European Telecoms:
A Market Assessment

Bruce L. Egan

This report was prepared for the Office of Technology Assessment
United States Congress

Columbia Institute for Tele-Information
Graduate School of Business
809 Uris Hall
Columbia University
New York, New York 10027
(212) 854-4222

Table of Contents

EUROPEAN TELECOMS: A Market Assessment

SECOND DRAFT - FOR COMMENT ONLY, DO NOT QUOTE, CITE, OR DISTRIBUTE

European Telecoms: A Market Assessment

January, 1993

Bruce L. Egan

abstract

This article is essentially an assessment of the European marketplace for telecommunication services, current and prospective.[1] The goal is to highlight business opportunities and roadblocks facing U.S. firms.

1.0 European telecoms in perspective: the big picture

At first glance, the European market for telecommunication services looks like a hodge podge of regulatory and institutional restrictions sprinkled with niche business opportunities. Indeed, the only rational way for an American business to size up the odds of successful market entry depends critically on local conditions

---

[1]The European market(s), broadly defined includes: the 12 countries of the European Community (EC) - Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, United Kingdom; the 6 member states of the European Free Trade Association (EFTA) - Austria, Finland, Iceland, Norway, Sweden, Switzerland - which, combined with the EC constitute the European Economic Area (EEA) for purposes of application of the various directives of the Commission of the European Community (CEC) in Brussels; and the countries of Central and Eastern Europe including Russia.

in any one country, regardless of plans to pursue a Pan-European market strategy. To date, successful market entry by U.S. firms has generally required partnering, usually through a minority financial interest, with the all powerful incumbent monopoly Telecom Operator (TO).[2]

Government controlled TOs have a long history of nationalist and protectionist behavior.[3] This observation squares with the conventional wisdom that the European market for telecommunication products and services is largely closed to entry by non-European firms.[4] The public policy temptation for U.S. lawmakers to address the seemingly asymmetric market entry conditions in Europe is to retaliate by increasing U.S. entry barriers or at least slow down market liberalization policies for European entry.[5] However, a

---

[2] Historically, TOs were referred to as Post Telegraph and Telephone administrations (PTTs); newer terms include Telecom Authority (TA) and Public Telecommunications Organization (PTO), the members of which constitute the Conference of European Postal and Telecommunications authority (CEPT), the European public telecoms policy making body.

[3] Noam (1992) is a good source reference for history and recent trends of TO behavior.

[4] This position is clear from the preface by the president of the U.S. industry trade organization North American Telecommunications Association (NATA) in its 1990 report on European Telecoms.

[5] In the current Uruguay Round of the General Agreement on Tariffs and Trade (GATT), the U.S., through the office of the U.S. Trade Representative (USTR), wants to include telecom services in negotiations. This has proven to be very difficult due to a host of other issues, especially the favoritism that CEPT and the CEC continue to show for domestic telecom equipment suppliers. The apparent standoff in the area of TO procurement of equipment is

careful prospective analysis of the overall situation would caution against such policy prescriptions.

Given the novelty and uncertainty of the dynamics of market liberalization and the attendant political and institutional pressure to favor domestic firms in many EC member countries it is not surprising that U.S. firms face entry barriers. While there can be no doubt that U.S. telecom product and service markets are much more open to entry by foreign firms than are European markets, this is not how the Europeans see it.[6] Regardless of who is right, the empirical fact remains that U.S. firms' business activities and investments in Europe remain far greater than the combined activities and investments of European firms in U.S. markets.[7] Furthermore the annual U.S. trade surplus in telecom products and services remains healthy at almost $1 billion.[8]

A reliable comparative quantitative assessment of U.S. and European business activity is very difficult because of the typical problem

---

almost sure to derail progress on negotiations for trade in telecom services regardless of progress made on services as a stand alone issue. See the discussion in Noam (1992), Aronson and Cowhey (1987), and Cowhey and Aronson (1992) and the references therein.

[6] For a recent summary of the position of the CEC regarding U.S. trade restrictions in telecom products and services faced by EC firms see, CEC (1992e).

[7] Appendix 1 provides identifies European telecom business activity in the U.S. market and similarly for U.S. business in the European market.

[8] Source: NATA and U.S. International Trade Commission (USITC).

of identifying who "them" and "us" are. In other words, it is very difficult to classify a business as U.S. or European due to the existence of offshore operations, joint ownership arrangements, and the like; in this respect, trade and financial statistics can be misleading. From the standpoint of economic welfare what really counts is: where do profits end up?, and what is the impact among countries on the distribution of jobs and income? On this score at least, better volume of business measures need to be developed which can be translated into net U.S. jobs and income. As might be expected, offshore operations financed by foreign direct investment often employs mostly foreign nationals, but profit repatriation also occurs, stimulating domestic employment and income. Just how these two effects net out is not possible to determine given the available data.

If one had to guess at net impacts, it is certainly likely that, given existing trade frictions and the difficulty of physically exporting "services," direct foreign investment stimulates the domestic economy by increasing growth prospects, and, in turn, the overall value of the domestic corporate enterprise.[9]

---

[9] This conclusion assumes that the domestic market investment opportunities are not restricted and therefore the best investment alternatives are offshore. Current U.S. domestic policy is itself restrictive for many large U.S. telecom firms, and this may also be a reason for preferring direct foreign investments over domestic ones. There are many domestic business restrictions which limit the domestic investment opportunities between various telecom industry players, like telephone, cable, broadcasting, and publishing firms. For example, much of the foreign direct investment of Bell Telephone Companies may be the result of business restrictions

Domestic firms often find it is convenient and better for business to simply open a foreign based subsidiary, or become an equity partner with an existing foreign supplier rather than try to go it alone in the export market. Worldwide, U.S. telecom firms have invested billions more in foreign telecom markets than foreign telecom firms have invested here. This is especially so in the case of the telecom services business, where it is simply not feasible to have a market presence by exporting.[10] Presumably the direct investments of U.S. firms are or will become profitable ventures, yet, this level of business activity would not show up in trade statistics. This certainly has been the case with U.S. telecom firms that compete in Europe.[11] The massive U.S. telephone company investments in U.K. cable and telephone service markets are cases in point.

---

imposed on them by Federal lawmakers and the Judiciary. This would likely result in a net loss of domestic jobs and income if in fact the same investments would have been made domestically.

[10] Unless of course one is in the business of transporting international network traffic. But this is not the typical case of trade involving imports and exports. U.S. telecom services trade deficits are more a figment of traffic demand patterns and international accounting and revenue settlement practices between originating and terminating long distance telephone companies than they are actual net losses in U.S. jobs and income. Nevertheless, the reciprocity and parity issues of international toll call settlement payments remains a contentious one in its own right regardless of its implications for trade imbalances. See for example the discussion of long distance accounting rates in CEC (1992b). For a more detailed discussion and analysis see Frieden (1992) and the references therein.

[11] In fact, the USITC estimates U.S. direct investment in EC telecom product and service related ventures to be 10-15 times the annual value of exports. See: USITC (March 1990), USITC (April 1992).

To assess the potential competitiveness of U.S. firms in Europe requires that one put the target market in proper perspective. For a host of political and institutional reasons, the European telecommunication monopolies cannot be made competitive overnight. However, just as sure as the current European market for switched voice and data services appears closed to foreign competition, it is equally sure that over the long term it will become wide open, at least for lucrative market segments like business services. As in most of the rest of the developed world, European countries subsidize residential basic service subscribers with long distance and business revenues and therefore the mass market is effectively eliminated from the list of potentially attractive business opportunities for U.S. firms. Even in the most liberalized markets in the world, like Sweden, Britain, the U.S. and Japan, there is no significant competitive entry in the market for basic residential subscriber connections.[12] This situation will continue for at least the next decade, and more likely the next two decades, due to the slow market penetration of new technical alternatives to basic telephone service such as two-way cable television, and private digital radio. Thus the competitiveness issue for U.S. firms concerns business services and Value Added Services (VAS), broadly defined, including enhanced services, information services, and any

[12] Some industry observers see cable networks as a credible near term threat, but it is more likely that all cable really wants is the market for enhanced services. In the longer term, wireless technology may be able to compete effectively with the TO monopoly on basic telecom services.

other "non-basic" services.

Privatization of the public monopoly and establishment of a fully separate regulatory authority usually must precede meaningful competition.[13] In many European countries one or the other of these has not yet occurred.[14] As long as the government itself has a strong financial interest in the TO, especially when it cross subsidizes other public sectors such as posts and transportation, it cannot be expected to allow free competition from private domestic firms, let alone foreign ones. Except for the U.K., European countries generally lag the U.S. in introducing effective competition by at least 5 years. It is not realistic to expect the institutional or political environment to be so flexible that it would accommodate competition for foreign firms on a level playing field for some time to come.

The current European market is in a very fluid state of transition making short term market assessment a risky proposition. Fortunately, this is not the case with the market outlook for the long term which will be determined by some very powerful underlying market factors and trends beyond the control of any one country's political and institutional establishment, at least for those

---

[13] The CEC (1987) "Green Paper," and subsequent directives stress the need for full separation of the regulatory function.

[14] For a recent summary of the status of the TO monopolies, both in terms of ownership and regulatory authority see OECD (1992), p. 11-15.

countries in a position to be a powerful player in the global marketplace. Major underlying factors and their prospective market influence will be examined later in more detail including:

· the inevitable globalization of telecom service markets and the new market structures which this implies;

· technological alternatives to TO network services, especially for large businesses, making existing pricing structures and cross subsidies unsustainable in the decade of the 1990s;

· liberalization policies of the Commission of the European Communities (CEC) -- soon to undermine the effective monopolies of the powerful TOs.

These underlying forces already are beginning to have a significant impact on new service markets but will take years to be noticeable in the traditional monopoly area of switched voice and data telecommunications.

Beyond these factors there are three overarching trends operating on the demand side of the market equation which undeniably impact market conditions in the long term. So important are these to successful business strategies, they may be characterized as

telecommunication *mega*trends:[15] (1) proliferation of private networks, (2) portability of communications, (3) multimedia services demand.

Advances in digital network technologies enable these three demand-side influences to dominate the future direction of telecommunication markets. The impact of the first two, private networks and portability, is already quite noticeable, while the third, multimedia demand, is only a nascent development; more than the others, multimedia demand critically depends on advances in high speed network digitization and digital signal processing.

proliferation of private networks

This megatrend is caused by institutional, political, and market factors, including technological progress. Each represents a significant potential impact on the growth of private networks which pose a serious threat to the potential revenue base of the TOs. The U.S. experience is a case in point. Since the opportunity arrived in the early 1980s for consumers and competitive service suppliers to begin to use less expensive non-public switched network (PSN) facilities[16] to obtain traditional voice and data

---

[15] There are actually four, if one considers the paradigm shift caused by new high speed digital fiber optic technology, but the effect of this one may be captured in demand for integrated multimedia services.

[16] The term "non-switched" means services provided over "dedicated" (to a subscriber(s)) network facilities, e.g. private or leased lines.

services, less than half of the total market for usage of long distance access services today is purchased under the (per minute) switched tariff rates of telephone companies.[17]

In the U.S., the substitution of traffic from usage sensitive switched tariff rates to the lower flat rate monthly tariff rate for non-switched service is commonly referred to as "bypass." This phenomenon is a result of market forces, especially deregulation of market entry, resale, and sharing of dedicated access arrangements. Based on the available data and trends in liberalization of private networks and leased lines, it is now certain that the same bypass phenomenon which cost U.S. telephone companies billions of dollars in lost contribution to internal cross subsidies will also occur in Europe.

---

[17] Long distance "access" services are the interconnection arrangements between local and long distance telephone companies. Before the AT&T divestiture agreement in 1982, much of the toll usage (80%) in the US was billed on a per minute of use basis. Today, new dedicated subscriber connections, including the intensive use of software driven digital network technology for "virtual" networks and privately owned local networks, have changed the situation dramatically. Over half of toll usage has shifted to these new types of dedicated connections which are billed at flat rate monthly charges, not under the traditional switched toll tariff rates of local telephone companies. In the case of very large business users, like those in financial and insurance sectors, the typical firm has over 90% of its traffic carried over non-switched access lines. According to the International Communications Association (ICA), a large user trade organization, firms in the financial services sector are far and away the most intensive users of telecom service, comprising nearly a tenth of total operating expenses; this is almost twice as high as the second most intensive user segment, banking, which is twice as high as the next category, transportation.

As telephone network penetration rises to a high level, Universal Service objectives, fostered by regulatory policies of broadly averaged subscriber rates and built-in cross subsidies among subscriber groups, naturally take a back seat to the private interests of individuals and firms (or some coalitions of them). Having the low-valued marginal subscriber(s) hooked up to the public network is simply less important than pursuing one's self interests through more attractive private network arrangements. Once telephone service is universally available, the private benefits from breaking off of the system are much greater for many subscribers than are the perceived benefits of cost sharing with the general body of telephone subscribers. Once open interconnection is allowed, the process of private network coalition formation accelerates; we can expect future liberalized interconnection policies to strengthen this trend.[18]

The CEC, through aggressive Open Network Provision (ONP) policies, is starting down the same slippery slope of private network competition as the U.S. did back in 1978,[19] albeit in a less direct

---

[18] Noam (1992), chapters 3 and 4, discusses the processes of evolution and devolution of the public network infrastructure.

[19] The year 1978 generally marks the beginning of the end of the U.S. telephone companies monopolies on switched network services, even though strictly private networks had been allowed for some time before that. This was the year that the U.S. Courts and the FCC, after years of litigation, formally recognized the legality of MCI's Execunet Service - essentially a "private line" service which was a nearly perfect substitute for regular switched long distance service, at least for large users. Ultimately this service became a viable substitute even for small users as the

way. New digital network technology, coupled with liberalized terminal equipment and mandatory public network interconnection for leased lines, makes the specific use of the public network application (e.g. voice, data, video) transparent to both the subscriber and the TO, and thus has the same effect as directly relaxing entry barriers for a wide range of services, even those that are technically reserved to the monopoly TO like switched voice and data services.[20]

Once the floodgates for competitive networks are opened in Europe, examples of substitution effects using novel network service arrangements to replace the use of the traditional TO networks will abound. The most important prospective market developments which will affect TOs are the great emphasis on the side of the business which is peripheral to the core network, including network software, customer premises equipment (CPE), and information "content," and the de-emphasis of the core network, or "conduit" side of the business. From the perspective of competitive service providers and their customers, future value-added and profitability derives primarily from the former (content), while the latter (conduit) is becoming more of a commodity. Without high entry barriers, prices for core network usage will gradually fall closer

---

private network capacity expanded to most U.S. cities.

[20] In its Services Directive of 1990, the CEC called for gradual liberalization of all telecom service markets except for switched voice and some data services which were specifically "reserved" for provision by the monopoly TOs. See: CEC (1992a).

to commodity costs. This fact is by now obvious, due to recent major technological developments:

1) Virtual Private Networks (VPNs) - the use of advanced software on physically switched networks to provide functionally "dedicated" (e.g. leased line) services;

2) the use of the public transportation and electric power infrastructures for telecommunications using new digital fiber optics and radio technology;[21]

3) the use of wireless technology and in-home electrical wiring for intra-building communication, effectively replacing the need for a telephone company's "inside wire";

4) the use of compact discs and magnetic tapes for data, information, and telecommunications, in a wide variety of consumer and business applications and activities;

5) the technical ability to provide two-way telecommunications on coaxial cable television, digital radio, and satellite networks.

portability of communication

This megatrend refers to the strong growth of portable telecommunications, including optical discs, magnetic tapes, and satellite and other radio services, like digital cellular and Personal Communication Services (PCS - also called "micro-

---

[21] Railroads, highways, and even waterways provide excellent access to public rights of way, and electric power grids provide poles, towers, and power. As one example, Sprint, the third largest U.S. long distance network has rights to install cable along British Waterways canals. See Financial Times, October 15, 1992, p. IV.

cellular"). These are far and away the highest growth mass markets for the next decade and are where the action is today. For Western European countries, the demand stems from convenience and accessibility. For Central and Eastern Europe, the demand is even greater as there are long waiting lists for basic telephone service and no significant penetration of the public landline network infrastructure to provide it. Wireless is a relatively quick and inexpensive way to satisfy pent up demand and even may be the technology of choice for fixed access lines in the long term.

People are increasingly mobile; technical advances in digital radio technology allow consumers to realize their desires to communicate with the ease and convenience of portability. Various other portable electronic media have become, and will continue to become, increasingly substitutable for traditional fixed network telecommunications. Much of the potential usage of fixed networks, especially for high capacity digital communications like video services, will be displaced by portable alternatives through some of the private network alternatives listed above. In the longer term, it is conceivable that, once digital fiber optics matures as a technology, the situation could reverse itself, and services obtained on portable and wireless media like CDs, VCRs, and broadcasting, could move back to the (now high capacity) optical wireline network.

multimedia demand

We are just beginning to use new digital technology to combine video, audio, text, and data, for multimedia telecommunications including interactivity between end users and the networks themselves. The service possibilities range from well known applications to new high tech uses such as full motion interactive video and "virtual reality."[22] These new network capabilities could fulfill a wide variety of everyday consumer activities such as "telecommuting" (working from home), distance learning, shopping from home, bill paying or other transaction services, home health care, entertainment, monitoring, recording, etc. For the long term, multimedia capability will be required for the successful network of the future.

1.1 U.S. competitiveness

U.S. competitiveness in the market for European telecom services is affected by both non-market and market factors; these should be considered separately before combining them into an overall business strategy. Non-market factors such as legal and institutional barriers to entry are mostly exogenous and therefore beyond the control of the firm.[23] Market factors, including technical expertise, reflect the ability of the firm to compete for business assuming entry is allowed by government authorities.

---

[22] "Virtual reality" refers to a multimedia environment where any number of situations may be simulated electronically, resulting in experience without physical reality.

[23] Lobbying to influence institutions and political processes remains a possibility.

Technical expertise and business savvy is generally considered relatively high in U.S. firms, so problems of global competitiveness usually are attributed to foreign barriers to entry. When one observes the wide range of advanced telecommunication network services available to American businesses and the relatively low prices compared to that available to similar firms in Europe there appears to be a huge market lead by U.S. firms. But this situation is a bit misleading. One good (glaring) example of service differences will make the point.

In America, like no where else in the world, a high capacity digital network capability called DS3, operating at 45 Megabits per second (Mb/s), is available on demand in major urban areas from both public and private network operators. In fact, the lower rate DS1 service operating at 1.5 Mb/s has been a staple of private networks for over a decade now. European countries on the other hand have barely begun to utilize DS1 circuits (operating at the European standard rate of 2.0 Mb/s) for private business networks. The European counterpart for DS3 service, due to differences in network transmission standards, is 34 (Mb/s). Both the European and U.S. DS3 services are fully standardized well known network technologies. Yet, interestingly, DS3 service is not available on demand in Europe, Japan, or elsewhere for that matter. Why? Does this mean that telecommunication service providers in other countries, public or private, are somehow technically inept relative to their U.S. counterparts? Of course not. The know how to

utilize these rather simple standardized services is widespread. The answer is simply that TOs have managed to erect and maintain barriers to entry, not just for U.S. firms but to their own domestic competitors. The motivation for domestic market barriers is not simply to squelch competition or restrict services to large customers, both of which would cast a dark shadow on the service commitments of the incumbent TO. The real motivation is to preserve the existing structure of tariffs and services and the huge cross subsidies they perpetuate. High capacity services like DS3 feature a very low unit cost for circuit equivalent capacity; its market introduction would naturally cut the profitability of the set of lower capacity TO services. Political and institutional inertia favors protection of existing revenue streams over large customer satisfaction and strong domestic competition; hence, no DS3 introduction.

In the U.S., public telephone network operators have no choice but to bypass themselves by offering high capacity, relatively low priced, DS3 services to existing business customers and competitive network providers. The only market alternative is to risk losing lucrative business accounts altogether. In Europe, where competition for large customers and network services is not a given, foreclosure is often perceived as a better option for the TO rather than bypassing itself and cutting profit margins on traditional tariffed services.

It is still popular in Europe to believe that inexpensive universal telephone service for the masses requires the protection of lucrative TO revenue streams from competition. But, based largely on the market liberalization experience in the U.S. and the U.K., this traditional view will soon change. It has to. Not just because local telephone companies in the U.S. and the U.K. continued to fare quite well after the introduction of competition in lucrative toll and business services markets, but because the globalization of telecom service markets will cause those firms in countries which severely restrict domestic competition to be disadvantaged in their efforts to become global players. As the Japanese have proven time and again in other industries, it is important to be able to develop a strong domestic market before leveraging that demand base in the international market. Indeed, an examination of participation of telecommunication firms in far flung international markets show U.S. and British firms at the top of the list. Offering the best customers the latest technology and service capabilities, like DS3, is the way to compete over the long haul.

The imperative to develop a strong domestic market first may explain a large part of the motivation for European countries to continue to promote policies favoring domestic firms as they transition to competition.[24] If gradual dismantling of domestic

[24] The importance of cultivating a strong domestic market is not lost on EC countries, and is a primary goal of unification initiatives like the pending Maastrict Treaty. EC market unification is designed to favor intra-EC telecom firms to develop

cross subsidy structures is to occur, EC government authorities no doubt would rather see it benefit domestic and intra-Community businesses more than foreign ones, even if it is at the expense of foreign retaliation and symmetrical trade policies in services sought by GATT or other bilateral trade negotiations. For now at least, the CEC does not seem willing to take on its member states on this issue. The latest CEC network equipment directive explicitly concedes on national policies favoring domestic suppliers.[25] More recently, explicit CEC support for favoring domestic firms in conjunction with EC market unification efforts was re-emphasized in the Eurostrategies Report released in July, 1992 (CEC 1992e).

At the same time however, CEC directives regarding telecom services are quite a different story. While on the surface it appears that the CEC has conceded to member state pressure to favor the TO regarding voice and data services utilizing the public switched network, careful examination shows that this is not necessarily the case. In the first place, the Services Directive, which specifically reserves switched voice services to the TO, is to be reviewed in 1993 with an eye toward further market liberalization.

---

and support a world class market base to leverage in the international market place. See the discussion in CEC (1992a), p. 33-41 and the similar rationale provided in CEC (1992e), p. 32, regarding the telecom equipment market.

[25] For a review of the equipment directive from both the EC and the U.S. perspectives see CEC (1992e), p. 22, and USITC (October 1991) 4-22.

Secondly, this same directive calls for liberalizing leased lines and VAS, both very high growth markets. Furthermore, the effect of the latest (June 1992) CEC Open Network Provision (ONP) directive for leased line services, combined with new digital network technology, provides a back door for business customers and competitive network suppliers to effectively skirt much of the effects of the Services Directive treatment of monopoly services reserved to the TOs. The leased line ONP directive mandates non-discriminatory interconnection for leased lines by 1993 and eliminates TO restrictions on the use of leased line connections, even for voice services. Finally, the CEC has already announced its intentions to implement ONP directives for voice and wireless services to become effective in 1993 and beyond; this will further weaken the effects of the initial Services Directive. Indeed, the International Chamber of Commerce (ICC), an outspoken proponent of market liberalization, has already prepared a document describing how large businesses can take advantage of the CEC ONP directive on leased lines to effectively substitute this less expensive alternative for current voice telephony.[26]

In summary, it appears that Europe is heading rapidly down the slippery slope of "accidental" competition just as the U.S. did in the 1970s. The difference is that the slope is even more slippery

---

[26] The CEC leased lines ONP directive states that ultimate use or application of traffic on dedicated lines may not be restricted, whether for data, voice or otherwise (ICC 1992).

now that experience in bypass techniques and technologies has progressed substantially since the U.S. experience. The parallels between the U.S. and Europe are clear. What appears to be a relatively harmless regulatory approval of private line competition, in fact is the beginning of the end for the voice telephony monopoly.[27] It is doubtful that the clock may be turned back since the CEC has successfully defended its decisions in the European Justice Court before by invoking the provisions of the Treaty of Rome on member country abuse of monopoly power.[28] The story is not over however, as EC member states still have appeals pending to overturn CEC directives on telecom equipment and services.[29]

---

[27] Temin (1987) discusses the origins of the popular belief that the approval of MCI's Execunet service was only impacting private line service, not the voice services monopoly.

[28] In the famous BT case regarding private Telex Bureau provision of intra-community transmissions, the CEC found BT's rules anti-competitive under Article 86 of the Treaty of Rome (*Official Journal*, L360, 1982, p.36). After years of litigation pursuant to the CEC 1982 decision, the European Court of Justice ultimately upheld the CEC in March 1985. For a brief history of the case see Noam (1992) p.121-123. Since then, the CEC often invoked Article 90 of the Treaty of Rome to bypass the authority of member state TOs and the EC Council of Ministers. In 1988, several member states challenged the CEC authority under Article 90 before the high court and were unsuccessful. Article 90 was also invoked by the CEC in it's landmark terminal equipment directive of 1988, which, in one fell swoop, stripped CEPT of its power to set terminal equipment standards.

[29] For a good summary of the disputes between the CEC and the various member states, see the recent article in the Financial Times, Thursday, October 15, 1992, Section III, p. II.

There are those who will claim that the cultural and institutional differences between Europe and the U.S. invalidate any such comparisons with the U.S. experience. They are wrong. In today's global economy, business incentives and market forces are homogeneous and will prevail over parochial interests of any one country. The political transition of Eastern Europe and the CIS is one great example of the powerful market forces at work in the global economy. The only way that a country can continue domestic policies over the long term which are not consistent with market liberalization is by foregoing being a serious international player. While it remains an open question as to the relative economic gains any given country may achieve through adoption of (the correct) strategic industrial policies, adoption of protectionist policies simply for the sake of protecting domestic firms from competition will harm jobs and income growth over the long term. It does not appear that the motivation for EC member states' protectionist policies in telecoms derives from some grand plan for strategic industrial policy; on the other hand, nor do they seem to derive from simple knee-jerk reactions to threats to state sovereinty. Most likely, protectionist telecom polices derive from regulatory inertia and the bilateral comfort and certainty it provides the government bureaucrats and the TOs - together they are the supply and demand for regulation.

Close examination of U.S. telecom markets show that, protected or unprotected, basic local telephone service for residential

subscribers is still an effective monopoly, just like the TO's local service in Europe. It's just that in Europe the monopoly is mandated by government, or owned by it, or both. The difference is largely superficial. Local telephone companies in America, while nominally (legally) subject to competition, are still fully regulated and controlled by state regulators who often remain very protective of their charges as revealed by the very low levels of competition for traditional services in the mass market. But, in the case of competition for business services and VAS, the U.S. and major European countries will soon look very much alike in terms of market structure and business operations. In these markets the TOs are rapidly losing market share as did U.S. telephone companies before them.

This leaves domestic and international long distance as the only substantial difference between the market situation in the U.S. and Europe. In the case of international long distance, the European monopolies are fast crumbling due in no small part to the desires of the CEC to bring down barriers to competition in intra-EC traffic, and similar pressure from the U.S. Government, GATT, and the U.N., on EC international traffic to the rest of the world.[30]

---

[30] Not to mention the rash of entrepreneurs skirting the current competition prohibitions by such creative techniques as "code calling" and automatic call-back schemes designed to arbitrage asymmetrical U.S./foreign country tariff rates on originating traffic. In a recent short (but good) article, *The Economist* (1992a) calls these entreprenuers "privateers." Even traditional large international carriers, like AT&T and MCI are getting into the act.

Once again the European competition policy leader, the U.K., has already liberalized the international long distance market by authorizing entry to any country willing to agree to bilateral symmetry in rules for pricing and service competition. European countries that are not willing to pursue similar bilateral competitive arrangements will be left behind in the global market for long distance service.

This leaves only domestic long distance as truly problematical for European market liberalization. This situation is compounded by the fact that once profits and subsidies flowing to the TO from large businesses and international long distance begin to shrink due to competition, the only remaining source of supranormal (monopoly) profits will be domestic long distance services. Interestingly, this is also the case in the U.S. where intraLATA long distance service is still dominated by the local telephone company and is a substantial source of profit and cross subsidy.[31] In Europe, as in the U.S., this market will be the last to be liberalized (basic

---

[31] The term LATA is a U.S. Local Access and Transport Area. This is an artificial geopraphic boundary area, generally wholly within the political boundaries of a state. Depending on the size of a state, there are any number of possibilities for the number of LATAs including only one in the case of small states. The sole purpose of the LATA designation is to denote that area within which the Bell Operating Company (BOC) as the Local Exchange Carrier (LEC) is legally permitted to provide end-to-end toll calling service at tariffed rates. According to the AT&T Divestiture Court rules, BOCs are not permitted to provide interLATA toll service, but rather are permitted to provide that portion of the end-to-end connection represented by local exchange access services on behalf of interLATA toll carriers.

local service notwithstanding). Due to bypass techniques using leased lines or private networks, U.S. local telephone companies have already lost over a fourth of the market for intraLATA long distance service even though in most states direct competition is not specifically sanctioned by state regulators. The same trend will begin to occur in Europe, even though, technically, this service is reserved to the TO. As CEC pressure continues to reduce intra-EC toll service tariffs, intra-country tariffs must follow suit or companies will simple choose to route traffic via a neighboring country to take advantage of tariff differentials, or go the leased line route already mentioned. This is exactly how large toll users in the U.S. reacted whenever the intraLATA toll service tariffs were substantially higher than for interLATA. The TO has little hope of policing this situation even for voice traffic, especially in an all digital network environment. Indeed, the leased line ONP directive states that the TO is prohibited from monitoring the use of dedicated access arrangements to carry voice traffic of any kind.

In conclusion, there appears to be no where for European TOs to hide from the market forces of competition. It is safe to assume that competition in all non-basic service markets for telecom services in Europe, including voice toll services, will be effective in all lucrative market segments before the end of this decade, not necessarily because open entry was explicitly allowed, but because of the back door approaches taken by the CEC in

creating loopholes in the seemingly impregnable TO voice services monopoly.

Thus, the real issue for U.S. firms is *when* will they have access to these various markets on an equal footing with EC firms, not *if*. The answer, unfortunately, is probably not in this decade. This calls for a continuance of the strategy of partnering with major EC firms to gain a market foothold. One primary reason U.S. firms need help from EC incumbents is that non-discriminatory interconnection mandated by the CEC in their various ONP rulings is not the same as *equal* access in the sense ordered by the U.S. District Court Judge in the AT&T Divestiture case. The Judge essentially ordered a rapid (expensive) transition to physically and functionally equal access for all competitors such that it would be transparent to the typical end user, even concerning the number of digits one must dial. Europe's policies of liberalization, including the most progressive ones of the CEC, still do not constitute equal ease and convenience of access for all. Thus, until such issues as dialing parity, pre-subscription, and control of telephone numbers, are addressed head-on by European regulators, the mass market for voice toll service will be extremely difficult for U.S. firms to penetrate. Nevertheless, the lucrative business markets will still be wide open because it is possible to cost effectively overcome issues such as dialing parity through advanced telecom systems and equipment.

1.2 EC market unification

Questions often arise as to the impact of the pending EC market unification initiative, the Maastrict Treaty, on the competitiveness of U.S. firms in European markets.[32] The answer is that it will not have that much effect at first, but, on balance, it will ultimately enhance the competitiveness of intra-EC firms relative to foreign suppliers of telecom products and services both in European and non-European markets. Thus, EC market integration may be viewed as a game which is Europe's to lose, not for foreigners to win. The current CEC unification initiative embodied in the pending Maastrict Treaty is currently being voted on in some member countries. Recently, Denmark voters rejected Maastrict, and it barely survived a French referendum. Britain is set to vote next and it may be close. In many EC countries, the TO is revered as a symbol of financial strength and reliability, and therefore attacks on the TO monopoly from Brussels would hurt Maastricht's chances in a referendum. In the recent French vote, it could easily have made the difference as France Telecom is a pillar of business strength. So for now at least, Brussels has to lay low on implementing competition policies or risk derailing progress on EC unification which is, needless to say, their paramount concern. Some evidence of softening of CEC competition policy in telecoms is an October 21 report reviewing the telecom services sector. It was to be another step toward market liberalization of the 90% still reserved to the

---

[32] For a brief summary of the major provisions of the Maastricht Treaty, see The Economist 1992b.

TOs. Instead it was more of a competition policy retreat.[33]

What is gained by EC market unification? Certainly a lot if you are a European firm. For one thing free trade among EC countries will result. Business laws and technical standards will become more uniform, and an important financial least common denominator will be born - the ecu. The EC ecu has been in existence for some time now and currently trades at about 1.4 U.S. dollars. However, its use as a stable common currency depends on a member state's approval of a solid unification treaty like Maastrict.

Just based on raw numbers for total population and income, European market unification/integration will create the world's largest single regional consumer market for goods and services. For this reason unification is seen as an unprecedented business opportunity for international players. Of course it is an even bigger opportunity for intra-EC firms because the rules for unification and free trade applies only to EC member states, not to the world community at large, which is still under the purview of international organizations such as the U.N. and GATT. Thus, U.S. firms must view unification as more of a challenge than an opportunity as it will strengthen the world standing of European firms.

---

[33] See The Economist 1992d.

It turns out that not only is the current partnering strategies of U.S. firms in niche telecom markets in Europe successful for breaking into an otherwise closed market area, but it is also the right strategy for positioning for the future unified EC market. The reason is that once a European presence is accomplished by U.S. firms, they too will benefit from unification since they now are technically European firms. The giant telecom firms of Europe's member states are certainly poised to pounce as soon as market unification becomes a reality, and U.S. based firms will be at a relative disadvantage at that point. In fact, such strong European players could emerge as to lend a credible threat to U.S. firms' grip on North American markets. The other losers from market unification, in a relative sense, will be those firms in weaker member states which are not in a position to become major players. Interestingly, this may partly explain why some of the smaller but potentially important EC member states TOs, like STET (Italy), and Telefonica (Spain), have recently been partnering with some very large U.S. players. In these cases, it may be important to take on a U.S. partner to play with industry giants like BT, France Telecom, and Deutsche Bundespost Telekom.

To address concerns of relatively small or otherwise disadvantaged member states and the public TOs, it is very unlikely that EC unification will substantially affect the sovereignty of member state governments to retain some discretion in their decisions concerning equipment procurement practices, and, to a greater

extent, decisions concerning services provision. Consistent with CEC directives to date, one cannot expect approval of Maastrict or other future unification initiative to have much short term impact on TO market dominance for reserved services. This is a non-trivial point worth reiterating. If U.S. firms are under the impression that somehow EC unification under Maastrict helps solve the problem of EC market barriers to entry through CEC preemption of market power of member state TOs, they should think again. Maastrict would likely not have such an effect and therefore again would represent more of a challenge to U.S. firms, not a panacea for overcoming the political power of member state TOs.

This having been said, there are some good longer term market prospects for U.S. firms arising out of EC unification. There is no doubt that the CEC competition initiatives have been a boon to U.S. business activity in Europe relative to those which may have occurred through CEPT or the member states themselves. So far, the CEC has withstood some strong challenges from member states and their TOs, all the way to the European Justice Court. To the extent that Maastrict or other unification initiative serves to hasten the formation of a powerful CEC regulatory body for telecoms, this new body would likely be much more liberal concerning foreign competition policy than the current CEC, which, when challenged, must rely on the sometimes ambiguous provisions of the Treaty of

Rome for its defense.[34] It is always unclear as to whether new or pending CEC competition directives will survive litigation. A more powerful and autonomous CEC with its own charter to regulate member states would be a welcome change by reducing uncertainty concerning liberalization initiatives.

There is another disturbing future possibility for U.S. firms. If the CEC does eventually obtain the requisite authority to create and implement an all powerful regulatory authority for Europe, there remains the possibility that the new authority would mandate trade policies that would strenthen "Fortress Europe."[35]

Should Maastrict be approved, an appropriate strategy for U.S. telecom firms would be to lobby the U.S. Trade Representative to demand parity in the terms of trade between firms in U.S. and

---

[34] Key provisions of the EC treaty of Rome which have been invoked from time to time against member states by the CEC include: Article 37, which prohibits discrimination in procurement and marketing of goods and services by state monopolies; Article 59, which promotes abolition of restrictions on services provision; Articles 85 and 86, which prohibit abuse of dominant position or anti-competitive behavior; and Article 90, which applies the Community competition rules as laid out in Articles 85 and 86 to all public undertakings granted special or exclusive rights. The Treaty of Rome supplied the CEC the basis upon which the pro-competitive provisions of the 1987 "Green Paper," were to be implemented.

[35] In a recent paper Noam (September 1992) discusses the disturbing possibility of a power play by Brussels. For now the CEC appears to be attacking at the periphery of TO monopolies, however once it is successful, the CEC may choose to implement its own centralized protectionist policies.

European telecom markets before access to the U.S. market would be granted to the powerhouses of Europe. A guidepost for the terms of trade could be the same rules which apply for trade between member states of the North American Free Trade Area (NAFTA) and those states within the EC market area. In the absence of EC unification, the appropriate strategy of U.S. firms would be to continue to support CEC inititives to undermine the TO monopolies.

1.3 format of the paper

The remainder of the paper will present a more detailed discussion of U.S competitiveness in European telecom services markets. Section 2 provides empirical data and positive analysis of the size and structure of the European marketplace. Section 3 looks at critical market factors and trends. Section 4 discusses business strategies and finally Section 5 summarizes policy conclusions and presents policy recommendations.

2.0 size and structure of the market[36]

The EC, made up of over 360 million consumers is the worlds largest homogeneous consumer market. The total market for European telecoms

---

[36] Due to data constraints, all market size estimates are for the 12 member states of the EC unless otherwise noted. All market growth estimates are based on recent years (usually after 1988) and are the author's assessment of the consensus view. Sources surveyed for market size/growth estimates used in this section include: McGraw Hill and subsidiaries Northern Business Information and Datapro, Dataquest, Communications and Information Technology Research (CIT), Intelidata, Logica, Input, CEC, OECD, NATA, OMSYC (French), Frost and Sullivan, Gartner Group, Link, Yankee Group.

is estimated at $150B (1991) of which about 70% or $120B is for telecom services, broadly defined to include all point-to-point (non-broadcast) services, both basic and non-basic or value-added services.[37] Overall market growth for EC telecoms for the early 1990s is forecasted to be about 5-6% per year; this includes about 6-7% per year growth for services and somewhat less for equipment.[38] This is similar to growth rates for U.S. telephone company service revenues, which are not growing nearly as fast as private network service providers. Inflation in recent years in the EC is somewhat greater than that for the U.S. and therefore real growth in the U.S. would be slightly higher.

The EC countries represent the vast majority of the Greater European telecom market; within the EC itself only four countries comprise over 80% of the total market (Germany, U.K., France, Italy).

According to a recent CEC report on telecommunication tariffs in the Community, growth in TO revenues from 1980-1990 averaged 4% per year in real terms or almost 10% in nominal terms, while market

---

[37] Source: CEC (1992e). While the market for broadcasting and programming services are arguably within the broad definition of telecom services, most official telecom trade discussions omit them. Most telecom data sources also exclude broadcasting for purposes of analysis.

[38] Sources surveyed differed substantially in the case of equipment market growth forecasts, from 3% to 10% annually; most were in the low end of the range however. Service growth forecasts differed less from 5-9%.

penetration of access lines relative to population grew about 5% per year.[39] These estimates of the growth of EC telecoms, both in terms of access lines and revenues, are higher than in the U.S., where access line penetration is flat and line growth is 2-3% per year, while (nominal) revenue growth is about 7% per year. Total EC traffic growth for the public switched network (PSN) is about 6% per year. Toll call revenues are growing somewhat faster and international toll calls are the highest growth PSN segment at 14% annually. Businesses account for 26% of total access lines and 45% of total TO revenues.

In terms of market structure there is generally only one dominant TO per EC country which retains a voice services monopoly. The exception for voice toll services is the U.K. owing to its liberalized entry policies.[40] In some cases there are more than one TO depending on the region of the country, but there is still only one dominant operating authority. For example, the U.K. has Hull Telephone Department as the monopoly in its (small) service area. Denmark, Finland, and others feature a dominant government telecom authority, but have several regional monopoly TOs. Except for the

---

[39] Source: CEC 1992(b), p. 8. The CEC annual growth estimates are a broad average for the period 1980-1990. This explains some of the differences with the other market growth estimates presented which represent averages for a shorter, more recent time period.

[40] BT is even beginning to lose its monopoly in local voice services due to liberalized entry conditions, especially for cable television companies providing two-way telephone service. Most of these advanced cable networks are financed by U.S. telephone companies.

U.K., EC country TO's majority (or sole) owner is the central government, which is also the regulatory authority.[41]

In major EC member states' markets for non-voice services, the market structure tends to be oligopolistic. However, in practice, business behavior in these markets is best characterized as the "dominant firm" model. Generally, the operating divisions of the TO itself dominate major non-voice network service markets (e.g. private line data services) and therefore the other large players operate under the TO price umbrella as "price followers." Depending on the specific European country, there are any number of competitive regional and niche market service suppliers, including pure resellers and third party network management operations.

In the case of cellular telecommunications, which is just beginning to take off, the dominant market structure is duopoly, as is still the case in the U.S. In some EC countries the TO is the only cellular provider, especially for the initial analog network systems. However, as the market develops and as new radio frequency spectrum is allocated by the government to cellular service, the monopoly model is being abandoned toward oligopoly. This process has already begun in the U.K. which has some of the most liberal

---

[41] Noam (1992) surveys the history of TO ownership and control. For current data on TOs and private telecom firms including a summary of current ownership and control see the annual "catalog" report by CIT (1992).

entry policies in the world.

In Europe the process of introducing competition into the cellular market is being speeded up by the agreement on a new digital cellular standard called Global System for Mobile communications (GSM). Even though the U.S. has not adopted a compatible digital standard, U.S. cellular operators are aggressively pursuing European market opportunities brought about by the offering of multiple GSM licenses.

In Central and Eastern European countries, generalization as to market structure is more difficult due to the radical social and geo-political transition phases they are going through. However, it is possible to make some basic observations. First, for lack of infrastructure, foreign exchange reserves, and domestic or foreign investment funds, the Central and Eastern European countries generally will be retaining the monopoly model for switched voice, data, and even cellular network services. This does not mean however that the designated monopoly provider will be government owned. On the contrary, foreign ownership is likely, but under government control. The reason is that by guaranteeing a monopoly status for a number of years to private network investors/operators, it will be easier to attract capital for infrastructure investments. There may be a slight problem with such monopoly guarantees however. Some of the largest potential sources of funds of telecom infrastructure projects are the World Bank and

the International Finance Corporation, both of which tend to promote private sector control in a capitalistic market setting.[42]

The market structure for cellular systems throughout the Greater European market area provides insights into the various dispositions of government authorities to liberalize or strictly control market entry. Not only does cellular market data reveal government intentions, but it also reveals the ability of U.S. firms to participate in European cellular markets and their relative strategies and propensities to invest. Appendix 2 provides recent data on cellular investments and license conditions, including U.S. firm participation. Data on U.S. firms' current and future participation in European cellular service markets is better than that for other telecom service markets due to the public disclosure associated with the licensing requirements.

In the case of other partially regulated or competitive service markets, there are dozens of deals involving U.S. companies being made (or dissolved) at any moment. Except for major examples, reporting on these transactions are beyond the scope of the present exercise. Numerous private market research firms routinely track specific business activities of U.S. firms in European markets and many are listed in the bibliography.

---

[42] For a brief article on how such loans work see, "Telecom Ventures Development Funding: A Fresh Approach," Financial Times, October 15, 1992, Section III, p. II.

2.1 monopoly vs. non-monopoly sectors

Of the total market for telecom services, the portion represented by the TOs is over 90%, about $110B per year, with annual growth of 6-7%. The reserved voice services monopoly portion represents about 80-90% of total TO revenues and annual growth rates are slightly lower. In contrast, non-voice services growth, including TO supplied data lines is about 10% per year.

2.1.1 basic services

TO basic public network services, including local and toll services, is about $100B per year (1991) and annual growth is about 5%-6%. Of this amount, local service revenue is about one-third, domestic long distance one-third, and the balance is split almost equally between basic data services and international long distance.

Except for the U.K. the market structure for voice services is a monopoly. Even in the case of the U.K., BT has an effective monopoly for local and mass market switched long distance services. However, stiff competition is expected in markets for dedicated voice circuits, international long distance and, eventually, domestic long distance. In the other EC countries, the monopoly model for voice services, even toll services, remains in effect for the next several years, and, in most cases, far beyond.

2.1.2 leased line services

Except for the U.K. with its liberalization policies, the EC market for leased line services may be characterized as the "sleeper" among service offerings. Growth potential is phenomenal as technological improvements allow leased lines to become a viable substitute for switched services for a growing number of large customers. Currently, leased lines do not even represent 10% of the total market for telecom services in the EC, but they are fast becoming the preferred vehicle for bypassing TO switched tariff rates and for delivering VAS to end users. In fact, revenues from the fast growing data and VAS markets already constitute a higher portion of TO revenues than do the monthly lease payments collected for the leased lines themselves. The growth potential for leased line services is at least double that for traditional switched services for at least the next decade (e.g. 10-15% per year). It could be much higher than that if market liberalization and competition were allowed to occur. A recent survey by the OECD of leased line and private networks is particularly revealing on this point. In almost all European countries leased line interconnection to the PSN is very restrictive, leased line prices are relatively high compared to the U.S. and U.K., and private networks are nearly non-existent.[43]

The effect of imminent liberalization policies for leased line services can best be gauged by the recent U.K. experience; BT is

---

[43] See the report OECD (1992), p.79-87,

the only telco using leased line connections on the same terms and conditions as its network and service competitors. The U.K., which represents only about 16% of the total EC market, has well over half the leased lines in the entire EC and a whopping 90% of high capacity lines (2 Mb/s).[44] Similarly, in the U.S., growth in leased lines and other dedicated bypass circuits of competitive network providers far outstrips that of switched circuits.

The market structure for private network suppliers catering to large business subscribers will soon become oligopolistic in major EC countries due to the CEC ONP directive on leased lines. Beyond facilities-based leased line network service providers,[45] network services resale and other VAS will be a very dynamic competitive market with many niche suppliers trying to differentiate their various service applications through software or service innovation. Due to the relatively high switched tariff rates of incumbent TOs, reselling of switched TO services will be a very small market. The real profit opportunities will exist for resale of dedicated TO facilities which will continue to fall in price due to pressure for cost based leased line rates from the CEC and other competitive network providers.

---

[44] Source: International Institute of Communications (IIC) (1991).

[45] The term "facilities-based" means those providers that build and lease to others, or own and operate all or part of the network equipment used to provide services to end users.

The CEC ONP directive for leased lines adopted June 5, 1992 calls for EC member state TOs by 1993 to make available on a timely and non-discriminatory basis 5 categories of standardized tariffed leased line services: two types of analog voice, 64 Kb/s digital, and two types of 2 Mb/s digital. Upon implementing this directive the use of leased line services will take off similar to how it has already begun to do so in the U.K. As in the U.S., the next step will be for competition to force the TOs to offer a very high capacity DS3 leased line service.

Based on the U.S. experience, large businesses and competitive network suppliers will enjoy significant cost savings from a competitive market for high capacity circuits like DS3. When this occurs, bypass accelerates substantially. At the same time however, partly due to demand response to lower prices, and partly due to innovative service offerings, the total market expands and the bypass effects on telephone companies are mitigated to some extent.

2.1.3 Value Added Services (VAS)

There is no definitive market for VAS.[46] The term generally refers to "non-basic" telecom services which could be interpreted in any number of ways. It is perhaps easiest to define VAS in terms of what it is not - basic service. Basic services are defined as traditional switched services, such as regulated local and toll

---

[46] For a brief discussion of the difficulty in defining VAS see CIT Publications (1992), p.4-6.

voice services, and some leased line services. Data and information services which feature added value above and beyond the raw capacity and monthly charges for TO leased lines constitute a major portion of VAS. Charges for the use of privately provided data and voice networks, such as Local Area Networks (LANs), Metropolitan and Wide Area Networks (MANs/WANs), and the catch-all category Value Added Networks (VANs), all are considered part of the VAS market since they are often used as the delivery/distribution mechanism for services. In the market for private VANs, the U.K. is again the leader with an estimated 70-80% of the European market.[47] While in many EC countries the dominant VAS supplier is the TO itself, tariff charges for TO provided network delivery are excluded from VAS market estimates because the category generally is considered to be competitive (i.e. not tariffed). There is a very wide variety of "soft" VAS market segments, such as network management and consulting, software, network operations and systems support services, etc. There are numerous VAS service applications including: E-mail, facsimile, database services, cellular, paging, high capacity data, Electronic Data Interchange (EDI), transaction services (e.g. credit card verification, Automatic Teller Machines (ATMs), Computerized Reservation Services (CRSs), Electronic Funds Transfer (EFT), debit and point of sale network services), and networked Computer Aided Design/Manufacturing/Engineering (CAD,

[47] Source: Datapro (July 1990).

CAM, CAE) -- the list goes on.[48]

Due to the local (often end user specified) functionality requirements of most VAS, the market structure is competitive and full of niche suppliers. There are some major players however that span a multitude of service offerings and which have the capacity and broad geographical presence to serve very large corporate and public enterprises. Their market structure is oligopolistic as evidenced by the fact that the same basic players seem to bid on the largest VAS contract proposals.

Using a very broad definition of VAS, the USITC reports that in 1989 the EC VAS market was about $26B compared to about $50B for the U.S.[49] This estimate might seem high considering that many EC countries restrict VAS network providers, however the category is very broadly defined. A much more narrow market definition would exclude computer services and software, retaining the networking, information and delivery portion (VANs) of the VAS business, estimated to be about $5-6B for 1990.[50] Other VAS market estimates may include charges for private data nets, cellular, paging, and other mobile and satellite business services. Annual growth

---

[48] For a more complete listing of VAS applications and brief discussion see, CIT Publications (1992).

[49] USITC Third Follow-Up Report (March 1991).

[50] Datapro (1991), and CIT Research (1992), and USITC Fourth Follow-up Report (1992).

estimates for the overall EC VAS market are generally high, in the range of 20-30%.[51]

VAS market segments

Due to the large differences in the stage of the life cycle that various VAS market segments are in, and the variations in underlying growth rates, it is useful to look at some primary service applications individually.

cellular service

Except for the U.K. where BT serves less than half the cellular mobile services market, the TOs dominate the scene. Mobile cellular service markets in the EC generate an estimated $4.5B (1990) and serve over 3 million subscribers.[52] Growth is forecasted in the 20-30% range for the early 1990s. New service applications for wireless technology beyond traditional analog cellular systems are expanding rapidly including: wide area paging, private and trunked mobile radio, mobile data, GSM digital cellular, cordless, Personal Communication Services (PCS), and satellite mobile services. The potential for growth is truly enormous. The U.S. and U.K., with their relatively low prices and liberalization policies, have market penetration of about 20 mobile phones per 1000 population.

---

[51] USITC (1991), Northern Business Information (1990), CIT (1992).

[52] Source: CIT Research (1992), Northern Business Information (1989).

Germany and France have only 7 and 5 respectively. The Nordic countries, which adopted a standard technology long ago and have prices even lower than the U.S., achieved a remarkable penetration rate of about 50 phones per 1000 population. Many other countries do not even have mobile services, and the Eastern European countries and the CIS are just beginning. Thus the full range of cellular and wireless VAS markets will be one of the top growth prospects for the Greater European market area through the 1990s.[53]

network management systems/managed network services

This is a small but fast growing niche market. Growth rates are estimated at about 40% per year for the early 1990s.[54]

Electronic Data Interchange (EDI)

EDI is the machine to machine transfer of fixed format data like bank transfers. The rapidly growing EDI market in the U.S. is evidence that this nascent EC market is going to take off in the early 1990s. The U.K. currently dominates the EC market, about $65M in 1990, out of an estimated total $110M for the EC. Out of over 6 million EC companies, only about 7,500 use EDI. Potential EDI service applications abound and the growth potential is enormous. Data services liberalization along with public network

---

[53] Source: OECD (1992).

[54] For a brief discussion of this market and a list of players, see CIT (1992).

interconnection will allow this market to grow at rates of 50% or more in the very early years of service introduction.

other VAS

Networked data, facsimile, e-mail, and on-line database services are all expected to grow at about the average for the total VAS category or about 20% per year.

2.1.4 satellite services

The market for satellite telecommunications in Europe has been historically small, but two related technological develoments will give birth to a new large market. The first is the use of high powered satellites and Very Small Aperture Terminal (VSAT) to send and receive point-to-point data transmissions quickly and inexpensively. Where good wireline network infrastructures do not exist, like portions of Central and Eastern Europe, the advantage of VSAT systems is clear.

Second is the use of high powered Direct Broadcast Satellites capable of providing a very large number of television channels, including new high definition television, to small inexpensive subscriber receiving dishes.

The total market for satellite business services in Europe is estimated to grow from $350 million in 1991 to $1.3 billion by

2001.[55]

2.1.5 broadcast, cable, and programming services

The traditional public broadcasting monopolies are rapidly losing market share for viewers and programs to new private programs and channels offered on satellite and cable television. In the U.K. much of the cable television activity is financed by U.S. firms.

Between 1986 and 1990 the number of broadcasting hours on European television has more than doubled. Much of this growth has been from reruns of U.S. programs.[56] Growth over the next decade is expected to continue strong, expanding an estimated 32%, almost all of which is expected to come from new program purchases and reruns. Historically much of the growth came from in-house productions of the public broadcasting monopoly. For the first time in 1992 total private channels is expected to equal public channels. From 1985 to 1990, France public television has lost a whopping 67% of public viewing share. Germany lost 29% over the same period and Italy 41%. This trend is expected to continue, even in the U.K. where the BBC still retains the loins share.[57]

---

[55] Source: CIT Research in "Satellite Earth Stations: New Window of Opportunity," Financial Times, October 15, 1992, Section III, p. X.

[56] Source: Le Champion and Rasamoela (1992).

[57] ibid.

Cable television penetration in Europe ranges from a low of 0% in Greece to a high of 95% in Belgium. The U.K. is only 1%, but growing rapidly, while France is 3.7% and Germany is 31%. Compared to the U.S. at about 55%, there is a long way to go for the large European countries.[58] EC Cable penetration is estimated to rise from 23% of households to 36% from 1990 to 1995, and revenues are expected to rise from $4.6 billion to $14.7 from 1990 to 1999, a 300% increase.[59]

Satellite television is also expected to grow rapidly. Except for Ireland with 42% of households subscribing to satellite television, European country penetration rates are nominal, ranging from 0% in Italy to 5% in the U.K., France and Germany are both less than 1%. Growth in penetration of satellite television households is estimated to be from 3% in 1990 to 16% by 1995.[60]

3.0 broad market trends and implications

The available data leave no question that the European telecom market is ripe for profitable entry by competitive telecom service suppliers. Not only is the European market potential much greater than the U.S. market in terms of raw potential for demand growth (due to low market penetration) and high user population and income

---

[58] ibid.

[59] Source: Kagan World Media, Ltd. (1991).

[60] Source: CARAT TV

levels, but there are other important indicators of latent demand as well. The two most important indicators, which are related, are barriers to entry and high prices. Another important indicator of latent demand, but one that may be largely explained by the other two, is the curiously low per capita calling rates in EC countries.

Entry barriers have insulated the bulk of the EC market for telecom services, about 85%, from domestic and foreign competitors. This is going to change rapidly, either by unilateral government action, as in the U.K., or through indirect means in the form of external pressure from the CEC and the more progressive member states like the U.K. The high prices in the EC, partly a result of entry barriers and a lack of technical alternatives, will begin to plummet as both are overcome.

TOs and state government authorities which "protect" them should take note of the fact that liberalization sows the seeds of long term success for domestic firms in the global economy. The experience of the U.S. and U.K. provides substantial empirical evidence that domestic liberalization is a hugely successful policy for businesses and individual consumers alike. In the case of businesses, growth prospects and profitability are enhanced; in the case of consumers, network service options rise and service prices fall.

Conventional wisdom for TOs, pre-liberalization, is that more

competition necessarily leads to lower prices which, in turn, leads to lower profits. Conventional wisdom is wrong. The error is not in the logic but rather the static nature of the calculus. The telecom marketplace is very dynamic, and price elasticities are functions of time and competitive alternatives. Over time, the innovator and price cutter wins the game. BT, AT&T, and the Bell Operating Companies all faced significant entry and declining market share due to liberalization. Price cutting ensued, technical alternatives developed, but, over the same time, total market volumes and revenues increased substantially and so did profits and the market value of the firm. Furthermore, whereas in the era of monopoly, BT, AT&T, and the Bell Companies, were considered sleepy public firms in the global marketplace, all are now quite active and largely successful in participating in high growth world markets. The lesson is that the incentive to innovate and compete on cost and price is healthy, not just for competitive entrants, but also for the long term interests of the TO itself. In any event, the globalization of world telecom markets is going to occur with or without the participation of any one country or TO.[61] More and more, those countries with competitive domestic markets are demanding reciprocity of entry with major trading partners.

The available data supports the conclusion that liberalization need not undermine either the financial health of the incumbent TO nor

---

[61] This is the theme discussed in Vietor and Yoffe (1992).

the overall spending levels on public telecoms. Over the last decade, competition in the U.S. from growth of private networks was substantial and public network operators were naturally losing market share, yet, over the same time period consumers have increased real spending on public telecoms by 58% to almost $700 per capita per year. The share of U.S. GDP represented by the public telecoms sector almost doubled from 1.8% to 3.3%. What is remarkable about these trends in public telecom spending in the decade of the 1980s is that, at the same time, U.S. consumers were buying much more from third party vendors and providing much of their own services on privately owned networks. If this private spending were included, it is likely that total telecoms would represent as much as 4% of GDP with related equipment and software representing another 1.5%.

In Europe, real spending for public telecoms in the 1980s also increased substantially (54%), but the total pales in comparison to the U.S. At the end of the decade, European spending per capita was only $327. Eastern European countries are lower still. The U.K. with its liberalization policies leads the EC in the area of per capita spending growth. The U.K. public telecom sector in 1990 represented 2.4% of GDP while France and Germany represent only 1.6% and 1.7% respectively. The overall OECD average is 2.3%.[62]

---

[62] Source: OECD (1992), p. 30-31.

3.1 demand trends

Though the U.S. is smaller than the combined Greater European market in terms of total income and population, it still has over half the world market for telecoms. In 1990 the top four EC countries represented only 19% of the world market for telecom services: U.K. (5.6%), Germany (5.1%), France (4.5%), Italy (3.8%). By comparison the U.S. had 50.4%.[63] Germany represents about 30% of the total EC market, yet has a slightly smaller telecom sector than the U.K. which, by comparison, represents only 16% of the EC market. There obviously is a lot of room for growth in Germany but unfortunately it is one of the least progressive major world markets in terms of liberalization policies.

In terms of real growth in telecom service revenues between 1985-1990, Spain (8.5%), Italy (4.9), and the U.K. (4.1%), far outstripped Germany (2.6%), France (2.4%), and the U.S. (.4%).[64]

While the U.S. has about two-thirds of the world market for non-basic telephone services (e.g. radiotelephone and data services), the top four EC countries have only 12% (1990), however for the years 1985-1990, growth rates for both were similar, about 10% per year.[65] The implication of these data is clear: the market "slack"

---

[63] Based on data compiled by OMSYC, "Telecommunication Statistics," (French) 1990, p.47.

[64] ibid, p.48.

[65] ibid, p.54.

in the EC, both in terms of service penetration and world market share relative to per capita income, indicates a very high growth potential compared to the U.S.

Telephone penetration growth rates are about twice as high in the EC as in the U.S. From 1985-1990 the average annual growth of the number of telephones per 100 population are: Germany (3.17%), France (4.43%), Italy (4.21%), U.K. (3.14%), and U.S. (1.79%). As of 1991, there are between 45-50 telephone lines per 100 population in the U.S. and the major EC countries, somewhat higher in the Nordic countries, much lower in Eastern and Central Europe including the CIS (13 average).[66] Growth in telephone penetration in Eastern European countries from 1986-1991 averged 6% annually and is expected to speed up substantially for the rest of this decade. For the Eastern and Central European countries to achieve the goal of 40 telephone lines per 100 population by the year 2000 would require almost 15% per year growth. For these countries to attract private investment, telephone rates will have to rise substantially from their artificially low levels.

Telephone calling rates per capita in the U.S. are three times that for the top 4 EC countries, however, annual growth in calling rates from 1985-1990 in the EC are higher: Germany (3.6%), Italy (4%), U.K. (5.5%), U.S. (2.4%).

---

[66] Source: OECD (1992), p. 100-109.

OMSYC (1992) statistics report the average annual (1990) U.S. expenditure per capita ($445) is more than twice that of the average for the top four EC countries ($200), but average annual growth (1985-1990) again is higher for the EC (5%) vs. (1.5%) U.S.[67]

Overall, the aggregate demand data indicate a vigorous growth potential for the EC relative to the U.S. Of course, much of this is due to starting from lower demand levels, but the available latent demand potential is attractive to would-be entrants.

3.2 price trends

Much of the EC market potential is embedded in price data. The power of price to dramatically impact consumption levels and growth is well understood by now as both BT and the U.S. telephone companies have experienced the effects of aggressive price cutting accompanied by unprecedented growth in network usage. In the case of the U.S., AT&T switched tariff rates fell by over 70% in real terms between 1983 and 1991, and its market share fell 35%, yet, AT&T revenues and profit rates actually held steady due to the positive demand response.[68] Similarly, as competition was introduced in the U.K., BT toll prices fell as market share

---

[67] ibid, p.60, p.62, p.63. Note that the OMSYC statistics in relative terms agree with the OECD spending data reported earlier but that the levels are different due to differences in calculations and base year prices.

[68] Egan and Wenders (1992), p. 26.

declined, but profit growth was substantial.

In a recent article on EC tariffs, the CEC reports some progress in real tariff rate reductions since 1980. However, many problems of differentials in member country tariff practices and intra-EC tariff rationalization remain to be resolved.[69] The CEC reports that overall national tariffs have decreased 2% per year in real terms from 1980-1990. The conclusion drawn however is that price reform is too slow and should accelerate. The strong relationship between price and demand is not lost on the Commission: "The basic fact remains that Europe, relative to the United States, under-utilizes its telecommunications networks. In the United States, revenue per main line in 1990 was over 900 ecu [about $1200], while in the Community it averaged only 630 ecu [about $819], in spite of substantially lower telecommunications prices in the United States in many cases."[70]

The CEC reports the following real price changes for the decade of the 1980s: connection charges (-39%), monthly line rental charges (+20%), local call charges (+3%), intra country toll call charges (-29%).[71] In the U.S., from the shorter time period 1984-1991, the following real price changes occurred: connection charges (+2%),

---

[69] CEC (1992b).

[70] ibid, p.25.

[71] ibid, Exhibit 2.

monthly residential line charges (+15%), monthly business line charges (+8%), intrastate toll call charges (-40%), interstate toll call charges (-72%).[72] By comparison, the EC has far to go indeed. In fact, the Commission indicates that over the last decade nominal telecom service revenues in the EC grew almost 10% per year and, in real terms, 4%.[73] By implication, average inflation must have been 6% per year, or 60% over ten years. This being the case, average EC nominal tariff rates of TO provided toll calls did not decline at all and in fact must have increased, contrary to the U.S. where total inflation for the period 1984-1991 was 22% and nominal tariff rates fell 50%, for a total real price decline of 72%.

The implication of all this data for EC TOs paints a bleak picture for global competitiveness. Given the homogeneous nature of modern telephone network technology, it is only reasonable to assume that the cost structure and cost declines for toll services due to technology adoption over the last decade must be similar for the EC TOs and their American counterparts. Yet, the price trends are very different between them. The only reasonable answer is that political and institutional constraints have held tariff rates in the EC substantially higher than market forces would call for. Incidently, AT&T's toll market share and switched toll prices in the U.S. have stabilized since 1990 indicating that the downward

---

[72] Based on FCC data and estimates from Egan and Wenders (1992), p. 26.

[73] CEC (July 1992b).

trend may be bottoming out.[74] This is an important observation for EC TOs that are afraid competition inevitably leads to an endless downward price and market share spiral.

Currently, the average toll call price per minute in the U.S. is less than $.20. In the EC, the average toll call price is $.33 for intra-country calls and about $1 for inter-country toll calls.[75] The inter-EC tariff rates resemble the rate that U.S. carriers charge for calls between the U.S. and Europe, a much greater distance.

Two major conclusions arise from these data. First, the EC TO provided toll services have extremely high contribution levels, enough to provide heavy cross-subsidies to other markets and costs. Secondly, market demand quantities would rise dramatically in response to toll call price reductions, regardless of the introduction of competition. This signals a major market opportunity for competitive entry and leased line bypass.

The CEC reports average monthly real prices for EC TO leased lines (voice grade) to have fallen about 20% in real terms between 1980-1991.[76] Again, this is much less than the total rate of inflation

---

[74] Based on data in FCC (1992).

[75] CEC (1992b), Exhibits 3 and 5.

[76] ibid, Exhibit 4.

for this period, and therefore implies nominal tariff rate increases. The average monthly rental for a 50km voice grade leased line is reported to be 433ecu or about $463. In the EC, the digital capacity equivalent of a leased line is a DS0 (64Kb/s) circuit. In the U.S. the current price for a comparable leased line circuit is less than half the average EC price. In the EC, higher capacity circuits, which except for the U.K. are not generally available to third parties on demand, such as DS1 lines (2Mb/s), have the capacity of 31 equivalent voice grade circuits (2Mb = 64Kb x 31), and are priced at about $3,000 per month. This is about three times as much as in the U.S. for a DS1 circuit.[77] Leased line rates for DS1 service vary substantially within the EC. In the U.K. the average price is about 20% higher than in the U.S., while France is almost two and a half times higher and neighboring Germany a whopping eleven times higher.[78]

The relatively high service prices in the EC compared to the U.S. are not the end of the story. The same situation apparently exists in the equipment procurement practices of the TOs. For example, in the case of large scale digital network switches, the price charged

---

[77] Source: CEC (1992b). The comparison is not as straightforward as for the simple DS0 (64kb/s) voice grade equivalent leased line price comparison. The reason is that the DS1 circuit in the U.S. has a capacity of 1.5Mb/s or 24 voice grade equivalent channels, instead of the 31 channel capacity of the European DS1 circuit which operates at 2.0Mb/s. Recently the OECD (1992) p. 79-83 also has published leased line and other business service tariff comparisons.

[78] Source: OECD (1992), p. 80.

by the domestic equipment supplier to the TO in major EC countries is reportedly two to three times higher than the equivalent per line price charged by AT&T and Northern Telecom to U.S. telephone companies. In fact, when EC switch manufacturers are bidding on competitive digital switch procurement contracts in the U.S., the bid price is reportedly less than half that offered to their native country TO. The implication is that the domestic monopoly telecom prices may not only be subsidizing other domestic market segments, but also exports.[79]

3.3 technology trends

The impact of rapidly advancing telecommunications technology will no doubt accelerate EC market liberalization. The effects of technology, while indirect, are nevertheless substantial; the mere existence of a cost effective alternative for high quality telecommunications puts tremendous pressure on business to adopt the technology in order to be an effective competitor. This is especially true in telecommunication intensive industries, such as, financial, banking, transportation, advertising/marketing, and professional services. In today's world of business, information and knowledge is king. It is possible in some cases that information and telecommunication technology adoption can make or break a firm in both service and manufacturing businesses. This being the case, businesses will leave no stone unturned in trying

---

[79] Noam (1992) p.330.

to skirt institutional and political constraints on network technology adoption. Indeed, much of the pressure to reform protectionist government policies in EC member countries comes from such large business organizations as the International Chamber of Commerce (ICC) and the International Communications Association (ICA). The strong business customer demand for customization and control over their communication networks, coupled with the very high prices of the TOs, provides a powerful incentive to bypass the TO to obtain better, less expensive, service.

In the area of wireline technology, digital fiber optics represents a technological paradigm shift from analog copper. Current generation fiber optic transmission systems are capable of reliable repeaterless transmission speeds over 100km circuits of 2.4 billion bits per second (Gb/s) over a single tiny optical fiber. The capacity of current generation transmission systems is equal to 37,500 voice grade equivalent copper phone lines. 2.4 Gb/s transmission systems may be purchased in the private network market, and are already being used by private network suppliers in the U.S. for long distance bypass. The total private installed cost of such systems is about $40,000 per mile. Annual maintenance costs are relatively small. This gives a per circuit equivalent private cost of only a little more than a $1 -- not per month, but total cost! While an individual business customer may not need such capacity, the point is that the cost trends for high capacity circuits are significant. Given the level of TO tariffs per call

and per circuit it is no wonder why businesses prefer to bypass.

In the case of the European standard digital hierarchy of transmission speeds, DS0 service (64kb/s - voice grade equivalent line), DS1 (2.0 mb/s or 31 DS0s), DS3 (34 mb/s or 531 DS0s), the bypass cost story is essentially the same. In the cases of DS1 and DS3 service the cost of private systems is a small fraction of the cost of a TO provided facility. In the U.S. these types of transmission systems are the primary vehicle for local access line bypass. The same will be true for the EC countries. The U.K. has a relatively well developed DS1 private network and leased line market, and DS3 bypass is on the horizon. It is safe to assume that the other major EC countries will be soon to follow or risk not being competitive in the market for business telecommunication services.

Fiber optic technology is unsurpassed as a high quality and cost efficient technology for large scale shared transmission trunks. As such, its use is contemplated to serve as the backbone network in combination with local access line bypass technologies such as digital cellular radio and cable television coaxial cable. In the U.S., fiber optic cable backbones are rapidly being deployed by cable television companies. Besides raw cost savings from replacing the coaxial trunk cable and associated (failure prone) repeaters, the fiber optic trunk cable installation allows for quality two-way transmissions to occur on the (now much shorter) coaxial cable

customer access lines. Local mass market bypass on cable television networks is now technically feasible and potentially profitable.

There have also been tremendous strides in the advancement of digital wireless telecommunication technology. In the EC, current plans call for deployment of a Pan-European digital cellular radio telecommunications network using a standardized technology called GSM. Furthermore, in most member states, private competition to the TO cellular system is contemplated. Eventually, digital cellular radio will become a local bypass technology due to its relatively low cost and high quality transmission. In the U.S., cable television networks and others are already contemplating the use of digital radio technology for mass market bypass of the telephone companies' tariffs.

Finally, advanced satellite technology also offers a bypass threat to the TOs, especially for video and data services and future video telephone applications. A relatively new generation of high powered satellites, called Direct Broadcast Satellites (DBS) operating at very high frequencies in the ku spectrum band, are able to provide reliable two-way and broadcast digital service to a very small, inexpensive receiver dish. In the U.S. and elsewhere across the globe this technology is already being used in many niche markets for video, data, and even voice services. In fact, the world's most successful retailer, Wal Mart, has its own satellite VSAT voice and data bypass network installed with over 1600 earth node locations.

DBS transponder capacity for use by business customers to bypass the TOs' tariffs will soon be available in the EC, especially with recent progress in the liberalization of European satellite service markets.

3.4 regulation/politics/institutions

The trends in non-market factors in the EC are at the same time encouraging and discouraging. There are numerous CEC and member state liberalization initiatives, but only in niche telecom markets. The fact remains that 85% of the market is still nominally closed to domestic or foreign competition. The key word however is "nominally." Technology and demand trends, coupled with market globalization, will cause "effective" liberalization to accelerate as official prohibitions become more of a paper tiger. The main problem for the TO monopolies is business incentives to adopt bypass technology.

In the international business market, it is critical to success to be playing on a level field, including the ability to purchase inputs and adopt technology comparable to rivals. The competitive scales will tip in favor of firms which enjoy a technology/price edge over rivals. Even though EC domestic firms would like to respect the local rules and regulations of TOs, their real allegiance is to shareholders. A firm faced with the choice either to be an effective international competitor or a relatively high cost domestic supplier, will choose the former even if it means

stretching the protectionist regulatory rules.

According to many independent assessments, the future for progress in market liberalization over the next five years is not bright.[80] Appendix 3 gives a brief summary of liberalization forecasts for major market segments.

Of particular concern for progress in telecom service market liberalization is the current tension in U.S./European telecom product trade negotiations. In recent years progress has been made in efforts to include services, particularly telecom services, under the GATT. The problem is that, at the same time, the U.S. and the EC have come to loggerheads over trade in the telecom product sector. In the U.S., the bulk of telecom equipment purchases are made by private sector telephone companies, and the U.S. government policy is generally not to dictate procurement practices of private industry. In the EC the situation is quite different. TO equipment purchases generally come under the provisions of rules for government/monopoly procurement. The EC has indicated its willingness to open the market for TO and government telecom equipment purchases under GATT if they can be guaranteed that the

---

[80] Many consulting services and government sources exist for assessing progress in EC market liberalization and some are listed in the references section. The OECD (1992) examines regulatory trends and has produced a market liberalization index (p. 17), as has CIT Research (1992). Also see the regulatory status reports by Northern Business Information (1989) and PTT Telecoms Netherlands (1992).

U.S. telephone companies will reciprocate. The U.S. government policy not to interfere with procurement practices of private business, as long as such practices are legal, will not allow for such a guarantee. The result is a standoff in telecom equipment trade and a nasty spillover effect on trade in telecom services.[81] This situation is made even worse by recent CEC TO equipment procurement directives which explicitly favor the domestic supplier in a competitive bid.[82]

A related CEC product directive refers to competitive terminal equipment supply. Directive No. 88/301/EEC, the Terminal Directive, required member states to open all terminal equipment markets to competition by June 1990. The CEC in its famous "bloodless coup" had previously wrested away control over basic standards requirements for terminal equipment from its member states. Nevertheless, to this day, terminal equipment type approval is still under the purview of individual member states. Consequently, there are still some contentious terminal equipment issues which arise concerning U.S. firms on a case-by-case basis.[83]

---

[81] For a brief discussion of these issues see, USITC (October 1991), p.4-22.

[82] The CEC Procurement Directive 90/531, *Official Journal*, No. L 297, September 17, 1990, provides that: 1) for equipment installation and service contracts over 600,000 ecu, EC bids may be selected over non-EC bids as long as the EC bid is less than 3% higher than the non-EC bid; and, 2) any bid can be rejected if the total value of the contract, including both equipment and software, has less than 50% EC content.

[83] For a discussion of issues see: ICC (July 1992).

Even with these disputes in trade in telecom equipment, major compromises were recently worked out in the latest round of GATT negotiations. Currently, the real linchpin holding up trade agreements in the telecom sector generally is the latest row over EC agricultural subsidies, especially that for oilseeds. This may lead to tariff retaliation on both sides of the Atlantic as both have threatened substantial new restrictions.

The overarching GATT disputes notwithstanding, there are two key CEC service directives which set the trends for liberalization: 1) the ONP Framework Directive, Council Directive No. 90/387, establishing the internal EC market for telecom services through the implementation of ONP; and 2) the Services Directive, Council Directive No. 90/388, concerning competition in the telecom services market.

Basically, the effect of the initial ONP directive is to liberalize the provision and interconnection of TO leased lines to end users and third parties on a non-discriminatory basis on the same terms and conditions as the TO may provide them to its own operating divisions. Most importantly, this directive states that the TO may not restrict the use of such lines in any way, including for reserved TO services as defined in the Services Directive. This seemingly innocuous provision of the directive constitutes an important opening to bypass of TO switched tariffs; so important, that the ICC recently issued what can only be characterized as a

bypass "cookbook," explaining how firms may take advantage of the directive to save on TO charges on switched toll voice and data services.[84] The ONP Directive also calls for a plan to implement similar provisions in the near future for public network interconnection of private network facilities for voice and cellular services. The impact of these initiatives, should they be successful, will hasten bypass and liberalization for the mass market.[85]

The Services Directive basically calls for liberalization of EC VAS markets, and reserves voice services telephony (local and toll) to the TO monopoly. As previously stated however, this directive is a paper tiger for large business customers that will be able to circumvent much of its impact through strategic application of the ONP directive(s). For the mass market of residential and small business customers the effect of this directive is to delay meaningful competition indefinitely. The CEC justification for the Services Directive is based on the provisions of Article 90.3 of the Treaty of Rome which permits the CEC to intervene directly to prevent monopolies from acting against the Community's interests. Article 90 allows the Commission to act without parliamentary opinion or ministerial approval. So far this key directive has

---

[84] ibid.

[85] The success of the various ONP initiatives hinges on the CEC's broader Services Directive which is being challenged.

stood up, but its total success is still uncertain.[86] Should it hold up, along with the ONP leased line directive, this will set the stage for future reviews and directives extending liberalization to those services currently reserved to the TO.

Beyond the trends in Community-wide regulations, there are numerous liberalization activities taking place throughout the countries of Greater Europe. Analysis of these are beyond the scope of this exercise. Suffice it to say that the U.K. is the only major player in Europe which is well on the way to opening its domestic market to meaningful competition, while Germany, France, Italy, and the others have shown relatively little progress in unilateral liberalization initiatives.

4.0 market opportunities and player strategies

As the globalization of markets progresses, U.S. companies are actively gearing up their international operations to tap into the high growth opportunities. This is certainly the case for European telecoms. Entry into overseas telecom markets is still a relatively new venture for most U.S. based firms and their roles and

---

[86] Of particular concern to prospective competitive network service suppliers is that the Services Directive is opposed by a number of member states that claim the Commission may have exceeded its authority under Article 90 and they have presented their case to the European Justice Court. An initial opinion on the case delivered by the EC Commission's Advocate General (February 1990), indicated that the Commission may have exceeded its authority in issuing the earlier equipment directive. See: USITC Third Followup Report, (March 1991).

strategies for filling them are still being defined. The purpose herein is to provide a descriptive view of market activities of major U.S. firms in European telecoms. Higher level analyses, such as the impact of globalization on business organization and operations is beyond the scope of this discussion, however there are several recent books and articles on the subject.[87]

Based on the earlier discussion of prospective market demand, there is a very broad range of European telecom market opportunities for U.S. firms. The primary strategic issue in evaluating these opportunities is making the right technology choice of for the service delivery vehicle. It is critical that a facilities based entrant invest in a delivery vehicle (e.g. radio, fiber optics, satellite) that will be cost effective and robust to both unanticipated changes in demand and the technology deployment strategies of potential rivals; but technology is changing rapidly, and so are the costs of different network delivery systems.

The second strategic issue to consider, not because it is not as potentially important as the first, but because it is exogenous to the firm, is accurately predicting the uncertain regulatory landscape.

Finally, once regulations on entry conditions and operations are

---

[87] For example see: Cowhey and Aronson (1992), ch. 7, Hufbauer (1990), Aronson and Cowhey (1987), Vietor and Yoffe (1992).

forecasted, and a technological choice is made, the facilities-based entrant must decide on issues of financing and selecting equity partners. Largely due to uncertainty concerning the political, institutional, and regulatory, environment, facilities-based U.S. firms almost invariably choose a domestic EC partner before entering the market.

Non-facilities based entrants, such as U.S. firms that engage in pure resale, "soft" telecom services (e.g. network management), and leasing arrangements, do not necessarily require such financing and partner selection decisions. Many U.S. firms operating in Europe, such as the giant VAS provider GE Information Systems (GEIS), typically use TO leased line and public switched network facilities in combination with their own database, network and computing facilities to provide VAS. Partnering in such situations may still be advantageous for reasons of building a customer and supplier base with local knowledge, but not so much for political reasons of overcoming entry barriers.

In discussions with key decision makers in U.S. telecom firms, it is a perpetual understatement that their biggest problems with doing business in Europe are domestic regulations and entry barriers in the case of direct investment, and trade restrictions in the case of exports. While exports are the usual way to tap telecom equipment markets, both U.S. and European firms are finding out that direct foreign investment may be a better business

strategy because it makes it difficult to distinguish "us" vs. "them," and because it creates jobs in the target market. As stated previously, in the case of telecom services, the only practical way to do business is by having a physical presence in the target market. Exports of telecom services, except for international long distance, for which the term export is a misnomer anyway, are very difficult to achieve.

The USITC conducts on-going reviews of U.S. firms' reactions and concerns regarding changes in regulatory policies of the EC and often performs their own interviews with industry representative groups. The periodic followup reports which result from these reviews provide a concise summary of U.S. industry concerns and policy positions.[88]

The bulk of U.S. local and long distance telephone company business in the European market for telecom services is in the form of direct investment in facilities based network services, both basic and VAS. Appendix 1 listed European business activities of major U.S. players. Basic cable and telephone services provision by U.S. firms is dominated by activity in the liberalized U.K. market but it is expected to expand rapidly to many other developing countries of Greater Europe. The only (small) exception here is NYNEX's current operation of the basic phone network in Gibraltar. U.S.

---

[88] For example see the various Follow-up Reports on the EC: USITC (March 1990), (March 1991), (April 1992).

telephone companies do engage in the provision of "soft" network services also, but this financial commitment pales in comparison to facilities based activities. This trend is expected to continue.

In the area of VAS services, there are many U.S. players, both facilities and non-facilities based. The largest U.S. non-telephone company players in the VAS market include: GEIS, EDS, IBM, ADP, CSC, HP, Infonet, and DEC. (A good trivial pursuit question might ask what all these acronyms stand for.) U.S. satellite service providers in Europe include Alpha Lyracom Communications and Orion. Some very large U.S. telephone companies in the European VAS market include: AT&T, MCI, Sprint, and some of the RBOCs and GTE. (More trivial pursuit?) The RBOC and GTE activity in the VAS market is dominated by cellular radio services while the long distance companies are heavily into Virtual Private Networks (VPNs) and data services.

There are very few Pan-European VAS operations owned by U.S. firms. IBM and GEIS both offer some VAS and network management services throughout much of Europe. AT&T, MCI, and Sprint, all have ambitious plans for Pan-European VPNs, but negotiating agreements with individual TOs is a slow and lengthy process.

5.0 summary and conclusions

Based on the discussion in the previous sections on trends in market forces, technology, and regulation, the liberalization of

the EC market for telecom services is proceeding apace as far as a U.S. firms are concerned. The only effective way to compete in the international marketplace for telecom services is not through trade, but through direct investment. U.S. firms are clearly aggressively pursuing this strategy in the EC.

The question is what to make of EC market liberalization and unification/integration initiatives. For U.S. firms, EC market unification/integration initiatives like Maastrict is a "no win" situation. The net effect is to unify and strengthen intra-EC suppliers vis-a-vis their American counterparts. As long as the EC member states are fragmented regarding entry and competition policies, U.S. firms can continue to exploit this to their advantage. Thus, EC unification is a game that is theirs to lose not ours to win.

Conventional wisdom for some observers is that EC market unification/integration is an unprecedented opportunity to market telecom products and services on a standardized basis to the largest consumer market in the developed world. This may be true, but the advantage at the margin, post-unification, will go to intra-EC firms. A close examination of the evidence would indicate that unification/integration has little real impact on the progress of foreign entry into EC telecom markets. The reason is that the CEC is the champion of the telecom market liberalization effort for foreign participation, not Maastrict. CEC pressure, coupled with

the leadership shown by the U.K. are forcing telecom market liberalization to proceed apace, EC market unification notwithstanding. Under current policy trends, nearly all lucrative and high growth EC telecom markets will be ripe for competitive entry and bypass by private firms, foreign or domestic.

What is therefore critical to keep liberalization on track is that the major CEC directives on ONP, equipment, and services, remain intact and withstand challenges by member states. Even though the equipment procurement directive currently discriminates somewhat against foreign suppliers, it is certainly possible to live with. Besides, most forecasts for the equipment sector are for growth which is less than half that forecasted for the services sector, and not even a fourth that for the VAS sector, soon to become wide open to entry. Thus, the U.S. should exercise caution in trade negotiations on equipment procurement so as not to sacrifice our potential competitiveness in lucrative service markets in the name of principles of fairness regarding equipment. Anything is possible in sensitive trade negotiations. We should not assume that our progress in services markets will continue regardless of problems in the closely related equipment procurement area. After all, both telecom products and services are effectively monopoly markets in the EC, and in either case, the major European stakeholders in the negotiations are the TOs themselves. It is not reasonable to assume separability of product and service issues. The perceived risk of sacrificing progress in liberalizing U.S. entry into EC services

markets, which is where the real money and growth is, is not worth defending to the hilt our principles of fairness in equipment procurement.

The best policy for U.S. firms is to back the CEC liberalization initiatives, and to separate the issues of products and services in the GATT negotiations. If progress occurs on the GATT front, that is a bonus, but the CEC and other unilateral/bilateral initiatives between the U.S. and our European trading and business partners is a viable progressive option for pursuing our global business interests.

Bibliography

Aronson, J., and P. Cowhey, *When Countries Talk*, Cambridge, MA., Ballinger, 1987.

Commission of European Communities, *Green Paper on the Development of the Common Market for Telecommunications*, Brussels, June 30, 1987.

_____,"The Electronic Information Services," Panorama of EC Industry, 1989.

_____, *Official Journal of the European Community*, Procurement Directive 90/531, No. L 297, Brussels, September 17, 1990.

_____, *Official Journal of the European Communities*, No. L 165/27 Brussels, June 19, 1992.

_____, "1992 Review of the Situation in the Telcommunications Services Sector," July 10, 1992.

_____, "The European Telecommunications Equipment Industry: The State of Play, Issues at Stake and Proposals For Action," Brussels, July 15, 1992.

_____, "Proposal for a Council Directive on the Application of Open Network Provision (ONP) to Voice Telephony," Brussels, July 16, 1992.

_____, "Open Networks in the European Community: Current state of Implementation of ONP," Brussels, July 31, 1992.

Communications and Information Technology (CIT) Research, *Yearbook of European Telecommunications,* London, U.K., 1992.

Communications International, "Euro VPNs Poorly Priced," August 1992.

Communications International, "Europe's Telecommunications get a timely lesson in taking direction," August 1992.

Cowhey, P., and J. Aronson, "Managing the World Economy: The Consequences of Corporate Alliances," A volume prepared for the Council of Foreign Relations, June 23, 1992.

Datapro, *Reports on International Networks and Services*, McGraw-Hill Inc., 1991.

Datapro/Northern Business Information, *1991 European Networking Survey*, McGraw-Hill Inc., 1991.

Dataquest, *Telecommunications North America,* DataQuest Inc., 1991.

Egan B., and J. Wenders, "The Cost of State Regulation: In Theory and Practice," Columbia Institute for Tele-Information, Research Working Paper #443, Columbia Business School, Revised. 1992.

EDICOM, *Le Guide des Telecoms 1991*, Paris 1991.

Electronics, Penton Publishing, January 1992.

Federal Communications Commission, "International Communications Traffic Data Report for 1990", August 30, 1991.

_____, "Semiannual Study on Telephone Trends," March 3, 1992.

Financial Times, "Financial Times Survey of World Telecommunications," October 7, 1991.

_____, "Financial Times Survey: International Telecommunications," October 15, 1992, Section III.

Fintech Mobile Communications, "The State of European Cellular Markets," Fintech Mobile Communications Company Reports, 1991.

Frieden, R., "International Accounting Rates and the Incentive to Cheat," draft, Penn State University, September 1992.

Hooper L., "IBM and Sears Data Networks Seen Merging," The Wall Street Journal, August 18, 1992.

Intelidata, *ANIEL Report*, December 1991.

_____, *Tarrif Comparisons*, Vol. 1-5, Intelidata Handbook, 1992.

_____, *Telecommunications Source Book 1992*, Intelidata, 1992.

International Chamber of Commerce, "Business Guide to Telecommunications Liberalisation in the EC," Document No. 373/141, July 1992.

International Chamber of Commerce, "Toward Greater Competition in Telecommunications: Basic Services and Network Infrastructure," Position Paper No. 17 of the ICC, March 1992.

International Communications Association, "Telecommunications Expenses Survey 1988-1990," ICA, 1991.

International Institute of Telecommunications, *The Global Telecommunications Traffic Report-1991*, 1991.

Keith B., "Global Telecommunications: Policy Implications in the USA," Telecommunications Policy, July 1992.

Keller J., "Wall Street Journal Report on Telecommunications," The Wall Street Journal, October 4, 1991.

_____, "British Telecom Plans Billion-Dollar Global Network," The Wall Street Journal, August 18, 1992.

Kellerman A., "US International Telcommunications 1961-8: An Integration Movement Model," Telecommunications Policy, July 1992.

Knight I. N., "Global Telecommunications Standards--Who Needs Them?," Telecommunications Policy, May/June 1992.

Le Champion, R., and Rasamoela, P., "The Positioning of Private and Public Channels in Europe," Twentieth Annual Telecommunications Policy Research Conference, Solomons, Maryland, September 1992.

MDIS/McGraw-Hill, *Communications Companies,* 1992.

Nishuilleabhaina A., "Strategic Response by Public Network Operators to Private Networking in Europe," CITI Working Paper No. 484.

Noam E., *Telecommunications in Europe,* Oxford University Press, 1992.

_____, "Telecommunications Reforms at the Periphery: Role Models or Followers," Draft, Columbia Institute for Tele-Information, Columbia Business School, September 1992.

North American Telecommunications Association, "EuroTelecom 1992: A Report on Telecommunications in the EC Market," 1992.

Northern Business Information, *European Telecom Market,* 1990 Edition, McGraw-Hill Inc., 1989.

Observatoire Mondial des Systemes de Communications, *Telecommunications Statistics*, Paris, 1990.

OECD, "Computer Networks In and Before Economic Activities /Sectors," Workshop on Information Technology Networks for Transport, Draft Issue Paper, February 5, 1992.

_____, "Convergence Between Communications Technologies: Case Studies from North America and Western Europe," Information Computer Communications Policy Series No. 28., 1992.

_____, "Telecommunications and Information Services Policies: 1992/93 Community Outlook," OECD Working Party on Telecommunications and Information Services Policies, August 7, 1992.

_____, "The Mobile and PSTN Communications Services: Competition or Complementary?," Working Party on Telecommunication and Information Services Policies, December 2, 1991.

_____, "Telecommunications Type Approval: Policies and Procedures for Market Access," Information Computer Communications Policy Series No. 27., Paris, 1992.

_____, "Telecommunications and Information Policies: 1992/93 Community Outlook," OECD Working Party on Telecommunications and Information Services, August 7, 1992.

"ONP and After: A New Policy Agenda for Telecoms," Briefing Report Series European Telecommunications, Analysys Publications.

OVUM Monitors, "Value Added Network Services Europe," Ovum Ltd., London, April 1992.

PNE, "Bandwidth on Demand and Across Frontiers," March 1992.

PNE, "The European Data Networks," July/August 1992.

Pruzin D., "The Midas Touch," World Trade, July 1992.

PTT Telecoms Netherlands, *Consultant Resource Guide,* 1992.

Sandbach, J., "Network Competition and Value Added Services," *Telecommunications Policy*, December 1991.

Stoetzer, M., "Value-Added Services-Problems of Definition and Data," *Telecommunications Policy*, July 1992.

Telecommunications Global News, "The New International VAN Players Enter Market".

Telecom Research Center, *Market Overview Report 1991*, U.K.

Telecommunications Policy, *Value-Added Services*, December 1991.

Temin, P., and L. Galambos, *The Fall of the Bell System: A Study in Prices and Politics*, Cambridge University Press, 1987.

The Economist, "A Stick and Carrot Game," October 5, 1991.

_____, "International Telephone Calls: The Privateers," September 12, 1992a.

_____, "Maastricht at a Glance," October 17, 1992b, p. 60-61.

_____, "The Uruguay Round: So Near," October 17, 1992c.

_____, "European Telecoms: the Wimps Win," October 24, 1992d, p. 78, 83.

United States Department of Commerce, *Survey of Current Business*, Vol. 71 No. 9, Bureau of Economic Analysis, United States Department of Commerce, September 1991.

U.S. International Trade Commission, "The Effects of Greater Economic Integration within the European Community on the U.S.: First Follow-Up Report," Publication 2268, Investigation No. 332-267, March 1990.

_____, "Second Follow-Up Report," Publication 2318, Investigation No. 332-267, March 1990.

_____, "Third Follow-Up Report," Publication 2368, March 1991.

_____, "Fourth Follow-Up Report," Publication 2501. Investigation No. 332-267, April 1992.

_____, *Global Competitiveness of U.S. Advanced Technology Manufacturing Industries: Communications Technology and Equipment*, Publication No. 2439, October 1991.

_____, "The Likely Impact on the U.S. of a Free-Trade Agreement with Mexico," pp.4/47-4/49, Publication 2353, Investigation No. 332-297.

_____, "Worldwide Telecommunications Market Numbers," 1992.

Vietor, R., and D. Yoffie, "Telecommunications: Deregulation and Globalization," Draft, Harvard Business School, September 1992.

Vossen, W., and W. Shapiro, "Selecting Sites in the Unified European Market," Export Today, May 1992.

Wheeler, J., "Key Issues in Europe's Open Network Provisions," *Telecommunications Policy*, Jan/Feb 1992.

Witte, E., and D. Michael, "Value Added Services: Regulation and reality in the Federal Republic of Germany," *Telecommunications Policy*, October 1991.

Yankee Group, "Unfinished Business: Completing the 1992 Programme," Level 8, Vol. 12, Issue 2, February 1992.

_____, "Wireless and Cable: The Global Ambitions of the RBOCs," Level 8, vol. 12, Issue 6, June 1992.

References

Aronson, J., and P. Cowhey, *When Countries Talk*, Cambridge, MA., Ballinger, 1987.

Commission of the European Communities, 1992 Review of the Situation in the Telecommunications Services Sector, Brussels, July 10, 1992(a).

_____, Towards Cost Orientation and the Adjustment of Pricing Structures - Telecommunication Tariffs in the Community, Brussels, July 15, 1992(b).

_____, Open Networks in the European Community: Current State of Implementation of ONP, Summary, Brussels, July 31, 1992(c).

_____, *Official Journal of the European Community*, No. L 165/27, Brussels, June 19, 1992(d).

_____, Proposal for a Council Directive on the Application of Open Network Provision (ONP) to Voice Telephony, July 16, 1992.

_____, The European Telecommunications Equipment Industry: The State of Play, Issues at Stake and Proposals For Action, Brussels, July 15, 1992(e).

_____, *Official Journal of the European Community*, Procurement Directive 90/531, No. L 297, Brussels, September 17, 1990.

_____, Green Paper on the Development of the Common Market for Telecommunications, Brussels, June 30, 1987.

Communications and Information Technology (CIT) Research, *Yearbook of European Telecommunications*, London, U.K., 1992.

Cowhey, P. and J. Aronson, "Managing the World Economy: The Consequences of Corporate Alliances," A volume prepared for the Council of Foreign Relations, June 23, 1992.

Datapro, *Reports on International Networks and Services*, McGraw-Hill Inc., 1991.

Datapro/Northern Business Information, *1991 European Networking Survey*, McGraw-Hill Inc., 1991.

Dataquest, *Telecommunications North America*, Dataquest Inc., 1991.

Egan, B. and J. Wenders, "The Cost of State Regulation: In Theory and Practice," Columbia Institute for Tele-Information, Research Working Paper #443, Columbia Business School, Revised Draft, 1992.

Federal Communications Commission, "Semiannual Study on Telephone Trends," March 3, 1992.

Financial Times, "Financial Times Survey: International Telecommunications," October 15, 1992, Section III.

Frieden, R., "International Accounting Rates and the Incentive to Cheat," draft, Penn State University, September 1992.

Intelidata, *ANIEL Report*, December 1991.

_____, "Tarriff Comparisons," Vol. 1-5, Intelidata Handbook, 1992.

_____, *Telecommunications Source Book 1992*, Intelidata, 1992.

International Communications Association, *Telecommunications Expenses Survey*, 1991.

International Chamber of Commerce (ICC), *Business Guide to Telecommunications Liberalisation in the EC*, Document No. 373/141, July 1992.

International Institute of Communications, *The Global Telecommunications Traffic Report-1991*, 1991.

Le Champion, R., and Rasamoela, P., "The Positioning of Private and Public Channels in Europe," Twentieth Annual Telecommunications Policy Research Conference, Solomons, Maryland, September 1992.

MDIS/McGraw-Hill, *Communications Companies*, 1992.

Noam, E., *Telecommunications in Europe*, Oxford University Press, 1992.

_____, "Telecommunications Reforms at the Periphery: Role Models or Followers," Draft, Columbia Institute for Tele-Information, Columbia Business School, September 1992.

North American Telecommunications Associations, "EuroTelecom 1992: A Report on Telecommunications in the EC Market", 1992.

Northern Business Information, *European Telecom Market*, 1990 Edition, McGraw-Hill Inc., 1989.

Observatoire Mondial des Systemes de Communications (OMSYC), *Telecommunications Statistics*, Paris, 1990.

OECD, "Telecommunications and Information Policies: 1992/93 Community Outlook," OECD Working Party on Telecommunications and Information Services Policies, August 7, 1992.

_____, "The Mobile and PSTN Communications Services: Competition or Complementary?," OECD Working Party on Telecommunications and Information Services Policies, December 2, 1991.

Temin P., and L. Galambos, *The Fall of the Bell System: A Study in*

Prices and Politics, Cambridge University Press, 1987.

The Economist, "A Stick and Carrot Game," October 5, 1991.

_____, "International Telephone Calls: The Privateers," September 12, 1992a.

_____, "Maastricht at a Glance," October 17, 1992b, p. 60-61.

_____, "The Uruguay Round: So Near," October 17, 1992c.

_____, "European Telecoms: the Wimps Win," October 24, 1992d, p. 78, 83.

U.S. International Trade Commission, "The Effects of Greater Economic Integration within the European Community on the U.S.," First Follow-up Report, Publication 2268, Investigation No. 332-267, March 1990.

_____, Second Follow-up Report, Publication 2318, Investigation No. 332-267, March 1990.

_____, Third Follow-up Report, Publication 2368, March 1991.

_____, Fourth Follow-up Report, Publication 2501, Investigation No. 332-267, April 1992.

_____, "Global Competitiveness of U.S. Advanced Technology Manufacturing Industries: Communications Technology and Equipment," Publication 2439, October 1991.

_____, "Worldwide Telecommunications Market Numbers," 1992.

Vietor R., and D. Yoffie, "Telecommunications: Deregulation and Globalization," Draft, Harvard Business School, September 1992.

Yankee Group, "Unfinished Business: Completing the 1992 Programme," Level 8, vol. 12, Issue 2, February 1992.

_____, "Wireless and Cable: The Global Ambitions of the RBOCs," Level 8, vol. 12, Issue 6, June 1992.

Appendix 1.a
U.S. Companies in European Telecommunications Market

Company/Subsidiary	Owned	Business type	Invest	Market Coverage
AT&T				
AT&T Network Systems, Netherlands	100.0 %	Manufacturing public network equipment		Main production in the Netherlands, subsidiaries in 9 countries. Supplies mobile network equipment to Germany. Joint product development with STET and Italtel, Italy.
AT&T Network Systems, Espana	51.0 %	Product development and marketing for Spanish and Latin America public networks		Provides underwater fiber optic cable, joint venture with Spanish PTO, Telefonica.
AT&T Italia	49.0 %	Fiber optic network		Fiber optic cable between US and Spain with branches in Italy and Mexico.
AT&T Tridom		Hardware and software supplier for satellite network		Two-way shared network using Eutelsat for Teleport Europe.
AT&T Istel Personal Networking Ltd. ViewTel Holding Ltd. Infoplan GmbH.	100.0 % 100.0 % 76.0 % 50.0 %	Information technology services (Infotrac, Witness, Inview life insurance, travel services etc.)		Information systems mainly in UK. Infotrac in 20 countries. Acquired Infoplan to open to German market.

MCI				
Infonet	25.0%	Electronic data interchange		Infonet purchased 67% of Osiware, Paris which provides software products for EDI and X500 directory systems.
		Satellite communications		Satellite based live videoconferencing system between Moscow and US.
SPRINT				
Sprint International		Long distance services		Competing against BT and Mercury in domestic UK long distance services.
		International value added network		Unilever's 17 country European communications network.
UK consortium GPT US Sprint British Waterways		Fiber optic network	US$ 50 M	2000 km fiber-optic cable laying in British Isles.
Ameritech				
		Voice-messaging services		UK.
		Yellow pages		Germany.
		Consulting		France.
Polska Telefonia Komorkowa	24.5 %	Mobile communications	US$ 50 M	Poland, mobile cellular network.

Bell Atlantic				
		Mobile communications		Moscow.
EuroTel Cellular		Mobile communications	US$ 80 M	Joint venture with US West to build Czechoslovakia's mobile network.
Olivetti consortium		Mobile communications		Italy, bidding for 2nd GSM license.
Joint venture with STET	49.0 %	Network management software		Italy.
		Cable TV franchise		France.
		Cable TV franchise		UK, CATV services.
Bell South				
Dansk Mobilfon	29.0 %	Cellular mobile network		Denmark, license holder for GSM.
Societe Francaise du Radiotelephone	4.0 %	Cellular mobile network		France, license holder for GSM.
ENI Consortium		Cellular mobile network		Italy, bidding for second GSM license.
AirCall Communications	40.0 %	Cellular operator		
Partnership with France Telecom		Cable TV frachise		France.
		Cable TV franchise Paging services	US$ 1-3B	UK, Cable TV franchise investment joint with NYNEX, US West and Southwestern Bell group. Paging operator in UK.

NYNEX				
	50.0 %	Public network operator		Gibraltar, public network.
NYNEX DPI		Network operating software		Moscow.
NYNEX Network Systems Co.		Fiberoptic long distance links		Fiberoptic Link Around the Globe (FLAG) project under consideration. Link will join UK, Gibraltar, Italy, Egypt, India, Indonesia, Singapore and Malaysia.
		Consulting		France, UK, Russia.
Nynex Information Resources		Yellow pages		Gibraltar.
Nynex Information Resources		Yellow pages		Czechoslovakia.
		Cable TV franchise		UK, CATV services
		Long distance services		France, Nynex is trying to join up with France Telecom to give a Paris-New York link.
Pacific Telesis (PACTEL)				
Mannesmann Mobilfunk	26.0 %	Cellular mobile network	US$ 208M	Germany, license holder for second GSM license.
Telecel	23.0 %	Cellular mobile network	US$ 44M	Portugal, GSM license holder for 15 years.
		Cable TV franchise	US$ 1-3B	UK, Cable TV franchise investment joint with NYNEX, US West and Southwestern Bell group.

Joint venture with Bouygues, France		Cellular mobile network		France, public access mobile radio.
Microtel		Cellular mobile network		UK, PCN license holder.
Southwestern Bell				
		Cable TV franchise	US$ 1-3B	UK, Cable TV franchise investment joint with NYNEX, US West and PacTel group.
U.S. West				
Eurotel	24.5 %	Mobile communications		Czechoslovakia, digital cellular systems installed.
Moscow Cellular Communications	22.5 %	Mobile communications		Digital cellular system in Moscow.
Delta Telecom	40.0 %	Mobile communications		Digital cellular system in St. Petersburg.
United Communications International		Local Area Networks		UK, Croydon district local telephone services.
Hungarian RadioTelephone	49.0 %	Mobile communications		Joint venture with Hungarian Telecom Co. to set up analog cellular network in Hungary.
International consortium		Fiber optic cable		Trans-Siberian fiber cable to join Japan and Europe.
		Gateway switches		Russia, Lithuania.
		Mobile communications		Germany, bidding for 3rd GSM license.

Unitel		Mobile communications		UK, PCN license holder
Mercury Personal Communications		Mobile communications		UK, joint venture with Cable & Wireless.
		Cable TV franchise		France, Hungary, Norway, Sweden, Malta.
Windsor Cable TV	20.0 %	Fiber optic lines for telephone and TV services		Fiber optic cable TV in UK.
Electronic Data Systems (EDS)				
EDS		International private digital network. VAS (E-Mail, EDI Interfacing, Network Management).		Holds SSSO license in UK for business TV, videotex and data distribution via satellite. SAAB, Sweden. 10 years contract for information systems management Social Security Department, UK. Data management systems. Credit Lyonnaise, France. Data center at Paris.
SD-Scicon		Value Added Services		France joint venture with GFI.
General Electric				

GE Information Services		MNS, remote computing, E-Mail, EDI		Dutch PTT, managed network service linking government institutions, 5 year contract. Vatican, information services for linking 50 branches worldwide. Germany, agreement with Meganet to cooperate in voice and data communications in Germany. Italy, private data network for Benetton. Netherlands, fast packet switching.
INS	40.0 %			Information system services in UK
GTE				
Sovintel		Value added services		Digital network for hotels in Moscow
		Mobile communications		Germany, bidding for 3rd GSM license (E1).
IBM				
Axone	45.0 %	VAS		France, value added services
Intesa	50.0 %	VAS		Italy, value added services
Integrated Systems Solutions		Facilities management services		

Telecash	50.0 %	EFTPOS service		Germany, joint venture with DBP Telekom to run EFTPOS on Eurocheck cards.
IBM Information Network		EDI, E-Mail, database access, videotex		
Motorola				
Mercury PCN		Mobile communications		UK, PCN license
Quickfunk		Mobile communications		Germany, 3 licenses to operate public access mobile radio.
Motorola Data International		Wireless data network	US$ 6 M	Germany, wireless data network
Motorola UDS		Equipment wholesale		Paris and London offices
Motorola Telepoint Systems		Telepoint equipment		Finnish CT2 telepoint services equipment. Munich-Germany CT2 connection.
Motorola Inc.		Electronic data interchange		EDI system jointly produced with Citibank to be used in EEC banking transactions.
Motorola Inc.		Cellular equipment	$US 5 M	Hungary, cellular telephone equipment.
Northern Telecom				

Northern Telecom Europe		Switching networks		Poland, DBS switches. Spain, DPN100 packet data switch. Germany, PMS100 supernode switch, ISDN. UK, PCN switches.
Merger with STC	27.0 % of STC	Optoelectronic and cable systems	US$ 65 M contract	Undersea fiber optic connection between Denmark and Russia.
NT Meridian SA	79.0 %	Digital telephone systems for business applications (Norstar)		Mainly UK.
NETAS	81.0 %	Switching networks, public lines		Turkey, 70% of total public lines, electronic fund transfer system.

Appendix 1.b.
European Companies in U.S. Telecommunications Market

PTT Belgium				
Infonet	5.4%	VAS: 40% VAN transport, 40% data timeshare processing, 20% network information services		200 US access points; 38 nodes in 34 foreign countries
British Telecom				
BT North America	100.0%	VAS: public (60-70%) and private packet networks	$335 M 1989 est.	800 US access points; direct access nodes in 20 countries.
Syncordia	100.0%	Managed network services	$200 M	NCCs in London, Atlanta, Tokyo,; backbone hub connections in 14 cities worldwide.
BT&D Technologies America	50.0%	50% DuPont; development and manufacturing of optoelectronic equipment		North America
McCaw Cellular	21.0%	Cellular systems	$1.5 B	Ownership in 18 of 50 largest MSAs.
BT US Paging	80.0%	Metrocast, radio paging, discontinued 1990 due to low demand		

Mitel (Canadian)	51.0%	Canadian company acquired Trillium Telephone Systems of the US, supplier of electronic key systems		North America
VoiceCom Systems	28.0%	VAS: voice processing services and systems; joint marketing agreement with AT&T VoiceMail		Based in CA; available in US, UK, Japan
Cable & Wireless				
C&W Communications Inc.	100.0%	Switched/dedicated services for business customers		43 states; ILD dedicated to Canada, resale to overseas points
DataAmerica	100.0%	Data networking packet switching		Nationwide with international linkage to other C&W networks.
North Pacific Cable	20.0%	Pacific fiber cable: US end of system owned 80% by PacTel		Links Japan, Alaska and US
Deutsche Bundespost				
Infonet	16.1%	See PTT Belgium		
France Telecom				
Minitel Services Co. (Intelmatique)	49.0%	Infonet owns 51%; informational services for residential markets		North America

Minitel USA (Intelmatique)	100.0%	Development of videotex networks and services		North America
Community Link Minitel Associates (Intelmatique)	40.0%	US West owns 60%; videotex services		US West area; gateways in Minneapolis and Seattle
Cylix Communications (France Cable et Radio)	80.0%	VAS: satellite based data networking		42 data nodes in the US and Canada
TRT/FTCC (FCR)	14.9%	See Cable and Wireless		
Cruisephone (FCR)	50.0%	Cellular and satellite communications for cruise ship industry		Worldwide
Infonet (Transpac)	16.1%	See PTT Belgium		
Italcable				
VoiceMail Int. (TeleMedia)	37.0%	VAS: international voice messaging services and systems		Based in California
Netherlands PTT				
Infonet	5.4%	See PTT Belgium		
Swiss PTT				

Infonet	5.4%	See PTT Belgium		
Telefonica (Spain)				
Infonet	5.4%	See PTT Belgium		

Appendix 2.a
Digital Cellular Licenses and Investments in European Economic Area

Country	License Holder	Share	Date	Investments	Comments
Austria	Austrian PTT	100.0%			NMT450 and TACS900 analog systems exist. GSM to be built. Sole licensee is OPT (Austrian PTT).
Belgium	Belgian RTT	100.0%			NMT450 analog system exists. GSM to be built. Sole licensee is RTT (Belgacom).
Denmark	1. Statens Teletjeneste (PTT) 2. Dansk Mobiltelefon Bell South (US) GN Great Northern (Denmark) NordicTel (Sweden/UK)	100.0% 29.0% 51.0% 20.0%	1991	$120 million in 1990-2000	NordicTel:Vodafone(UK) SAS, Volvo and other Swedish firms. Service in April 1992, NMT450 and NMT900 analog systems exist under Telecom Denmark monopoly.

Finland	1. Telecom Finland 2. Radiolinja	100.0% 100.0%	1991		Duopoly for GSM. NMT450 and NMT900 analog systems exist under Telecom Finland monopoly.
France	Societe Francaise du Radiotelephone (SFR) Compagnie Generale des Eaux (France) BellSouth (US) Vodafone (UK) Fabricom (Belgium) Magneti Marelli (Italy)	42.0% 4.0% 4.0% 25.0% 25.0%	1989		Radiocom 2000 analog system exists under France Telecom monopoly. NMT900 is licensed to SFR. GSM licensee is to be chosen.
Germany	1. DB Telekom 2. Mannesmann Mobilfunk Mannesmann AG (Germany) PacTel (US) Deutsche Genossen Bank (Germany) Lyonnaise des Eaux (France) Cable & Wireless (UK)	100.0% 51.0% 26.0% 0.0% 8.0% 5.0%	1989 1989	DM 350 mil. by 1989 DM 2.5 bil. by 1994 DM 4.0 bil. by 2000	Service in July 1992. Third license (E1 for 1.8 GHz) to be announced by end of 1992; bidders: Pressuen group: BellSouth (US) Vodafone (UK) BMW group: GTE (US) Hutchison Telecom (Hong Kong) MAN group, including US West.
Gibraltar	NYNEX (US)	50.0%	1991		

Greece	STET (Italy)	100.0%	1992 plan	$ 160.9 million bid for license of 20 years, exclusive for 8 years only.	Second highest bid: Panafon: Intracom (Greece) Data Bank (Greece) France Telecom Vodafone (UK)
Iceland	Iceland PTT	100.0%			NMT450 analog system exits. Sole licensee is P&T administration.
Ireland	Telecom Eireann	100.0%		GSM will start in 1993. Second license may be offered later.	TACS900 system, sole licensee Telecom Eireann.
Italy	SIP-Societe Italiana per l'Esercizio Telefonico	100.0%	1992 plan	Bidders for 2nd license: FIAT consortium: Vodafone (UK),25% Olivetti consortium: Swedish Telecom Bell Atlantic (US) Cellular Comm.Inc. ENI consortium: Bell South (US) Millicom (US) Other Italian group: PacTel (US)	Decision on whether or not to issue a 2nd GSM license is expected by October 1992. RTMI and TACS900 analog systems exist under SIP monopoly.

Luxembourg	Luxembourg PTT	100.0%			Only NMT450 analog system exists. Sole license holder is Luxembourg PTT.
The Netherlands	Niederlanden Postenijen Telegraphie en Telefonie (PTT)	100.0%		Bidders for 2nd license: 3 major Dutch banks Millicom (US/Sweden) Willing to join bidders: BT (UK) GTE (US) PacTel (US) Mannesmann Mobil-funk (Germany)	Second license for GSM is expected by end of 1992. NMT450 and NMT900 analog systems exist under PTT monopoly.
Norway	1. Norwegian Telecom. Admin. (PTT) 2. Netcom Comvik (Sweden) Orkla Borregaard (Norway)	100.0% 33.0% 67.0%	1991 1992		Second GSM license was offered in 9/92 to Netcom. NMT450 and NMT900 analog systems exist under Norwegian PTT monopoly.

Portugal	Telecel PacTel (US) LCC (US) Various Portuguese investors	 23.0% 2.0% 75.0%	1991	$44 million by PacTel in 1991-1994.	GSM license for 15 years Service in 1993. Foreign investment limited to 25%. C450 analog system exists under TP/TLP monopoly.
Spain	Companie Telefonica Nacional de Espana	100.0%		Second license will not be offered till end of 1994.	TACS900 and NMT450 exists. GSM to be started end of 1992.
Sweden	1. Televerket 2. Comvik 3. Nordictel (Sweden/UK) Vodafone (UK) SAS Volvo Other Swedish firms	100.0% 100.0% 100.0%	1991 1991 1992		NMT450 and NMT900 analog systems exists. GSM introduced in 1991, open to competition.
Switzerland	Swiss PTT	100.0%			Only NMT900 analogue system exits. Sole licensee is Swiss PTT

U.K.	GSM licensee : 1. Vodafone 2. Cellnet PCN licensee : Mercury PCN Mercury, Motorola, Telefonica. Microtel British Aerospace, Pacific Telesis, Millicom. Unitel STC, US West, Thorn EMI, DBP Telecom.				GSM is to be launched by the end of 1992. 60% of Cellnet is owned by British Telecom.

Appendix 2.b
Digital Cellular Licenses and Investments in Eastern Europe

Country	License Holder	Share	Date	Investments	Comments
Byleorussia	CommStruct International (US) Byleorussian PTT				Will participate in future Russian GSM.
Czechoslavakia	Eurotel US West (US) Bell Atlantic (US) Czech & Slovak PTTs	 24.5% 24.5 51.0%	1990	$60 million to be invested till 2000.	On line as of late 1991.
Estonia	Eesti Mobiil Telefon (EMT) Telecom Finland Swedish Telecom Estonian PTT	24.5% 24.5% 51.0%	1990		Baltic systems are compatible with the Scandinavian, Moscow and St.Petersburg cellular networks.
Hungary	Westel US West (US) Hungarian Telecommunications Co.	 49.0% 51.0%	1989	$13 million has been invested so far by US West.	On line by 1990.
Latvia	Swedish Telecom Telecom Finland Three Estonian investors		1991		On line by 1992.

Lithuania	Comliet Millicom (Sweden/US) Vilnius Telephone Network (Lithuania) UAB Antena (Lithuania)	 49.0% 41.0% 10.0%	1991		
Poland	Polska Telefonia Komorkowa Ameritech (US) France Telecom Polish PTT	 24.5% 24.5% 51.0%	1991	$50 million investment over 3-4 years.	On line by the end of 1992.
Romania	Nationwide Cellular (US) Romanian PTT	51.0% 49.0%	1991		
Russia	Millicom (Sweden/US) Bell Canada US West (US)				Will participate in future GSM projects. Motorola and Bell Atlantic also being considered.
Russia (Moscow)	Moscow Cellular Communications US West (US) Millicom (Sweden/US) Various Moscow City and Russian State entities	 22.0% 20.0% 58.0%	1991	$7 million initial investments.	On line by early 1992.

Russia (Moscow)	Euronet Plexys Int. (US) Information Transfer Technical System Center (Russian Ministery of Foreign Affairs) Vimpel Co. (Russian government contractor)		1992		Will compete with US West-Millicom 450 MHz system.
Russia (St. Petersburg)	Delta Telecom US West (US) St.Petersburg City Telephone Network Production Association St.Petersburg Station Technical Radio Control	 40.0% 55.0% 5.0%	1991		On line by late 1991.
Ukraina	Ukrainian Mobile Company DBP Telekom (Germany) PTT Telekom (Netherlands) Telecom Denmark Ukrainian Government	 16.3% 16.3% 16.3% 51.0%	1992		The consortium is licensed to provide paging, analog cellular, GSM and PCN services.

Appendix 3

Regulatory Environment in Europe

This appendix summarizes the status and trends of telecommunications regulation in Europe. Earlier this year an OECD working party on Telecommunication and Information Services Policies presented a country-by-country analysis on the degree of liberalization for various OECD countries, including the EC. This data is presented in Figure 3.A

A recent CIT Research Ltd. study forecasting the degree of openness for the EC area, indicates that for basic network services between 1990 and 1995, the degree of openness does not change significantly. However, the CIT data shows greater progress in ANS (Alternate Network Services). For a summary of the CIT data see appendix Table 3B.

AUSTRIA

Status: The state controls the entirety of telecommunications services through the Austrian PTT, (Post- und Telegraphenverwaltung) and through Radio Austria, a state-owned company which has a monopoly on international telex, teletex, e-mail, facsimile, and data services. The Federal Ministry of Public Economy and Transport is the Regulatory Body. The PTT retains a monopoly in mobile communications. While the interconnection of international leased lines to the PSTN is permitted, the interconnection of domestic leased lines is allowed only at one end. Only non-voice traffic is allowed in the interconnection or resale of leased lines. Furthermore, resale is only for companies in the same line of business and third party traffic is subject to significant restrictions.

Trends: The incorporation of the Austrian PTT may occur in late 1992. Austria has applied for membership in the EC, but has not followed the deregulatory policies of the countries it is aspiring to join.

BELGIUM

Status: The Regie des Telegraphes et des Telecommunications (RTT) retains a monopoly on the provision of telecommunications services. A founding member of the European Community, Belgium has traditionally been hesitant to implement reforms from the inside and has only done so in compliance with EC directives. The RTT is the sole analog cellular operator. The interconnection of international leased lines is allowed, but domestic lines can only be interconnected at one end. No capacity resale is permitted and interconnection is only allowed as a VAS.

Trends: The progressive liberalization of equipment supply is on the way, though informal and administrative barriers will remain for some time. Value added services should be opened to competition. 1993 will see competition introduced in X.25 data lines.

DENMARK

Status: The provision of telecommunication services lies in the hands of the recently created Tele Danmark A/S and its five subsidiaries (Telecom Danmark and four regional operating companies), as a result of the separation of the operating and regulatory activities from the former PTT. The regulatory body is the General Directorate for Post and Telegraphs Organization National Telecom Agency. Tele Denmark A/S retains most of its monopoly powers in voice and video services. However, in 1990, the monopoly powers in terminal equipment link-up and the establishment of internal networks was withdrawn. A duopoly exists in the area of digital mobile communications, but analog systems are under Tele Denmark monopoly control. Denmark allows interconnection of both domestic and international leased lines but only as a VAS. Resale is permitted, but it is subject to the same VAS condition.

Trends: The Data Communications field will be fully liberalized by the end of 1993. Denmark has demonstrated some willingness to reform, especially in the area of private networks, but it has been resistant to allowing competition in the area of infrastructure.

FINLAND

Status: Finland is a member of the European Free-Trade Association (EFTA), but has, nonetheless, followed the regulatory reforms of the EC and is considered to be very liberal, second only to the United Kingdom. Telecom Finland and fifty-eight local companies (Association of Telephone Companies) compete and are responsible for the provision of telecommunication services to the south of the country. Telecom Finland, however, is the provider for the rest of the country. At present, terminal, value-added data networks and markets are open while there remain some restrictions on private networks. A monopoly still exists in trunk networks, telex and telegraphy. Telecom Finland also has a monopoly over international services but allows competition in domestic leased circuit provisions. Though resale and interconnection of both domestic and international leased lines are allowed, there are restrictions: use is restricted to the leasee and his customers and no transit traffic is allowed. In mobile, a duopoly exists in both analogue and digital cellular communications. Competition among the local companies has been limited however, by the fact that they are not allowed to provide a switched voice service.

Trends: Finland has expressed its commitment to introduce competition in local and trunk public-switched telephone networks (PSTN) in 1993. There is discussion about licensing the independent telephone companies to provide switched long-distance and mobile radio services.

FRANCE

Status: France Telecom, a government owned public corporation, is the principal provider of telecommunication services. France Telecom is a state owned monopoly under control of the Ministry of Posts and Telecommunications. Limited private network competition exists in basic data services, however, licensing conditions continue to protect much of France Telecom's revenue base. Value-added service markets are open to competition, while support services are subject to limited competition. Interconnection of international and domestic leased lines with the PSTN is allowed, but no voice services are permitted; third party traffic and the resale of leased

lines are allowed exclusive of voice services. In analog mobile telephony, France Telecom retains its monopoly while paging, cellular and other mobile radio have been gradually opened to competition since 1987. Competition is permitted for VSAT networks but only for closed user groups.

Trends: Future possibilities for new entrants lie in data communications and value-added services. However, the new rules of government authorization will present delays. A private licensee for digital mobile service is expected to be chosen soon. In 1993, competition is expected to be introduced in X.25 data lines.

GERMANY

Status: In 1989, the government separated the regulatory and operational activities of the former PTT and created DBP Telekom. DBP remains a public monopoly under control of the Ministry of Post and Telecommunications and the Parliament. The terminal market has been nominally liberalized, however, type-approval restrictions remain a barrier to entry. Value-added service markets have been partly liberalized including private data networks. Digital mobile telephony is closed to competition, and analog remains under the sole control of DBP Telekom. DBP Telekom still retains a strong monopoly over basic network and voice telephone services. Interconnection of domestic and international leased lines to the PSTN is permitted, but no third party voice traffic is allowed. Non-voice third party traffic is allowed, but with significant restrictions. Resale of leased lines is allowed subject to the same interconnection condition.

Trends: Privatization of the main operator is under discussion. Competition in X.25 data lines and paging is expected to begin in 1993. Germany is moving towards liberalization and meets current EC Directives. Germany's priority now is to modernize and upgrade the former East German Network.

GREECE

Status: The Hellenic Telecommunication Organization (OTE) is the provider of all telecommunication services. It is a state owned public utility and is subject to the Ministry of Transport and Communications. It maintains a monopoly

on the provision of networks for telecommunications and broadcasting. The OTE does not allow international or domestic leased lines to interconnect with the PSTN. No analog service exists in mobile communications, but a digital cellular license has been granted to the Italian operator, STET. Under pressure from the EC, the OTE has relinquished its monopoly over terminals.

Trends: Greece is expected to allow interconnection of leased lines once the EC Directive on Open Network Provision takes effect in 1993. A second cellular license is expected to be granted in the near future. X.25 data lines will be opened to competition in 1997.

IRELAND

Status: Telecom Eireann, having achieved financial independence from the government since 1991, remains a state-owned company subject to the Department of Tourism, Transport and Communications. Telecom Eireann holds a monopoly on basic telephone, telex, and data services as well as in cellular. The interconnection of domestic and international leased lines to the PSTN is still prohibited as well as the resale of these lines. Other markets such as modems, facsimile, and telex equipment have been nominally liberalized. Yet, suppliers of PBX often encounter obstacles in competing with Telecom Eireann.

Trends: Ireland is having a difficult time meeting the objectives of the EC Green Paper as evidenced by its resistance to competition in basic data, mobile, and satellite communications. However, it is expected that in 1993, competition will be allowed in X.25 data lines. Interconnection of leased lines to the PSTN is also expected during the same year. In mobile communications, a second cellular operator may be allowed.

ITALY

Status: The PTT and its concessionary companies are responsible for the telecommunications sector. These firms, SIP, Italcable, ASST, and Telespazio are controlled by STET, a financial holding company. They are geographically and functionally divided monopolies and control infrastructure, voice, data, and mobile services. SIP has a monolpoly in analog cellular systems. Competition for services is allowed only among state-owned companies. There does exist competition in

equipment and the terminals market, but new entrants must ally themselves with the local suppliers as in other EC countries. Nominal competition exists in the value-added services market. Italy does not allow domestic or international leased lines to interconnect with the PSTN.

Trends: There are plans to privatize SIP and to consolidate services under Telecom Italia. There is strong lobby in favor of adding a second cellular operator in the market by 1993. Competition is expected in X.25 data lines in 1993. Furthermore, the usage conditions for leased lines are under discussion and the interconnection of domestic and international leased lines to the PSTN is expected in 1993.

LUXEMBOURG

Status: The Administration des Postes et Telecommunications is the PTT responsible for public telecommunication services. In 1990, the PTT undertook the task of separating the postal and telecommunications services. It retains a monopoly on traditional telephone and telex services, including infrastructure and leased lines. Its equipment market is very open . The mobile communications market, on the other hand, remains monopolized.

Trends: Luxembourg is a member of the EC and should be expected to liberalize the value-added services sectors in the long run. Competition in X.25 data lines will be introduced in 1993. Privatization of the PTT is being discussed, but given Luxembourg's size and population, the incentive for additional operators is not very high.

NETHERLANDS

Status: The Netherlands was the first continental European country to privatize its PTT. In 1989, Dutch PTT Telecom BV became a government-owned public limited company. Deregulation is controlled by the Department for Telecom and Post (HDTP), a directorate within the Ministry for Transport and Public Works. Dutch PTT Telecom at present retains its monopoly over basic network and basic telecommunication services until January 1994. Nevertheless, competition already exists in the terminal equipment market. Dutch PTT Telecom can also compete in the open market for sophisticated value-added services. Meanwhile, in mobile, the PTT retains its monopoly on analog cellular. Leased lines, both

international and domestic are open but only as a VAS. Although no capacity resale exists, third party traffic is allowed subject to significant restrictions.

Trends: Digital cellular is in progress and a second license in is expected to be offered in 1993. Competition will also be introduced in X.25 data lines.

NORWAY

Status: Norway, like Austria and Finland, is not a member of the EC but is a member of the EFTA. Norwegian Telecom, a state monopoly, is a publicly owned state entity under direct control by the Ministry of Communication. Regulatory affairs are handled by the STF, the Norwegian Telecommunication Regulatory Authority. The STF handles type approval of telecommunication and related equipment. Norwegian Telecom retains a monopoly in two-way transmission of video, data, text, and picture between subscribers in the public network. Leased lines remain under monopoly control; no resale, no interconnection of international leased lines is permitted, and no third party traffic is allowed. However, interconnection of domestic LLs at one end is allowed. At present, a monopoly exists in analog cellular communications, but a duopoly is planned in digital cellular. Even though liberalization has occurred in equipment and terminal markets, there exists a bias toward local rather than imported equipment.

Trends: Despite its non-membership in the EC, Norway has shown a willingness to comply with EC Directives as demonstrated in the equipment and terminal markets. Also, further opening of competition in value-added services is expected. In mobile, a second cellular license is expected to be awarded by the end of 1992. In 1993, competition in paging and in X.25 data lines will be introduced and third party traffic will be allowed in leased lines. Norwegian Telecom plans to participate in the competitive markets through a subsidiary limited company: TBK.

PORTUGAL

Status: In 1990, the Portugal Telecom was created as an autonomous entity from the PTT. Portugal Telecom, a public administration, regroups two other state bodies: TLP (Telefones de Lisboa e Oporto) and CTT (Correios e Telecommunicaceos de Portugal). The former is a private

company with a majority share by the state (80%). The latter handles the rest of the country's telephone network as well as telex, and international telephone service. A third and quasi-private company, CPRM (Companhia Portuguese Radio Marconi) has a concession to operate intercontinental services via submarine cable and satellite. At present, no cable market exists in Portugal. Liberalization has occurred in the terminals and equipment markets in accordance with EC Directives. In the case of leased lines and local PSTN, competition is allowed at the border of concessions. Competition has recently been permitted for digital cellular radio and paging systems, but Portugal Telecom retains a monopoly in its analog cellular system. In 1992, Portugal's first private joint-venture company, Telecel-Comunicacoes Pessoasis S.A. began operation as a digital cellular operator. The government has created a holding company, CN-Comunicacoes Nacionais, to manage the country's telecommunications companies.

Trends: The gradual privatization of basic telecommunications services is on the way. The CTT will be split into separate telcommunications and postal services. Competition in X.25 data lines is expected to be introduced in 1997. Although Portugal must comply with the rest of the EC reforms, implementation will be complicated due to the need for development and modernization of infrastructure.

SPAIN

Status: Telefonica de Espana is the major provider of telecommunications services. It is a private operating company with public ownership of approximately thirty percent. The DGCT (Direccion General de Correo y Telegrafos), a department of the Ministry of Transport and Telecommunications (the regulatory body) has a monopoly on telegraph and telex service. Telefonica retains its monopoly in the basic bearer and end-to-end services as well as in infrastructure, including leased lines where no interconnection with the PSTN is allowed. The 1987 telecommunications law (LOT) provides for competition in the terminal equipment supply and value-added services. Competition has been introduced in radio paging, however.

Trends: Under pressure from the European Community, Spain has moved to compliance with the Green Paper Directives. As a result of this pressure, competition may be allowed in new services such as mobile telephony by 1994. In 1997 competition will also be introduced in X.25 data lines.

Ultimately, market such analog and digital cellular radio might be opened if the aforementioned regulatory reforms are positive.

SWEDEN

The Swedish market for the provision of telecommunication services has always been open to competition. Nevertheless, there exists a de facto monopoly with the Swedish Telecom (Televerket) as the sole operator; it is a public corporation, but it does not operate under an exclusive concessionary agreement. The Ministry of Communications determines the telecommunications policy. Swedish Telecom is responsible for both international and national telecommunications services carried via cable, including cable TV and radio, and related services for data, text, telephony, and image. Competition is permitted in the supply of value-added services, text services and equipment. In leased lines, resale is permitted as well as third party traffic. Interconnection with the PSTN is also allowed, but interconnection of domestic LLs is only allowed at one end. Mobile telephony is also open to competition, but analog cellular is duopolized. Like in many countries, the national industry is heavily entrenched and can easily challenge foreign suppliers.

Trends: Sweden, an EFTA member, has applied for membership to the European Community and thus can be expected to introduce more reforms in line with EC Directives. Privatization of the main operator is under discussion.

SWITZERLAND

Status: In 1991 the Telecommunication Act was passed and effectively separated the telephone operator, Swiss PTT, from the PTT Ministry. The Federal Department of Transport, Communications and Energy and OFCOM monitor the Swiss PTT. The new law allows the Swiss PTT to retain its monopoly in basic services and the physical network. The interconnection of leased lines to the PSTN is permitted as well as the resale of these line. Third party traffic is allowed, but again, restrictions abound and only non-voice traffic is permitted in the interconnection and resale of lines. The Swiss PTT has a monopoly over the sole cellular system (analog). Still, competition in paging is allowed. All other services have been deregulated.

Trends: Since 1990, Switzerland has complied with the EC

Directive on the equipment market. Furthermore, Switzerland's rapproachment with the EC and domestic interests have created greater incentive for deregulation.

UNITED KINGDOM

Status: The Telecommunications industry in the U.K. is a relatively competitive one. Competition exists in both value-added and basic services. The Office of Telecommunications (OFTEL) is responsible for monitoring the liberalized industry structure. The Department of Trade and Industry grants operator licenses. In 1984, the PTT, British Telecom was privatized and became BT. Subsequently, the government granted a license to Mercury Communications Limited (owned by Cable & Wireless) which became the second public network operator and which competes with BT for the inland and international voice and data traffic. Kingston Communication (Hull) plc is the licensee which provides services in the Kingston-upon-Hull region. BT, however, remains the dominant provider of basic telecommunication services. Leased lines, domestic and international, are allowed to interconnect with the PSTN even for voice services. Third party traffic on leased lines is also permitted without restrictions. In analog mobile communications, BT, has a majority interest in Cellnet which controls less than 50% of the market. The other competing cellular operator is Racal Vodafone which is supported by Mercury Communications.

Trends: It is probable that a third public switched network operator will be licensed soon. Since 1990, resale of leased lines has been possible and resale of data services is forthcoming. Under EC Directives the U.K. is deregulating data services and VANS. Plans are on the way to provide equal access and number portability among compatible operators; a process which would allow customers to change network operators without changing their telephone number. Finally, digital mobile service (GSM) is expected to be launched by the end of 1992.

Sources: Northern Business Information, OECD, PTT Netherlands BV.

Appendix Figure 3.A
Level of competition allowed in the provision of telecommunications network infrastructures

Country	PSTN Competition			Data comms leased line		Mobile comm. cellular			Liberalization
	Local	Trunk	Intl.	X25	LLs.	Analog	Digital	Paging	Index
Austria	M	M	M	M	M	M	M	M	0
Belgium	M	M	M	1993	M	M	M	M	0.5
Denmark	n	M	M	1993	M	M	D	M	2
Finland	1993	1993	M	C	C	D	D	D	8
France	M	M	M	1993	M	D	D	D	3.5
Germany	M	M	M	1993	M	M	D	1993	2
Greece	M	M	M	1997	M	n	1993	M	1
Iceland	M	M	M	M	M	M	M	M	0
Ireland	M	M	M	1993	M	M	M	M	0.5
Italy	M	M	M	1993	M	M	1993	M	0
Luxembourg	M	M	M	1993	M	M	M	M	0.5
Netherlands	M	M	M	1993	M	M	1993	M	1
Norway	M	M	M	1993	M	M	D	1993	2
Portugal	B	D	M	1997	B	M	D	M	3
Spain	M	M	M	1997	M	M	M	C	2.5
Sweden	C	C	C	C	C	C	C	C	15
Switzerland	M	M	M	M	M	M	M	C	2
UK	C	C	D	C	C	D	C	C	14

Key:		Liberalization Index:	
C	Competition	2	
PC	Partial Competition	1.5	(limited to certain areas)
D	Duopoly	1	
RD	Regionalized Duopoly	1	
B	Competition allowed at the border of concessions	0.5	
199x	Competition expected to be introduced during this year	0.5	
M	Monopoly	0	16 = most liberalized
N	No service	0	0 = least " "

Source: This figure is a modification of Figure 4 from the OECD Working Party on Telecommunication and information Services Policies: The 1992/93 Communications Outlook.

Appendix Table 3.B(1)
Regulatory Status of Telecommunications Services in EEA

Definitions:
BNS = Basic Network Services
ANS = Alternate Network Services
EEA = European Economic Area (EC+EFTA)

PSDN projections include X.25 revenues for PTOs only.

* fax/data over the PSTN open to competition by 1995.
** liberalized in Germany in 1991.

BNS	**1990**	**Assumed 1995**
PSTN*	Closed (except S, UK)	Closed (except S, U
ISDN	Closed (except S, UK)	Closed (except S, U
Telex	Closed (except S, UK)	Open (except S, UK)
Teletex	Closed (except S)	Open (except S)
CSDN	Closed (except D, S)	Open
PSDN	Closed (except D, E, L, S, UK)	Open (except G, P)
Private Circuits	Closed (except S, UK)	Closed (except UK,
ANS		
Cellular	Closed (except D, SF, F,S,UK)	Open
Paging	Closed (except E, SF, F, S, CH, UK)	Open
Trunked PMR	Open in F, NL, UK (closed D** where only one service existed) no service elsewhere	Open
Telepoint	Open in UK, no service elsewhere	Open
Mobile Data	Open in UK, no service elsewhere	Open
Satellite Bus. Services	Closed (except D, F, UK, P)	Open
VAS	Open	Open

Appendix Table 3.B (2)

The Opportunities for Competition in European Telecommunications
EEA Total Services Market

	1990		1995	
Service	**ECU M**	**%OPEN**	**ECU M**	**%OPEN**
PSTN	72837	25	89315	19
ISDN	99	30	2194	22
Telex	1011	15	583	100
Teletex	90	0	75	100
CSDN	291	69	304	100
PSDN	1784	53	3142	98
Analogue Private Circs	2545	28	3069	25
Digital Private Circs	2932	39	7048	28
TOTAL BNS	**81590**	21	**105731**	23
Cellular	3914	78	8875	100
Paging	425	76	740	100
Telepoint	0	-	205	100
Trunked PMR	30	100	195	100
Mobile Data	5	100	95	100
Satellite Business Srvcs.	110	100	445	100
TOTAL ANS	**4484**	78	**10555**	100
BNS & ANS	**86074**	24	**116286**	30

Source:CIT Research