

The Aftermath of Entry

MARK A. JAMISON

Introduction

Dr. Wilbur Jung, Chairperson of the Economics Department at the University of Europe, has been commissioned by the Legislature of Tonky to make recommendations on competition and deregulation of Tonky's telecommunications industry. Tonky's incumbent telecommunications company, Telephone and Telegraph (T&T), is pressing the government for deregulation. Tonky's telecommunications law allows the sector regulator, the Independent Regulatory Commission (IRC) to ignore any of its statutory obligations that the IRC believes are either no longer needed or are hindering competition. Not surprisingly, T&T's rivals are asking for more regulation if the incumbent. They claim that T&T has hindered their entry by delaying interconnection, providing poor interconnection circuits, controlling rights of ways, delaying the assignment of telephone numbers to the entrants, and making collocation difficult and expensive.

The Legislature turned to Dr. Jung for his advice for two reasons. First, the Legislature wanted to make sure that its consideration of the issues was fair and impartial and that all parties felt that this was indeed the case. Dr. Jung is well respected for his unbiased, substantive research and was an easy choice for this project. Second, the government has limited staff resources and having an expert advisor would give the government information, insights, and international best practices that it would not be able to obtain on its own.

The Legislature asked Dr. Jung to answer the following questions:

- How can policy makers know whether competition in a country is sufficient to regulate market conduct? What government actions are needed to reach the point where competition can serve as the regulator?
- As competition develops, how should regulation change? If regulation of prices is needed, should it focus on interconnection, retail services, or both?
- What regulatory rules, if any, are necessary even after markets become competitive?
- What monitoring devices, if any, should regulators use to know how markets are performing even if the markets are unregulated?

As Dr. Jung begins his study, he finds that these issues are controversial in almost every country. US experts have sharply disagreed over whether regulation hinders competition or is needed to open markets. (See Exhibit 1.) Recently the US Federal Communications Commission (FCC) Chairman announced his belief that deregulation was necessary for competition to develop. Should Dr. Jung consider the US approach best practice or something to be avoided?

Regarding the European situation, with the exception of the UK, the member states of the European Union (EU) only recently liberalized their markets. While there is much uniformity of regulatory policy in the EU states, the member states vary considerably in how they implement these policies and there are large differences in their results. Which countries provide the best insights into the path that Tonky should take?

Dr. Jung found only limited information on developing country experiences, but the experience of Guatemala has stood out to him. Guatemala followed a deregulatory approach and has obtained good results. Was deregulation the key or are developing country markets somehow different?

Background

Telephony was first introduced in Tonky in 1900. In 1930, T&T was formed and it obtained a 30-year exclusive license to provide all telephone services for Tonky. This 30-year exclusive license was renewed in 1960.

In the 1970s and 1980s, new companies began seeking to provide some telecommunications products and services in Tonky. In 1974, Telephone Answering Services Limited began offering paging services, something T&T had no interest in doing. In the early 1980s, customers began buying their own telecommunications terminal equipment. T&T objected, but the government determined that equipment was not telephone service, so T&T's exclusive license did not apply. By the late 1980s, new long distance competitors from the US wanted to terminate international long distance calls in Tonky. At first, T&T resisted and the companies began connecting directly to their large customers in Tonky. T&T found this almost impossible to police, so it agreed to connect with the new US companies. However, this did not stop these companies from bypassing T&T for serving their largest customers.

Tonky refused T&T's 1985 request for an extension of its exclusive license beyond 1990 and took steps to begin opening its markets to competition. T&T had begun offering cellular telephone service in 1986. In 1991 Tonky licensed a second mobile operator and established interconnection charges for of US\$0.09 per minute. In 1993 Tonky issued four mobile licenses for digital mobile service. The T&T and the other

mobile provider obtained two of these licenses and, after a few years, closed their older cellular services. Exhibit 2 shows the growth of wireless services in Tonky. T&T has a 30% market share in mobile telephony.

In 1994 Tonky created IRC to regulate the sector. IRC is responsible for regulating retail prices for wireline services, regulating interconnection prices for all services, and ensuring that competition develops in the sector. In 1995, IRC issued three licenses wireline providers that would compete with T&T – one cable television operator, one state-owned electric utility, and one incumbent operator from another country. The new entrants could not reach interconnection agreements with T&T, so IRC developed interconnection policies and established interconnection prices. Because each competing carrier must have the ability to terminate calls from its customers to its rivals' customers to provide ubiquitous service, IRC required all telecommunications service providers to interconnect. It also required T&T to lease local voice telephone lines and building space to its competitors. The building space was to be used by the entrants for collocation, the situation in which one operator places its telecommunications equipment in the building of another operator. The interconnection prices IRC set were: US\$0.02 for all traffic exchange, including mobile traffic; US\$0.01 for transporting calls between central offices; and US\$10.00 per month for leasing a local line. T&T charges \$15.00 per month for local telephone service in urban areas.

IRC also amended all operator licenses to allow them to provide international calling and mandated full number portability, the situation where a customer can change service providers, but keep the same telephone number. This was implemented in 1997. T&T was designated to operate and maintain the number portability system.

Exhibit 2 shows the status of Tonky's wireline services. Approximately 20 percent of Tonky's

population live in rural areas.

T&T argues that customers have many alternatives to its wireline service and that the alternative providers are growing rapidly. The new entrants point out that T&T still has a dominant market share in all telecommunications services, which gives T&T market power in interconnection. Furthermore, future competition will be for broadband services and T&T has not yet unbundled its broadband services.

Economic Theory

According to William G. Shepherd, an economist at the University of Maryland, there are three primary problems with competition in telecommunications. First, dominant firms control key inputs and can profit from this control even when new entrants are more efficient than the dominant firm is. Second, incumbents generally have an information advantage over customers, regulators, and rivals. Lastly, dominant firms can hinder entry by strategic price discrimination. Michael Katz, former chief economist at the FCC, adds that it may be more economical for an incumbent to create barriers to entry than for an entrant to overcome them. If the incumbent succeeds in protecting its markets, it continues to receive its regulated monopoly profits. If the entrant succeeds in overcoming the barriers to entry, it can expect no more than the profits allowed by a competitive market.

Roger Noll of Stanford University has researched several complications in telecommunications competition. Robert McNary, also of Stanford University, summarizes Noll's research as follows: "In the case of network industries, such as telecommunications, a firm with market power can easily foreclose potential competitors by refusing to allow interconnection. In addition, even though short-run marginal costs approach zero in telecommunications, dominant firms may engage in predatory pricing by substituting longer-term

capital investments for variable inputs."

"Regulation itself plays a primary role in facilitating vertical foreclosure. A regulated monopoly creates opportunities for the transfer of market power in regulated markets to affiliates in unregulated sectors. Long delays in regulatory and legal proceedings impose significant entry costs for potential competitors.... Similar issues arise when regulators and the incumbent firm negotiate quality of service and pricing regulations."

"Also common is the cross-subsidization of excess profits from a monopolized market to a vertically related competitive market. Such cross-subsidies may be exploited through the unnecessary bundling of products and services. Again, passive regulation may exacerbate the situation, as firms may increase profits by allocating costs from unregulated markets to regulated markets."

Roger Litan and Noll have also outlined technology barriers that entrants from other industries must overcome to compete for voice telephony (Exhibit 3).

Robert Harris, Jeffrey Kraft, and Alfred Kahn emphasize the importance of deregulation to foster competition. According to their research, regulation hinders competition by protecting new entrants that are inefficient, hindering incumbents from aggressively lowering prices and creating new products, and hindering incumbents from entering new markets where they might increase competition. Protecting inefficient entrants from incumbents harms customers in two ways. First, the inefficient entrants raise industry costs, which wastes resources. Eventually, these entrants will leave the markets and their customers will suffer the costs of changing service providers. Second, market prices are kept artificially high for consumers and they do not benefit from competition. Restricting incumbents from creating new products and entering new markets also harms customers. Customers are denied the opportunity to purchase products that would increase the value

they receive from communications. Consumers are also denied the lower prices and greater efficiency that could result from more intense competition in other markets that incumbents might enter.

Telecommunications Policy in the European Union States

Liberalization came to Europe because of pressures from liberalized national markets such as the UK and the US. The first liberalization efforts came in 1984 with an action program that began the process of harmonizing markets. The 1987 Green Paper began a process of EC Directives focusing on open network provision (harmonization of interconnection between borders), terminal equipment, standardization, and mobile communications. The directives sought to create a framework for effective competition in selected segments of the telecommunications sector. However, from 1988 through 1993, voice telecommunications and the public telecommunications networks, which accounted for up to 80 percent of the incumbent operators' revenues, were generally protected from competition. This changed in 1993 when the decision was made that member states should fully liberalize their telephony services by January 1, 1998. Exceptions were made for Luxembourg, Greece, Ireland, Portugal, and Spain. Before liberalization, the national markets were served by state-owned monopolies that dominated all fields of telecommunications services – fixed line service, mobile service, and customer equipment. Today member states are either privatizing, or have privatized, the state-owned operators, and have allowed entry in all markets.

Since the early 1990s, European carriers have made progress on rebalancing their prices. Rebalancing prices means that local line rental prices cover the cost of providing a telephone line. Traditionally, these prices were below the cost of a line and long distance prices cover the deficit.

Exhibits 4 through 7 show numbers of interconnection agreements, interconnection prices, market shares in fixed lines, and numbers of operators with wireless local loop licenses for 1999 and 2000.

The UK Experience

The UK was the first European country to liberalize telecommunications. Prompted by British Telecom's (BT's) poor efficiency and poor service quality, the UK opened its market to limited competition in 1984, allowing a duopoly between Mercury, the entrant, and BT, the incumbent, until 1991. The UK regulated BT using price cap regulation and required BT to provide universal service, interconnect with Mercury. During the duopoly period, Mercury gained a 6 percent market share in the domestic long distance market, an 11 percent market share in the international long distance market, and effective no market share in the local line market.

Unhappy with this result, the UK opened its market to additional competitors. By 1995, BT still provided 89 percent of the local and domestic long distance calls, 70 percent of the outgoing international calls, and 89 percent of the value added services in the UK. In 1995, UK cable television service providers began bundling their television services with voice telephone service and gained about 50,000 customers their first year of operation. By the end of 1996, they had 1.6 million television subscribers and 2 million voice telephone subscribers. By the beginning of 2000, BT's share of the local line market had dropped to 83 percent.

The 6th report on telecommunications policy from the European Union (December 2000) had this to say about developments in the UK: "In the last year the UK authorities have taken action in a number of areas. They have introduced an obligation for BT to provide unbundled access to its local loop and facility sharing, and a national

roaming licence condition to help level the playing field for the third-generation new entrant to the mobile market. OFTEL (the UK regulator) has also made an important Determination concerning the provision of a flat-rate Internet access call origination product (FRIACO), in order to allow other operators and ISPs (Internet Service Providers) to compete with the incumbent in providing flat-rate packages for Internet access.”

“170 operators now offer public voice telephone. The incumbent’s market share (by revenue) has continued to decline: to 68.4% for all calls in 1999/2000 (down from 71.2% in 1998/1999); 73.4% for local calls at end 1999/beginning of 2000; 65.0% for long-distance calls in 1999/2000; 49.4% for international calls in 1999/2000; and 36.1% for mobile telephony at end 1999/beginning 2000. Fixed tariffs have fallen since last year. The average monthly bill for national voice telephony (residential users) had decreased by 4.8% in 1999/2000. In the same period the average cost of an international call fell by 36%. Mobile penetration has increased substantially during the past year, and in August 2000, reached 54%.”

The Finish Experience

Finland began gradually opening its markets to competition in 1987. All monopoly rights were eliminated that year, but entry was limited by licensing requirements. By 1994, all markets were subject to at least some competition. At that time, according to a study by the Finish government, prices had decreased about US\$346 million (measured in annual sales).

Finland was different from other European countries at the time it liberalized its markets. It already had several local line operators and a national long distance operator, Telecom Finland. Within a year after market liberalization, an association of local line providers had gained a 51.6 percent market share in domestic long distance and an 18.3 percent market share in

international long distance. Telecom Finland maintained a 73 percent market share in international long distance.

The 6th report on telecommunications policy from the European Union (December 2000) had this to say about developments in Finland: “Finland has a light regulatory regime and the hands-off approach generally followed by the Finnish authorities places greater emphasis on market forces than on detailed regulation to ensure the operation of an effective communications market. However, some new regulatory initiatives have been launched since the 5th Report, notably proposed amendments to the Telecommunications Market Act to provide for shared access to the local loop, collocation, and national roaming between third and second generation mobile networks. Consideration is also being given to revising the legislative framework for communications to reflect the process of convergence and to ensure technological neutrality.”

“New entrants still argue, however, that the lack of detailed regulation in certain areas, particularly in relation to cost accounting and pricing issues, perpetuates a lack of transparency and accountability on the part of the incumbents and deters market entry, especially in the local market.”

“Although the Finnish market for local fixed telecommunications has historically been segmented, with each area having their (sic) own local operator, a process of consolidation is under way, as can be seen from the emergence of Elisa Communications Corporation (formerly the Helsinki Telephone Corporation) as a major national operator, whose interests include nearly 100% ownership of the second largest Finnish mobile operator, Radiolinja.”

The US Experience

The US Telecommunications Act of 1996 (1996

Act) made allowing competition in almost all telecommunications markets a national policy and provides three methods of entry for local telephone service. Some entrants use more than one method. Entrants can build their own facility-based network, lease portions of an incumbent local exchange company's (incumbent) network, or buy an incumbent's services and resell them. The 1996 Act requires incumbents and entrants to interconnect their networks to exchange calls. Payment for exchanging calls is called reciprocal compensation in the US.

Leasing portions of an incumbent's network is called purchasing unbundled network elements (UNEs). Entrants that have their own switches must interconnect their switches with those of an incumbent and pay reciprocal compensation for terminating telephone calls on the incumbent's network. Likewise, an incumbent must pay reciprocal compensation for terminating calls to an entrant. The 1996 Act states that prices for UNEs and for reciprocal compensation are to be cost-based, which regulators have generally concluded means that they should be based on incremental cost. Reselling is little more than rebranding the incumbent's service. The 1996 Act says that wholesale prices must be based upon retail prices minus the portion attributable to marketing, billing, collection, and other costs avoided by the incumbent when it does not provide the retail service.

Three empirical studies have examined the development of competition in the US. In a January 2000 study, Karl McDermott and Agustin Ros of National Economic Research Associates find that competition for large business customers in dense metropolitan areas was beginning to take hold, but that little competition existed for smaller business customers located in non-urban, rural areas and residential customers. They conclude that, in their pursuit of universal service and fully exploiting the positive network externalities present in telecommunications, US policymakers historically priced residential local telephone

service below its economic costs. Business and long distance services were used to subsidize these prices. Their empirical study concludes that these inefficiently set local exchange prices hinder the development of residential competition.

In an October 2000 study, Gregory L. Rosston and Bradley S. Wimmer of Stanford University examine how the relationship between local telephone prices and estimates of the cost of providing services affect entry. They find that large amounts of cross subsidy still exist in local telephone prices in the US and that these subsidies large differences between revenues and costs attract competitors. They conclude that "(t)hese results suggest that regulators are having a large impact on the development of competition – attracting competition in some areas, while making entry into many markets untenable.

Exhibit 8 summarizes a PURC study of competition in the US. This paper concludes that incumbents are able to hinder entry when it is more profitable for the incumbent to serve a market itself than to lease local loops to a rival.

The Guatemala Experience

Guatemala enacted its telecommunications reforms in October 1996. Its framework reflected lessons learned from the reforms in the U.S., Chile, New Zealand, and Australia. The underlying principles of Guatemala's reforms were to focus on promoting competition, privatization of dispute resolution and spectrum management, limited regulation, and direct subsidies and elimination of cross-subsidies.

Guatemala had extensive interconnection requirements. It forced the leasing of unbundled network elements and resale of services. It also concluded that the right interconnection for terminating calls or to originate a call. The connection must be offered at all feasible levels and prices must be based on incremental cost. If

disputes arise on interconnection, or access to other essential facilities, an alternative mechanism for dispute resolution was devised. Connection charges must be registered with the regulator, are made are public, and are available to any other party on the same basis.

Guatemala also required dialing parity, i.e., all networks must be accessible under similar terms. Number portability, the ability of a customer changing networks to keep the same telephone number, was also mandated.

Unbundled access was a temporary measure that applied for only three years. It required the incumbent to offer entrants basic network elements separately at cost. Guatemala believed that this was important to increase the contestability of the market by lowering fixed entry costs. The requirement lasted only three years to give incentives for network expansion.

Radio spectrum management was privatized. Spectrum was treated as private property that could be sold, leased and mortgaged, and fragmented vertically, geographically, and in time. All spectrum transactions had to be registered with the regulator.

Spectrum titles are granted for periods of 15 years and can be renewed. Title was assigned to any

person that requested it unless it is impossible for technical reasons. If others are interested in that portion of the spectrum, then a public auction was carried out. Title was awarded to the highest bidder.

In order to promote service in low-income areas, Guatemala a fund to subsidize telecommunications services in low-income areas. Seventy percent of the proceeds of spectrum auctions financed this fund. Operators wishing to draw from the fund had to submit bids and the firm with the lowest bid won.

The results of the Guatemala reforms have been impressive relative to those of developed countries.

The number of service providers increased sharply. The number of basic telephone service providers increased from one to seven and the number of cellular providers increased from one to three. The number of users also increased sharply. Basic telephony users increased from 250,000 to 600,000. Cellular subscribers increased from 30,000 to 250,000. Prices of local telephone services increased and there were sharp declines in the prices of long distance and cellular telephony.

Long distance rates declined from US\$1.80 a minute to US\$0.30. Cellular rates declined by more than 50%. Exhibit 9 shows a chart of these results.

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Cato Institute Briefing Paper No. 63 May 8, 2001

A 10-Point Agenda for Comprehensive Telecom Reform

by Adam Thierer

Adam D. Thierer, director of telecommunications studies at the Cato Institute, was a member of the Bush-Cheney FCC Transition Advisory Team.

Executive Summary

Changing committee chairmanships in Congress and a leadership shakeup at the Federal Communications Commission have once again opened a window of opportunity for comprehensive telecommunications policy reform. While new faces are taking over within Congress and at the FCC, however, old issues continue to dominate the telecom policy landscape.

This is largely due to the fact that, when Congress last attempted to address these matters five years ago by passing the historic Telecommunications Act of 1996, legislators intentionally avoided providing clear deregulatory objectives for the FCC and instead delegated broad and remarkably ambiguous authority to the agency. That left the most important deregulatory decisions to the FCC, and, not surprisingly, the agency did a very poor job of following through with a serious liberalization agenda.

The Telecom Act, with its backward-looking focus on correcting the market problems of a bygone era, has been a failure. Instead of thoroughly clearing out the regulatory deadwood of the past, legislators and regulators have engaged in an effort to rework regulatory paradigms that were outmoded decades ago. In short, it was an analog act for an increasingly digital world. The new leadership in Congress and the FCC should adopt a fresh approach based on deregulation and free markets.

<http://www.cato.org/pubs/briefs/bp-063es.html>

Unleashing Telecommunications: The Case for True Competition

Brookings Institution Policy Brief #39—November 1998

By Robert E. Litan and Roger G. Noll

Executive Summary

The long-awaited transition to a competitive local telecommunications market is mired in regulatory and court proceedings spawned by the implementation of the Telecommunications Act of 1996 and proposed mergers among major players in the industry. In this brief, we argue that to accelerate development of competition in local access, the recently proposed mergers involving three of the remaining five RBOCs (*Baby Bells*) should be denied; prices for all telecommunications services should be moved toward cost; and requests by RBOCs for authority to offer long-distance service should be denied until there is more progress on making local access more competitive.

<http://www.brook.edu/comm/PolicyBriefs/pb039/pb39.htm>

Exhibit 2. Wireless and Wireline Statistics for Tonky.

Year	Mobile Wireless Subscribers	Fixed Line				High-Speed Lines (all technologies)
		T&T		Entrant-Owned Subscriber Lines	Ported Telephone Numbers	
		Subscriber Lines	UNE Loops Leased			
1984		74,773,962				
1985		77,107,691				
1986	500,000	79,305,176				
1987	883,778	81,864,041				
1988	1,608,697	83,357,744				
1989	2,691,793	85,959,245				
1990	4,368,686	88,472,273				
1991	6,390,053	91,709,097				
1992	8,892,535	93,518,243				
1993	13,067,318	96,583,024				
1994	19,283,506	99,545,503				
1995	28,154,415	103,887,202				
1996	38,195,466	108,615,199				
1997	48,705,553	114,055,047	650,000	NA	80	
1998	60,831,431	118,497,430	1,200,000	NA	445,661	
1999	76,284,753	122,298,744	5,471,000	2,847,000	3,462,812	2,756,492
2000	97,035,925	125,205,500	8,773,000	4,304,000	7,829,561	4,319,365

Exhibit 3. Noll's Advantages and Impediments to Potential Competitors to Voice Telephone Companies

<i>Technology</i>	<i>Advantages/Key Features</i>	<i>Impediments</i>
Cable television	Prematurely promised as the answer to the copper wire, AT&T's proposed purchase of TCI and possible hook-up with Time/Warner	High cost and complication of making cables true two-way means of communication
Wireless (including satellites)	Cellular calls becoming steadily cheaper, number of users sky-rocketing	Cellular calls still substantially more expensive than landline calls; satellite deployment will take time
Electric companies	Electric wires already run into homes and businesses	Coupling the electric wires with switching technologies has not yet been demonstrated
Packet-switching	The new Internet-protocol technology should transmit both data and voice simultaneously, at far lower costs	Takes time for new technology to be implemented

Source: Litan, R.E. and Noll, R.G. "Unleashing Telecommunications: The Case for True Competition," Brookings Institution Policy Brief #39, 1998.

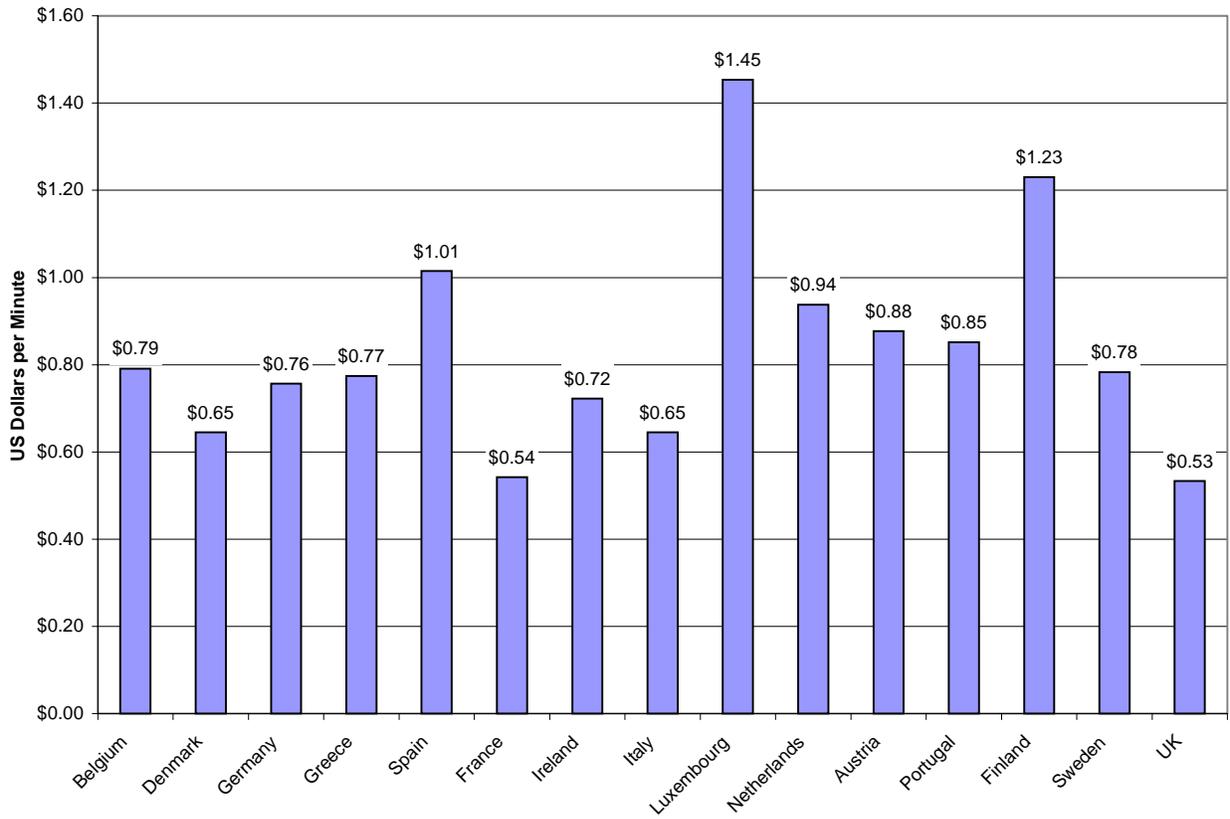
Exhibit 4. Number of Interconnection Agreements in Place for Call Termination on Fixed and Mobile Networks in the EU

	Country							
	Belgium	Denmark	Germany	Greece	Spain	France	Ireland	Italy
Fixed-to-mobile	3	10	4	3	24	13	2	10
Fixed-to-fixed	19	129	117	0	35	200	13	51
Mobile-to-mobile	3	1	NA	3	3	0	1	6
	Luxembourg	Netherlands	Austria	Portugal	Finland	Sweden	UK	
Fixed-to-mobile	5		54	10		11	5	
Fixed-to-fixed	5	63	124	12	184	22	239	
Mobile-to-mobile	1		7	1	3	2	6	

Source: European Union, 2001.

<<http://europa.eu.int/ISPO/infosoc/telecompolicy/6threport.html>>.

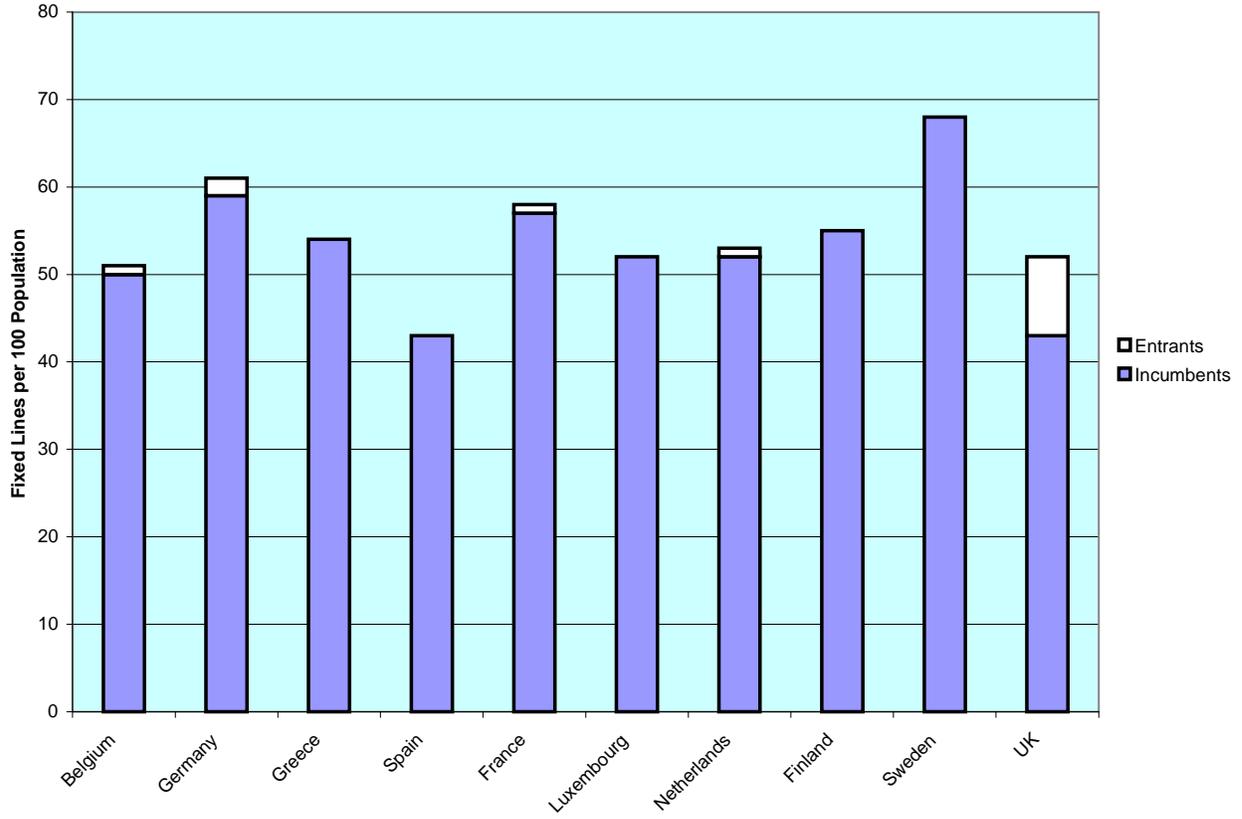
Exhibit 5. Interconnection Charges for Call Termination in Fixed Networks, 2000



Source: European Union, 2001.

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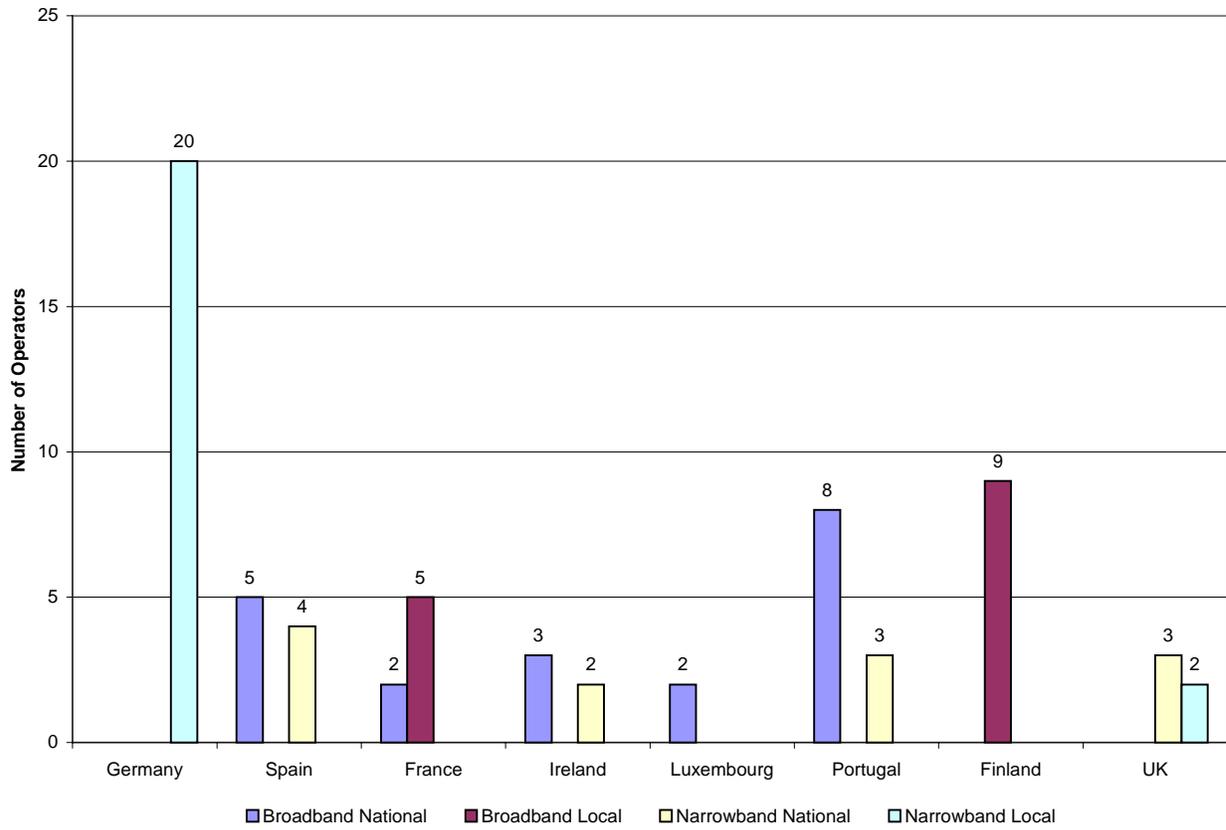
Exhibit 6. Fixed Line Market Penetration by Entrants and Incumbents, 1999 and 2000.



Source: European Union, 2001.

<<http://europa.eu.int/ISPO/infosoc/telecompolicy/6threport.html>>.

Exhibit 7. Number of Operators with Wireless Local Loop Licenses in European Countries, 2000.



Source: European Union, 2001.

<<http://europa.eu.int/ISPO/infosoc/telecompolicy/6threport.html>>.

Exhibit 8. Results of 2000-2001 PURC Study of Competition in the US

Interconnection and Competition in the US

		Interconnection and Competition in the US					
Company	State	Per minute price for a 3-minute call US Dollars	Market Share of New Entrants	Company	State	Per minute price for a 3-minute call US Dollars	Market Share of New Entrants
Ameritech	Illinois	\$0.0083	1.50%	GTE	California	B&K	1.35%
Ameritech	Indiana	\$0.0012	0.97%	GTE	Florida	\$0.0093	0.97%
Ameritech	Michigan	\$0.0034	1.19%	GTE	Hawaii	B&K	1.93%
Ameritech	Ohio	B&K	1.42%	GTE	Illinois	B&K	0.00%
Ameritech	Wisconsin	\$0.0089	0.80%	GTE	Indiana	\$0.0050	0.16%
Bell Atlantic	Washington, D.C.	B&K	1.04%	GTE	Kentucky	B&K	0.21%
Bell Atlantic	Delaware	\$0.0019	0.55%	GTE	Michigan	\$0.0034	0.00%
Bell Atlantic	Massachusetts	\$0.0204	2.00%	GTE	North Carolina	\$0.0110	2.07%
Bell Atlantic	Maryland	\$0.0032	0.65%	GTE	Ohio	B&K	0.00%
Bell Atlantic	Maine	\$0.0197	0.64%	GTE	Oregon	B&K	2.25%
Bell Atlantic	New Hampshire	\$0.0197	0.72%	GTE	Texas	B&K	0.95%
Bell Atlantic	New Jersey	\$0.0036	0.46%	GTE	Virginia	\$0.0069	0.75%
Bell Atlantic	New York	\$0.0073	1.94%	GTE	Washington	B&K	1.25%
Bell Atlantic	Pennsylvania	\$0.0028	1.25%	GTE	Wisconsin	\$0.0198	0.04%
Bell Atlantic	Rhode Island	\$0.0197	0.87%	SBC	Arkansas	B&K	0.79%
Bell Atlantic	Virginia	\$0.0049	0.55%	SBC	Oklahoma	\$0.0120	0.87%
Bell Atlantic	Vermont	\$0.0283	0.57%	SBC	Texas	B&K	1.43%
Bell Atlantic	West Virginia	\$0.0082	0.00%	SBC	California	\$0.0075	1.80%
BellSouth	Alabama	\$0.0100	0.64%	US West	Arizona	B&K	1.40%
BellSouth	Florida	\$0.0013	0.91%	US West	Colorado	B&K	1.59%
BellSouth	Georgia	\$0.0100	1.87%	US West	Iowa	B&K	0.03%
BellSouth	Kentucky	\$0.0036	0.82%	US West	Idaho	\$0.0045	0.49%
BellSouth	Louisiana	\$0.0016	0.24%	US West	Minnesota	\$0.0032	1.30%
BellSouth	Mississippi	\$0.0031	0.21%	US West	Montana	\$0.0066	0.28%
BellSouth	North Carolina	\$0.0130	2.43%	US West	North Dakota	\$0.0043	0.04%
BellSouth	South Carolina	\$0.0028	0.49%	US West	Nebraska	\$0.0056	0.95%
BellSouth	Tennessee	\$0.0190	1.65%	US West	New Mexico	\$0.0008	1.20%
				US West	Oregon	B&K	1.49%
				US West	South Dakota	\$0.0051	0.07%
				US West	Utah	\$0.0043	1.81%
				US West	Washington	B&K	1.64%
				US West	Wyoming	B&K	0.00%

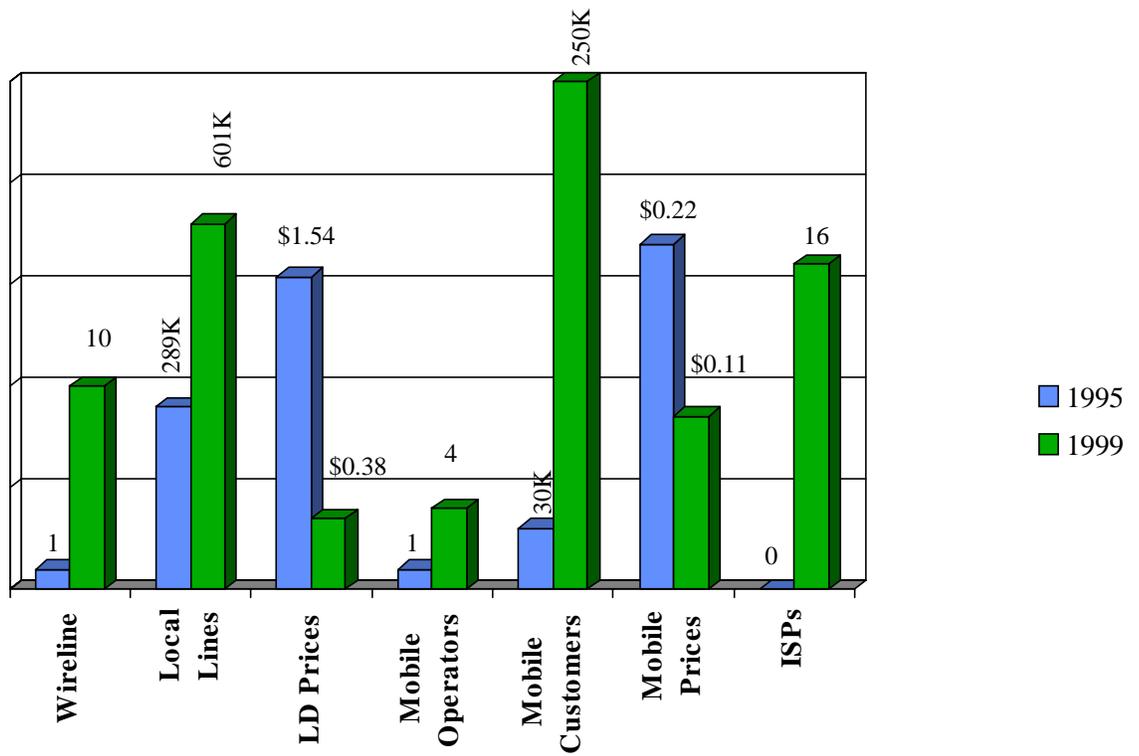
Note: B&K means Bill and Keep

Abstract of Study Findings, by Mark A. Jamison:

The study examines how incumbents and entrants respond to prices for network interconnection in telecommunications. I find that low prices for entrants to lease incumbents' facilities, exchange traffic, and buy incumbents' services for resale increase entry. However, if prices for leasing incumbents' facilities are low relative to incumbents' retail prices, then less entry occurs, presumably because incumbents hinder entry to protect profits. Higher prices for exchanging traffic increase entrants' market share, presumably because they target customers (such as Internet Service Providers) who receive more calls than they make. Low prices for reselling services do not cause entrants to choose reselling over other supply methods.

Source: Jamison, M.A. "Incumbent and Entrant Incentives with Network Interconnection: The Case of US Telecommunications," Mimeo, Public Utility Research Center, University of Florida, 2001. Available at <<http://bear.cba.ufl.edu/centers/purc/primary/Mjamison.htm>>.

Exhibit 9. Chart of Results from Guatemala Telecom Reforms.



Source: Alfredo Guzman, Presentation at the *Latin American Forum on Communications*, University of Florida, 1999.