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THE INFORMATION REVOLUTION AND INTERNATIONAL TELECOMMUNICATIONS

Daniel J. Shaw
Economics Division

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THE INFORMATION REVOLUTION AND INTERNATIONAL TELECOMMUNICATIONS

Telecommunications is changing, both in Canada and around the world. No longer can countries be telecommunications islands.

James Meenan, AT&T Canada Corporation

INTRODUCTION

The technologies employed by telecommunications and cable television companies in Canada and elsewhere are undergoing a rapid transformation; consequently, so are the services they can deliver. No longer do these enterprises rely exclusively on copper wire or coaxial cable as their primary transmission media; increasingly, their networks use fibre-optic cable, which carries information on a pulse of light, and wireless systems, which make use of the electromagnetic spectrum. The Internet, a network of computer networks, and its amazing array of new software applications is also a revolutionary means of carrying information that both complements and competes with more traditional means.

These technology developments also foster the globalization of commerce. Combined with new, relatively low-cost transportation, the new communications technologies and services have led to the proliferation of trade beyond the traditional borders of nation-states. Moreover, a disproportionate share of this trade is conducted by multi-national or, more precisely, transnational corporations, whose investment decisions appear increasingly to be made strictly on economic grounds rather than on accidents of history or geo-politics. This new environment presents Canada with the serious challenge of remaining competitive internationally amid threats to its traditional sectoral share of such investment. The "Information Revolution" can be a double-edged sword.

This challenge is not imposed only on individuals and their businesses, but also on the federal government, which, as it has the exclusive responsibility for telecommunications and broadcasting policy in Canada, must provide legislation and policy that responds to the social, cultural, political and economic circumstances of the day. The demise of technologies characterized by "natural monopoly" conditions, and the re-configuration of telecommunications and broadcasting activities along global, rather than national, lines means that public policy must be re-designed accordingly. It must now provide new broad ground rules for incumbent as well as new entrant telecommunications and broadcast distribution companies engaged in both the domestic and international arenas. The significance of this policy reformulation cannot be overstated. This paper describes the new status of international telecommunications and addresses both the political-economic institutional responses and related international developments.

TRANSNATIONAL CORPORATIONS AND INTERNATIONAL TELECOMMUNICATIONS

Recent developments and enhancements in telecommunications technologies, along with improved aircraft, liberalized and re-configured "hub-and-spoke" airline networks, international air and ground carrier alliances (including code sharing and harmonized frequent-flyer programs), and inter-modal transport containers are all contributing to the globalization of markets.(1) They have also been the main catalysts of the Information Revolution which, as it leads to the "Information-based Society," promises to be no less important than previous social revolutions.

The Industrial Revolution included institutional changes, such as corporate governance charters, limited liability rules, liberalized freedom of contract codes, the emergence of a stock market and aggregated physical and financial capital to take advantage of new production techniques based on economies of scale. The modern corporation was the primary instrument for coordinating these developments. Constraining this revolution, however, was the fact that railways and communications networks were limited to national markets and in some

(1) Richard G. Lipsey and Cliff Bekar, "A Structuralist View of Technical Change and Economic Growth," in Thomas J. Coucherne, *Technology, Information and Public Policy*, John Deutsch Institute for Public Policy, Queen's University, Kingston, 1994, p. 9-75.

aspects subject to natural monopoly conditions. International transportation and communications networks thus came about by "pasting" developed country networks on to an international grid with minimal and monopoly linkages. Obviously, this structure did not greatly consider economic efficiency; other economic and political pressures would have to bring this about.

Recent innovations in transportation and communications, however, have pushed corporate-based production beyond the boundaries of national markets and natural monopoly. For example, while voice and data communications and entertainment services were formerly the distinct preserves of, respectively, telephone, satellite and cable television companies, they can now be provided over each other's transmission facilities, primarily because of the move to digital technologies. The dissolution of conventional boundaries between telecommunications, cable television and computer activities is paving the way for the convergence of information carriage services in the "Information Highway." We are witnessing the demise of natural monopoly as indirect competition takes root, primarily through alternative transmission technologies. Direct competition can take place only after complete deregulation.

Moreover, the newest telecommunications technologies are contributing to the birth (some say re-birth) of alternative distribution channels, such as direct advertising, novel marketing and selling strategies, and retail-warehousing systems. These enable companies to better take advantage of "just-in-time" inventory, electronic data interchange, and computer systems for airline reservation, electronic banking and shopping, in order to enhance the traditional manufacturer-wholesaler-retailer distribution chain, or to circumvent it when this is economically feasible. More direct distribution systems, made possible by the modern information technologies, obviously transcend national borders and offer savings that will undoubtedly contribute to the competitiveness of the business sector. These innovations, coupled with institutional changes such as the successful Uruguay Round negotiations of the General Agreement on Tariffs and Trade ("GATT") and the North American Free Trade Agreement ("NAFTA"), enhance international commerce, trade and competition and increase national wealth.

Thus, today, corporations on the cutting-edge are acquiring their production inputs worldwide, depending on the best combination of lowest cost and highest quality and reliability; they are also using just-in-time inventory and flexible manufacturing techniques[(2)] to produce and market more efficiently brands, based on core company products, to an international

(2) See Michael E. Porter, *The Competitive Advantage of Nations*, The Free Press, New York, 1990.

market with its vastly heterogeneous tastes. Brand name recognition can conceivably become international now that broadcasting services can be marketed worldwide more economically. Together, these re-configured production and marketing techniques make intra- and inter-corporate communications more critical than ever. The result is increased international and intra-corporate trade, particularly in telecommunications services.

International telecommunications traffic amounted to 47.7 billion minutes in 1993. On a per capita basis, this averages just over nine minutes globally, but 46.5 minutes in high-income countries. Perhaps more importantly, the compound average annual growth rate of international telecommunications over the 1983-1993 period was 14% – approximately double the growth in domestic telecommunications activity in most industrialized countries.(3) In terms of market value, the Organisation for Economic Co-operation and Development (OECD) countries generated in the order of US$35.9 billion in revenues from international telecommunications in 1992, about 9% of total telecommunications carrier revenues in those countries.(4) Clearly, these statistics show how recent developments in telecommunications technologies are pushing political-economic institutions towards globalization.

GLOBAL NETWORKS: DIRECT FOREIGN INVESTMENT AND INTERNATIONAL ALLIANCES

The demise of natural monopoly in telecommunications services has also led many countries to gradual liberalization of their domestic markets; that is, to deregulation of prices and market entry and to privatization of former public telephone companies. These pro-competition policies have provided many opportunities for new companies, which, in turn, have stimulated demand for more and new services. While industry entrants have been of domestic origin, the more important and substantial *de novo* domestic competitors have been foreign-based telecommunications companies. It must be remembered that domestic companies are generally a more expensive source of capital because greater financial risk is involved and because they are often further burdened by a prolonged and steep managerial learning curve. Foreign-based companies, on the other hand (whose investments have been direct and indirect, as well as horizontal and vertical), almost immediately provide the receiving country with effective competition.

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(3) ITU, *World Telecommunication Indicators 1994/95*, 1995, Table 13, p. 39.

(4) OECD, *Communications Outlook 1995*, Tables 3.9 and 3.10, p. 33 and 34, respectively.

Through direct foreign investment ("DFI"), foreign financial capital is provided to a host country company, usually along with imported technology, varying degrees of technological know-how, and managerial expertise. This capital is of the active, hands-on sort, rather than the passive, institutional variety so these highly-valued tie-ins are usually directly correlated with the level of foreign ownership at stake. In telecommunications, indirect investment, more often than not, means an alliance, but sometimes includes an equity stake through a joint venture company. In a horizontal investment, the DFI or alliance would simply provide joint and complementary telecommunications services, while a vertical investment might provide multi-media content and distribution services, telecommunications equipment, or hardware/software products. The benefits of such investments to the receiving country are numerous. For example:

> The member companies of Stentor, working together, negotiate various relationships with other players. ... we currently have a relationship with MCI wherein we use the technology that they have developed for virtual network services. We were trying to develop that technology ourselves, but the costs were prohibitive, and we would not have been able to get it to market at a time when our customers needed that service.(5)

Entering a foreign market offers the investing telecommunications company both strategic and non-strategic demand and supply advantages. Market-oriented investments generally make it easier to serve a customer direct rather than through a third party and, in addition, the companies receive subsidies from the host country in the form of more favourable regulatory treatment than is granted to the dominant domestic telephone company. Cost-oriented investments usually spread R&D expenditures more widely and avoid excessive and discriminatory accounting rates.(6)

The driving force behind international alliances is apparently the brisk demand for so-called "seamless" global communications services. Transnational corporations are seeking to

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(5) Brian Canfield, BC Tel, Senate of Canada, *Proceedings of the Standing Senate Committee on Transport and Communications*, First Session, Thirty-Fifth Parliament 1994-95, Issue No. 16, p. 37.

(6) The telephone company originating an international call charges the customer its tariff, which in industry circles is called the collection charge. Since the original telephone company requires access to a foreign telephone company to "terminate" (complete) the call, a fee to that second telephone company is required. This fee, which is often negotiated bilaterally between ITU member states, is referred to as the accounting rate. It is usually shared on a 50/50 percentage basis, despite the fact that the costs of originating the call exceed the costs of termination.

replace their private, in-house tele-communications networks, which have been described as a patchwork of separate but similar services procured from incompatible host-country transmission equipment, built to inconsistent technical standards. Alliances between world-renowned telecommunications companies linking complementary products and services offer transnational corporations one-stop-shopping and systems-integrated, relatively hassle-free internal and external communications products and services. Some observers also mention the benefits of currency hedging, which is implicit in one-currency pricing policies.(7)

Bell Canada Limited explains its Concert alliance, premiering MCI and British Telecom plc ("BT"), as follows:

> As everyone knows, with the globalization of business and with communications being such an important part of success in business nowadays, there is a great advantage in offering seamless services ... that a customer will recognize as the same in every country and which will operate across national borders, and no operators could do that alone. You really have to team up with operators in other countries to offer those services, and you need to spend the money to develop the software and the platforms to deliver them.(8)

Figure 1 provides an organizational chart of the Concert partnership.

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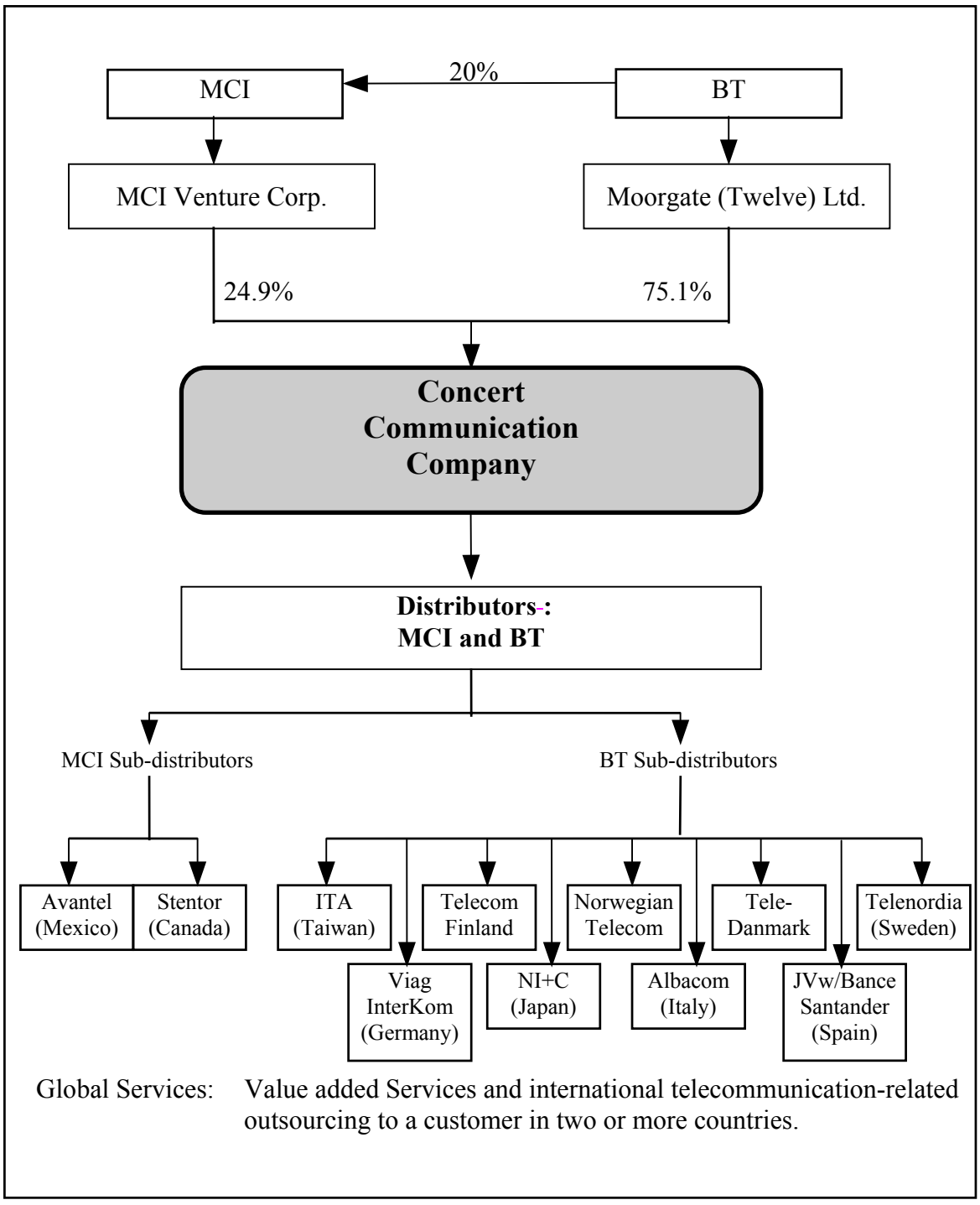
(7) Hudson Janisch and David Ujimoto*, Foreign Ownership and International Alliances: Implications for Domestic Regulation*, unpublished manuscript, November 1995, p. 4.

(8) Bernard Courtois, Bell Canada Limited, Senate of Canada, *Proceedings of the Standing Senate Committee on Transport and Communications*, First Session, Thirty-Fifth Parliament 1994-95, Issue No. 36, p. 17.

Figure 1
The Concert Alliance



Source: TeleGeography, Inc., *TeleGeography 1995: Global Communications Traffic Statistics & Commentary*, p. 10.

AT&T Canada Corporation explains its WorldPartners alliance, whose organization is shown in Figure 2, in the following way:

> Consumers today are becoming increasingly global in their operations. As a result, they want seemless services; services that they can access and that are reliable, regardless of where they are in the world. In general, they do not care who provides what, as long as they are receiving reliable services that they need at reasonable prices. World-class seemless services are vital for many businesses to be competitive in today's environment. To help provide these services, telecom companies are also increasingly forming international alliances. Whether it is the WorldPartners Group, of which AT&T is a member, other alliances our competitors are establishing, these alliances are being formed to provide these types of services that customers are demanding. They are a sign that these companies acknowledge that, regardless of their size and expertise, they cannot continue to go it alone and still provide the type of seemless service their customers are demanding.(9)

The third alliance of the three international majors is the Phoenix Alliance, which led by Sprint Corporation. The organizational structure of this alliance is featured in Figure 3.

An international alliance would not, in general, incorporate a mix of large and small telecommunications companies; however, this does not mean that international alliances are restricted to the giants of the industry, nor does it mean that they are strictly global in scope. Clearnet Communications Inc. appears to have struck a continental alliance:

> We have found our relations with Motorola and Nextel to be most advantageous. Nextel and Clearnet share material interests as operators and as common customers of Motorola. ... With Nextel, for example, we can offer services at the border. The radio signals actually cross the border — they do not end at the border — so people can travel to Los Angeles using a Nextel system and travel to Toronto or Montreal and use the Clearnet system.(10)

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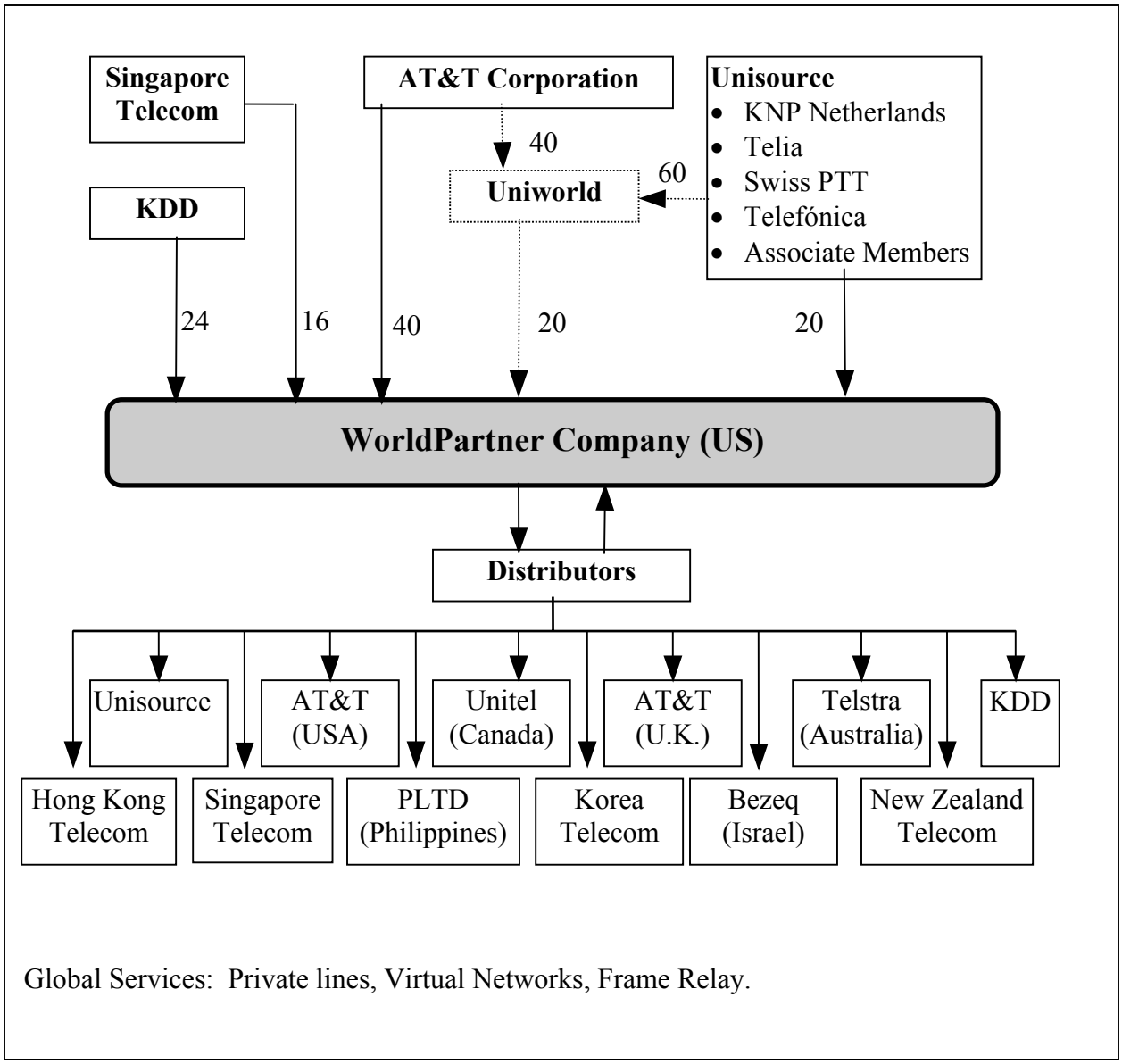
(9) James Meenan, AT&T Canada Corporation, Senate of Canada, *Proceedings of the Standing Senate Committee on Transport and Communications*, First Session, Thirty-Fifth Parliament 1994-95, Issue No. 35, p. 5.

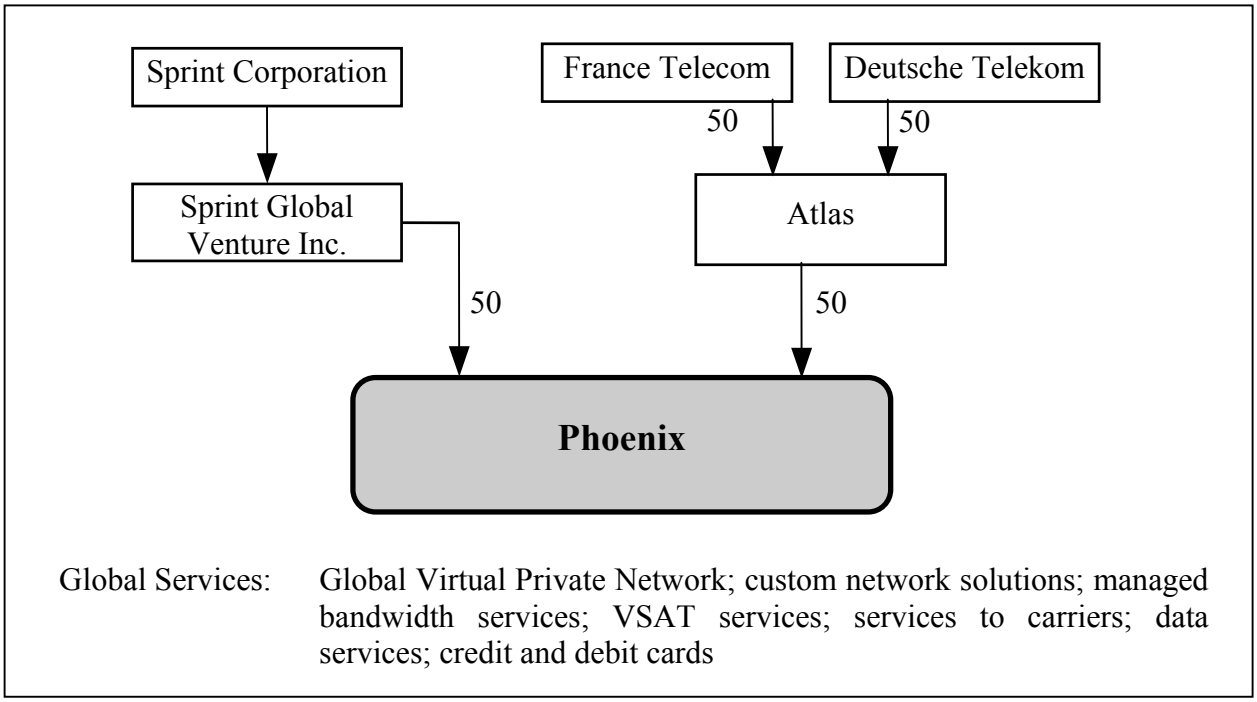
(10) Robert C. Simmonds, Clearnet Communications Inc., Senate of Canada, *Proceedings of the Standing Senate Committee on Transport and Communications*, First Session, Thirty-Fifth Parliament 1994-95, Issue No. 33, p. 15.

Figure 2
The WorldPartner Alliance



Source: TeleGeography, Inc., *TeleGeography 1995: Global Communications Traffic Statistics & Commentary*, p. 8.

Figure 3
The Phoenix Alliance



Source: TeleGeography, Inc., *TeleGeography 1995: Global Communications Traffic Statistics & Commentary*, p. 12.

THE INTERNATIONAL TRADING REGIME AND THE GATS

The greater demand for international telecommunications services and liberalized domestic telecommunications are forcing countries, particularly those with persistent annual net trade outflows, to examine the present telecommunications trading regime. In this regard, a review of the history of international telecommunications is instructive.

From the beginning, international telecommunications were treated as an extension of national telecommunications. Matters of interconnection, technical standards and tariffication were the preserve of the International Telecommunication Union ("ITU"). The ITU, which is now a wing of the United Nations ("UN") and has far more signatory members than the UN itself, was formed in 1932 with the merger of the International Telegraph Union (which is the oldest surviving international organization, dating back to 1865) and the International Radiotelegraph Convention. International telecommunications policy matters thus developed in an atmosphere of consultation and cooperation amongst government departments and agencies of

ITU member states. ITU officials were not trade specialists, rather they were telecommunications specialists; consequently, they were not guided by international trade issues and policy, but by domestic telecommunications regulatory regimes and policies.

Thus, international telecommunications have come to reflect the domestic regulatory objectives of ITU member states, as dictated by former economic conditions when telecommunications technologies were said to be subject to natural monopoly and network externalities.(11) Hence, domestic telco monopolies supervised by domestic regulators usually set collection charges for international telecommunications according to a policy whereby long distance services were cross-subsidized by local services; only accounting rates were negotiated with ITU member states. Simply put, collection charges, in part due to accounting rates, are excessive and discriminatory.(12) Indeed:

> Teleglobe Canada continues to have an exclusive mandate, or in plain words, a monopoly in Canada on all overseas telecommunications. ... Teleglobe rates and services are not competitive. In fact, Teleglobe's own evidence submitted to the CRTC in a recent proceeding demonstrated that there is considerable bypass of Teleglobe's facilities by routing traffic through the U.S. That is because Teleglobe's rates are not competitive with those of the U.S.-based international carriers.(13)

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(11) A benefit that accrues to existing members of a network from the addition of others is called an external economic benefit or "positive externatility." In the interest of economic efficiency, this externality can provide a necessary condition for government intervention. Such intervention, whatever its form, would have to be the least costly instrument to obtain the desired objectives, which would also assess private-sector contractual arrangements; the external economic benefit could be no less than this cost.

(12) See OECD, *International Telecommunication Tariffs: Charging Practices and Procedures*, 1994.

(13) Michael Kedar, GeoReach Telecommunications Inc., Senate of Canada, *Proceedings of the Standing Senate Committee on Transport and Communications*, First Session, Thirty-Fifth Parliament 1994-95, Issue No. 32, p. 6-7.

Figure 4

International Business Tariff Basket Index
Competitive and Non-Competitive OECD Countries – 1990-94

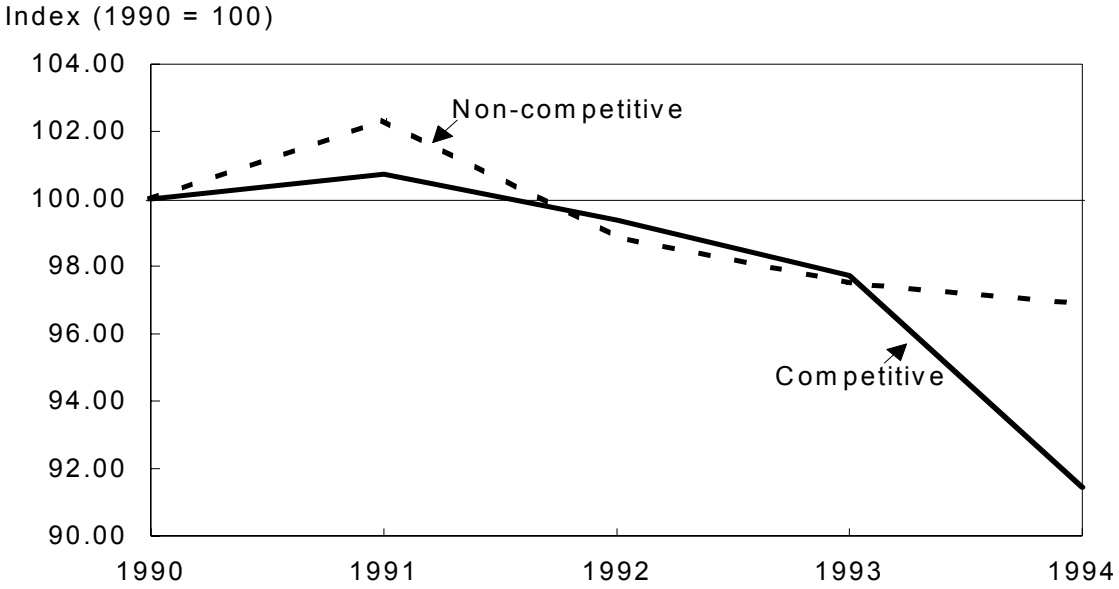
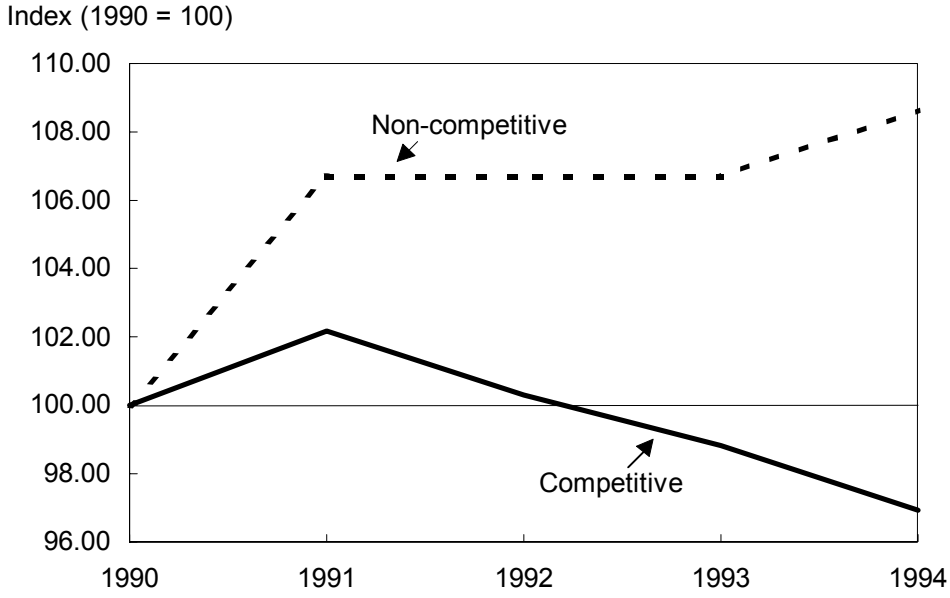


Figure 5
International Residential Tariff Basket Index
Competitive and Non-Competitive OECD Countries – 1990-94



Source: OECD, *Communications Outlook 1995*, p. 71 and 73.

Considerable deregulation has now taken place in many nations. Figures 4 and 5 clearly demonstrate that competitive forces have reduced tariffs for international telecommunications services. Business tariffs in OECD countries that have introduced competition to their telecommunications markets declined on average by 8.6% between 1990 and 1994, and dragged down the business tariffs of non-liberalized countries by 3.1%. Average residential tariffs, on the other hand, have declined by only 3.1% in liberalized OECD countries, while they have increased by 8.7% in non-liberalized countries. There are other important changes: the greater the distance of the call, the greater has been the decline in international prices; the ratio of usage charges to fixed charges has fallen in countries where total charges declined and risen in countries where total charges increased.

While these by-pass methods are to some extent leading to more rational international pricing structures, by themselves they are insufficient to the task. Otherwise, we would not see the large and persistent price differentials between countries with and without liberalized telecommunications markets. Countries without liberalized markets have no incentive to reform international pricing; their monopoly telcos still capture substantial economic rent through high collection charges and accounting rates as their monopoly telephone networks are needed to terminate any telecommunications transaction. Moreover, ITU procedures are based on secretive and bilateral negotiations for co-operative production of international telecommunications services, with revenues shared by the providers of each member state. Such procedures make it unlikely that there will be any movement towards more rational prices.

While such pricing policies were sustainable in a monopoly era, they are coming under great pressure for reform in the new competitive environment. With the advent of choice and competition in telecommunications, uneconomic by-pass has emerged as a way of confounding collection charges and accounting rates that are not commensurate with their costs. “Call me back” strategies by consumers, usually inside families or companies, and “call home direct” and “home beyond” services offered by many of the telecommunications companies are meant to overcome excessive telecommunications prices.

Thus, telecommunications are being conducted uneconomically, and all consumers, from liberalized and regulated telco countries alike, suffer as a result. Thus, the large unexploited gains to trade can be captured only in a broader forum that includes other commercial services and goods. The appropriate place for reforming international

telecommunications tariff policies is at the negotiating table of the General Agreement on Trade in Services ("GATS") set up by the World Trade Organization ("WTO").

The GATS enables countries to modulate the extent, breadth and speed of international telecommunications trade through the Negotiating Group on Basic Telecommunications ("NGBT"), which comprises OECD countries and several major developing countries. NGBT could provide a forum for reaching multilateral agreements on a more open trading regime in telecommunications services, covering issues such as greater market access, Most-Favoured Nation status, and transparency in telecommunications regulations. Its deadline for conclusion has recently been extended by one year, until 30 April 1997.

For Canada, a multilateral agreement would have three advantages over a regional agreement such as the NAFTA. First, there would be a greater probability of resolving trade imbalances with countries notorious for excessive accounting rates. Second, it would provide more balanced bargaining power to participants; that is, it would reduce the clout wielded by the U.S. in bilateral or regional agreements. Third, it would raise the possibility of obtaining Canada's long-standing desire for "rough equivalence" or "selective reciprocity" (rather than an "identical" or "mirror reciprocity") to achieve effective competition and equitable trade. The U.S., with its much larger telcos, has always advocated the opposing view.

TECHNICAL STANDARDS AND THE INTERNATIONAL TELECOMMUNICATION UNION

The promise of an ubiquitous Information Highway is founded on the interconnection and interoperability of telecommunications systems and networks, which, in turn, are founded on agreed-upon international standards for some, but not all, technical aspects of these systems and networks. As it stands, not all telecommunications facilities and networks are ubiquitous. For instance, most national telephone networks are interconnected and interoperable, even a phone call originating on a touch-tone telephone, connected to a digital exchange in Canada, that goes by way of a manually-operated switchboard to a rotary-dial phone in rural China. The same is true of the Internet, and many national telephone systems around the world. Not all cable television systems are interoperable, however; the various multi-media

products and services are also not all interchangeable; and not all IBM and Apple computers are interconnectable.

Global telecommunications networks require international standards set in a forum that would ideally include all nations wishing to use a national Information Highway. These standards must be developed quickly, to reduce the likelihood that technology lock-in advantages and disadvantages for selective industry participants might arise in the interim. Standards must be clear and flexible so as to accommodate new information and developments.

Unfortunately, no one institution can carry out such a massive mandate, however. Even setting standards for the newer telecommunications equipment has proved too difficult for one institution. At present, a number of organizations are active in this area. The International Organization for Standards and the International Electrotechnical Commission are independent international industrial organizations recognized as advisory bodies by the UN for setting standards for computer networking. The Telecommunications Information and Networking Architecture consortium, the Digital Video Broadcasting Group and the Digital Audio Visual Council are all helping in setting standards for multi-media interfaces. The Motion Picture Experts Group ("MPEG") is developing standards for digital compression.

For more than a century since its inception, the ITU and its forerunner agencies performed adequately in setting standards for international telecommunications. For most of the twentieth century, however, this function had a low priority because technological change was proceeding at a very slow pace. When the ITU operated in an environment of national monopolies, where international services cross-subsidized local services, it addressed standard-setting issues only once every four years by issuing regulations that limited standards to the interfaces and boundaries between dedicated telecommunications equipment; often these voluntary regulations were adopted only when necessary and on the basis of the lowest common denominator acceptable to member states. In these circumstances, the ITU succeeded at being the world's pre-eminent international standard-setting institution in telecommunications, as is proven by the wide international adherence to its standards.

As the pace of innovation in telecommunications picked up in the past two decades, however, the ITU did not adapt quickly enough or sufficiently to meet the needs of some of its members, particularly those nations liberalizing their markets. The demand for new and improved standards rose precipitously; and it continues to do so today, as it will tomorrow.

The bureaucratic organization and broad political membership of the ITU proved to be a handicap, and the growing demand for standards was not met. Consequently, in the past decade, very competent Regional Standards Organizations ("RSOs"), such as the European Telecommunications Standards Institute ("ETSI"), the T1 Committee of the Exchange Carriers Standards Association ("T1") of the U.S. and the Telecommunications Technology Committee ("TTC") of Japan, have emerged to fill the traditional role of the ITU. The RSOs have several competitive advantages over the ITU in setting standards quickly and credibly, chiefly because they have a smaller and more homogeneous membership. They have further shown the capacity to agree on common standards by meeting and concluding agreements outside the ITU forum.

In its Plenipotentiary Conference of 1992, held in Kyoto, Japan, the ITU showed some notable signs of reform. ITU member states adopted a five-year strategic plan that established the priorities of the newly re-organized bureaus: Radiocommunication, Development and Standardization. This recognized the need to become more client-oriented; that the forces of rapid technological change are forging a truly over-arching global network; and that the operating environment has expanded to include the wider communications industry with its alliances of telecommunications companies intent on providing seamless competitive global services.

The ITU has re-organized its standardization process so that it now takes 18 months on average to produce a standard; in the last three years, the ITU has completed a workload roughly equivalent to that of the previous 20 years.(14) These developments suggest that the ITU can now respond to the forces of competition. Moreover, it appears that World Tel, a banking institution formed in 1995 under the auspices of the UN and with initial capital of US$50 million, will begin to invest on a commercial basis in order to develop modern telecommunications facilities in Third World countries. WorldTel, backed by many dominant developed country telcos, will require competitive telecommunications institutions in ITU member countries before making an investment; this should go a long way to alleviate the concerns of developing countries, which have so far placated the ITU in its efforts to provide timely standards-setting for the Information Highway. It seems, however, that the ITU's pre-eminence in standards-setting is lost forever.

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(14) Donald J. MacLean, "A New Departure for the ITU, An Inside View of the Kyoto Plenipotentiary Conference," *Telecommunications Policy*, Vol. 19, No. 3, 1995, p. 186.

The RSOs will always be faster at setting standards, because they serve fewer and narrower interests. These interests can also be viewed as an Achilles heel, however, since competition within and between RSOs may take precedence if the participants in an RSO believe they can gain an individual advantage by not cooperating; this can happen even though all participants would collectively gain more by adopting a common standard. Only an institution like the ITU can overcome this situation. Despite its chequered past, the ITU should be able to work its way back to centre stage in standards-setting by strategically finding a distinct niche, based on its leadership and reputation for eliciting cooperation from RSOs.

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