1992.
- Spero, Joan. "Guiding International Finance." *Foreign Policy* #73 Winter 1988-89 p114-34.
- Temin, Peter, with Louis Galambos. *The Fall of the Bell System*. New York: Cambridge University Press, 1987.
- World Bank. *World Development Report 1992: The Widening Gap in Global Opportunities*. New York: Oxford University Press, 1993.

### Endnotes

1. At its most fantastic, see George Gilder's various works. A more interesting exposition is Fisher (1992), pp. 1-18. There also exist, of course, pessimists such as A. Michael Noll, the Dean of the Annenberg School at the University of Southern California, who believe that much of the technological babble is mere hype that for a long time to come will have minimal real impact on communications.
2. Shawcross (1992).
3. Personal communication with author.
4. Ehrlich (1968).
5. For a thoroughly depressing review, see Kennedy (1992). Kennedy is long on analysis but short on solutions. One hopes, however, that the answer is not the one described in Sagan and Turco (1990).
6. The World Bank (1993), p. 36.
7. We rarely think of the downside possibilities. When two vehicles collide because their busy drivers are distracted talking on their cellular phones, is this a net plus? If a passing child is killed in the accident, would a California court find the cellular provider guilty of damages? It might. For a similar analysis of another current issue, see Daly (1993), pp. 50-57. Daly argues that "free trade" ought to be relabeled as "deregulated international commerce." And as the U.S. savings and loan fiasco showed, deregulation is not always a success.
8. Predictions of merger always outrun reality. To illustrate this, the earliest article on the merging of communications and computers that I found in my files was Schorr (1977), p. 40.
9. See Cowhey and Aronson (1993), pp. 80-88.
10. See Axilrod (1990).

11. Spero (19??).
12. Aronson (1991), pp. 100-107.
13. Attali (1992).
14. There is a profound difference between an engineering and a marketing perspective. Engineers begin with a vision of how the technology works and a sense of what users should need in an orderly evolution of technological innovation. A market-oriented company begins with the assumption that users may have unpredictable needs that will evolve in ways not easily planned. The core of the engineering task of a marketing company is to rapidly evolve and adapt technologies and systems as customers define their needs. This requires an approach to designing technology that is much more flexible than that of an engineer.
15. Adonis (1993), p. 5.
16. See Aronson and Cowhey (1988), pp. 19-35.
17. This section draws heavily on Cowhey and Aronson (1989), pp. 5-49.
18. Eli Noam has suggested a variant of this model, which he labels as a "cost-sharing model."
19. Eli Noam suggests a similar model that he terms a "pluralistic model." Competition on various dimensions is likely to be introduced.
20. The most systematic account of the bargaining that led up to the breakup of AT&T is found in Temin with Galambos (1987).
21. See Cowhey and Aronson (1991), pp. 298-310.
22. In the fall of 1991, as an experiment the ITU made many of its standards available on-line through a file server in Boulder, Colorado. Many large users, especially European firms that previously found it difficult and expensive to obtain technical standards, kept the transatlantic lines busy as they downloaded the standards. Their own telecommunications operators had little incentive to make it easy for them to know and understand international communications standards -- they might, after all, decide to become competitors.
23. See Ergas and Paterson (1990) and Frieden (1991), pp. 111-39.
24. In the early 1960s only seven U.S. banks operated foreign branches. When large U.S. firms started to move abroad, banks were faced with a choice: follow them or risk losing their business at home as well as abroad. By the same token, the phone company that does not provide global coverage in the future risks losing customers to companies that do.
25. AT&T and MCI were firmly behind U.S. efforts to achieve more transparency in settlement rates. By contrast, Canada was reluctant to open up the numbers, presumably because Teleglobe gained some small bargaining advantage because it knew AT&T's rates but kept its own rates confidential.