The Impact of the Privatization Process on the Brazilian Telecommunications Industry

by

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Abstract

This thesis analyzes the effect of the privatization process on the telecommunications sector in Brazil. Given the international characteristic of this industry, this work dedicated great emphasis in understanding what are the main current issues in the telecommunications industry worldwide. Furthermore, it is investigated how other countries approached this major event - privatization and deregulation - of this critical sector for every society. Models and insights were then drawn and adapted to understand the Brazilian specific situation.

It is examined the sector's current situation and its future trends in the Brazilian market after almost three years since the assets were auctioned and transferred to private hands. It is also discussed the potential industry scenarios in each major telecom segment. The conclusion is that a consolidation process is inevitable in order to reach economies of scale and scope in the system and hence guarantee a satisfactory return on the investments to the main players in the market.

Thesis Supervisor: Henry Birdseye Weil
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Chapter 1: Introduction

1.1 Thesis Objectives

The provision of a world-class telecommunications infrastructure and information is recognized for most nations as the key element to a rapid economic and social development of any country. Furthermore, the globalization trend of the world economy has indicated that an efficient telecommunications system is a basic condition for any country that expects to attract foreign investments. In this sense, it is vital for any government to have a comprehensive and forward looking telecommunications policy that creates an enabling framework for the development of this industry.

It was with these concepts in mind (and due to a lack of resources to invest in an already outdated and inefficient telecommunications system) that the Brazilian government auctioned its assets in the sector in July 1998, transforming a gigantic state owned monopoly in a private and competitive sector, disputed by some of the major international telecom companies.

The objective of this thesis is to understand the profound transformation occurred in the Brazilian telecommunication industry since the event of the privatization, and to analyze the implications of this transformation for the future of the industry in the country. It is also an objective of this work to present the potential competitive scenarios in each major telecom segment, defining the current situation and providing the most likely future outcomes in each market.

1.2 Scope and Methodology

Given the globalization fashion of the telecommunications industry, the second chapter of this work is dedicated to outline and explore the main current issues in the sector; and to describe what are the implications of these questions for the competitive environment. This chapter also analyses the existent regulatory frameworks and the processes for privatization, liberalization, and deregulation in this industry.

Chapter 3 deals with cases studies. The privatization events in England and Germany are discussed aiming to establish common points and implications of these processes for the Brazilian case. Additionally, it is analyzed some particular issues that developing countries face when they decided to privatize their telecom systems. Questions like the lack of an established infrastructure, huge necessity of investments, explosive market growth after privatization due to unattended demand are some of the specific concerns in these countries that are not encountered in the same intensity in the developed markets.

In the chapter 4 is synthesized the recent history of the telecommunications industry in Brazil. Starting from the establishment of the Telebras system in the seventies, understanding the deterioration of the sector during the two next decades, and culminating with the privatization in 1998, the chapter provides a brief historical background that helps to understand the current situation of the sector. Additionally, the post-events of the privatization and the initial outcomes are detailed and analyzed.

In the next chapter the current situation of the Brazilian telecom industry is carefully investigated, given the imminence of a second wave of restructuring with the opening of all telecom markets to full competition. The chapter analyzes the competitive scenario in each major telecommunications segment: fixed line, wireless, Internet, and data transmission; and provides an evaluation in terms of most likely movements for the fixed and wireless players in each of the these markets.

The conclusion chapter delineates the strategic options for the major players and establishes a framework that helps to explain why consolidation and value creation will possibly be the main concerns for the carriers in the near future.

The methodology for this work was mostly based on the comparisons between the privatization and liberalization processes early occurred in developed and emerging markets. Models and insights were then drawn and adapted to understand the specifics of the Brazilian market. Evidently, the sector's current technological status and the globalization stage of the world economy were also taken in account when delineating and exploring the Brazilian case.

The research was based on industry reports, recent books, and theses. Some informal interviews were also carried out with some industry experts in the Brazilian market. The foremost objective of these interviews was to test the main hypotheses derived for the future competitive scenarios of the telecommunications industry in the country.

Chapter 2: Industry Structure and Privatization Models

2.1 Strategic importance of the sector

Telecommunications is not only important as a communication medium, generating income, jobs, and related services. It is also a vital infrastructure component, serving as a support or background for the development of several others economic sectors in every country. The industry's widespread transmission networks and the relatively inexpensive, reliable services that telecommunication companies provide make them indispensable to the development of any economy.

Telecommunications allows for the efficient exchange of ideas and data, offers ease in conducting complex businesses and commerce, and generally serves to keep society cohesive. Moreover, telecommunications channels have been considered as important issues for national sovereignty, and a key strategic resource in periods of society disturbance like wars and civil rebellions [1].

Not surprisingly, given its strategic importance, telecommunications have been considered in many countries as a "natural monopoly" and, coupled with security and redistributional considerations, have kept monopolies under state-run management until very recently. This situation has provoked massive damage to the society in many countries, given the bad management and the political manipulation of such important sector by the government and their allies.

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1 Rocha, E. and Bakis, H. Developments in telecommunications. Ashgate Publishing Company, 1997.

2.2 Basic Model: How the industry works

2.2.1 From Natural Monopoly to a Highly Competitive Market

The idea of the "natural monopoly" applies for an industry in which no combination of firms can produce an output as cheap and as efficient as a single supplier can provide it. For a long time this concept perfectly matched with some intrinsic characteristics of the telecommunication industry. Economic principles associated with these characteristics were put into effect in the early stages of the industry and led naturally to the private and state monopolies that were common until twenty years ago.

One of the most important aspects of the sector is that it is marked by extremely high initial costs to achieve installation of the network and the investment does not ensure immediate profit. In other words, both investments and risk are too high and the payback period is very long, not surprisingly the free entrance of competition is discouraged. Furthermore, until recent past, and given the technology *status quo* at that time, it was believed that only a monopoly could achieve maximum economic efficiency by exploiting three kinds of economies that fitted very well with the sector: economies of system, economies of scale, and economies of scope [(2)].

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2 Melody W., Telecom Reform: Principles, Policies and Regulatory Practices. Technical University of Denmark Press, 1997.

Economies of system is linked with the primary idea that a telecom system had to be as large as comprehensive as possible in the geographical sense, and its integration should be centrally coordinate in order to guarantee smooth operation. [3]Essentially, this kind of economy would prevent technological incompatibilities and/or redundancies.

Economies of scale refer to a situation where the cost of production decreases when the volume of production increases. For the telecommunication industry the parallel is immediate: the provision of a telecom service would be cheaper as more users join the system. Therefore, under the monopolistic point of view, competition should be discouraged in order to reduce the companies' per user cost.

Economies of scope were another belief in favor of the so-called natural monopolies. It is basically similar to the idea of economies of scale, but it was used to indicate that a provision of two or more products or services under the same platform is cheaper and thus, again, competition was not a good idea - for the monopoly, of course, but also for the society that would be better of by having only one telecom service provider. Under these circumstances, monopolies bundled services and products, and were able to make the overall production economically efficient, simply because the production and distribution of different assets was based on the same equipments and on an already existing technical infrastructure. For instance, when the same line installed for telephony is used to offer fax services, the investment for the fax decreases to zero, while the revenues stream is boosted.

Another interesting justification for the natural monopoly was wrapped under the altruistic defense of the "universal service". The idea of universal service is to make telecommunication services available to everyone, with no groups excluded due to unreasonable prices. The monopolies encompassed this social flag by using two questionable practices: cost averaging and cross-subsidy.

Cost averaging was used to bring balance, for instance, between the low cost of providing telephony services in densely populated urban areas and the high cost of providing and maintaining the same level of service in the less populated rural areas. Cross-subsidy has a slightly different meaning, although the two procedures have the same objective. Cross-subsidy is more related with financing a loss-making line of business with profits made from other products/services.

Things dramatically changed in the last two decades. All of these economic principles that helped support the concept of natural monopoly suddenly started to work against it, and one can say that the drive force behind this transformation is the technologies advances in the sector. The telecom sector is now one of the most dynamic and active areas for privatization and competition, driven mainly by the increasing awareness that information technology is a key factor in socio-economic modernization.

Technological innovation and governmental deregulation have triggered an array of changes in this industry. Closely linked with the computer industry, break-throughs in telecommunications technology are occurring at a pace comparable with that of computers. A number of innovations are related to the Internet, which impacts and is a product of both industries. Fiber optics allows telephone and cable companies to serve

customers more efficiently and to offer an array of new services. Wireless communication is becoming commonplace not only in the US and Europe, but also in developing countries of Latin America and Asia. In fact, in the emerging economies wireless is turning to be an alternative to wireline services. Also, television stations is debuting digital transmission, promising to provide viewers with excellent quality reception.

Perhaps even more profound than the technology revolution is the recent deregulation of telecommunications, opening up literally a world of new opportunities. In the second half of the 1990s, several country members of the World Trade Organization terminated their state-run telecommunications monopolies by opening their markets to foreign and domestic competition. Within the U.S., the Telecommunications Act of 1996 broke the barriers between local telephone, long-distance telephone, and cable markets by allowing those companies to operate in each other's arenas. Not only are these players capitalizing on their strengths to develop new technologies, many are also starting to offer a combination of services to customers, providing them with "one-stop shopping" for all of their telecommunications needs.

2.2.2 Current Issues Under the Competitive Environment

The technological changes that transformed the telecommunication industry over the past two decades dramatically reduced the barriers to entry and fostered all kinds of competition.

New entrants came basically from three directions [3]: some players decided for building their own networks to compete against the incumbents; others have found ingenious ways to use infrastructure leased from other businesses. And some are using new kinds of infrastructure, mainly cable television systems and the wireless spectrum. The effect everywhere is the same: to drive down prices and expand the range of services.

In fact, new technologies and a growing number of competitors are driving down many of the elements in the cost of a telephone call. The marginal cost of carrying an additional call is now so small that is almost insignificant for the service provider. More important, distance no longer matters and the intrinsic cost of calling a neighbor or someone else in other side of the globe is virtually the same. As pointed out by Frances Cairncross [4] "the death of distance as a determinant of the cost of communicating will probably be the single most important force shaping society in the first half of this century. It will alter, in ways that are only dimly imaginable, decisions about where people work and what kind of work they do, concepts of national borders and sovereignty, and patterns of international trade."

This phenomenon of death of distance is closely attached to the fact that in most of the developed countries telecommunications capacity shortages, so common in the past, no longer exist. This increased capacity is essentially due to the massive use of fiber optic cables (replacing the old and saturated copper cables), and due to new type of switches (telephone exchanges), no longer based on electro-mechanical devices and human operators.

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3 The Economist Survey Telecommunications, September 30th, 1995.

The result is impressive, costs fell significantly and nobody else can envision that we will ever experience again capacity constraints in telecommunications.

The implications of these changes from the business perspective are enormous and they are changing completely the business models long developed by the telecom industry. Basically, the carriers now have to offer the same product at a small fraction of their former price, and yet the investments to reach this new technological stage are enormous with payback periods much longer than they were used to have. Operators everywhere are struggling to find ways to add value to the basic telephone call, but prices are likely to fall more quickly than premium products can be marked. As one can notice, suddenly telecom carriers had to abandon their business models based on utility providers in an industry characterized by stability, protectionism, and high margins; and embrace new ones, more concerned with competition, new products and services, and customer acquisition and retention.

Therefore, one can imagine that the issues currently faced by the telecommunications industry are completely different from the ones faced in the past, where the "natural monopoly" was the rule. Yet some of the industry basics still persist, such as economies of scale and scope, initial high investment costs, etc, and consequently, some issues are still the same. The following table shows the most important questions that are in the mind of the whole industry and, as one clearly can see, the main issues evolve around the competition between incumbents and new entrants. In this sense, governments, through its regulator role, is a critical player

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4 Cairncross, Frances. The Death of Distance. Harvard Business School Press, 1997.

aiming for consumer protection by fostering competition and setting minimum quality level for the services provided by the operators.

MAIN ISSUES	REASONS FOR IMPORTANCE
Pricing and excess capacity	New pricing models; new type of competitors
Cable network	Competition against local carriers
Virtual Competitors	Trade of excess capacity based on supply/demand
Local loop competition	Last mile and competition with local carriers
Globalization and Integration	Size and bundling versus unbundling issues
Internet	Traffic generator and substitute for the existent telecom players
Wireless	New value added services and competition against fixed lines
Technology convergence	Integration of computer and telecom technologies
Future Value Chain	Disintegration and re-integration based on specialization

Table 2.1 – Main current issues in the telecommunications industry

2.2.2.1 – Brief Discussion on the Main Issues

In this section the issues mentioned in the table 2.1 and their implication for the telecommunication industry will be further developed in order to show their interdependence and their roles in shaping the future of the sector.

2.2.2.1.1 - Pricing and excess capacity

As mentioned earlier, technological advances, and the increased number of competitors in this industry dramatically drove the prices down. Questions about the pricing model long adopted by the industry based on the use and distances involved arose in the market, given the fact that many parts of the network are no longer constrained by capacity. Moreover, cross-subsidies are still a common practice, where domestic telephone users are subsidized and businesses overcharged. Long-distance and international calls, where tariffs have long been kept deliberately high, also subsidize local calls - that are free or extremely cheap in many countries. Pressures are growing against the incumbents and new competitors are moving to a simpler pricing model, based on a regular fee function of the speed and capacity of the line, and additional charges for value added services.

2.2.2.1.2 - Cable network

Cable – provide by cable television operators – has the benefit of bandwidth, and the possibility of running telephony services on the already existent backbone. Therefore, they are considered new entrants in the telecom industry with some very

good reasons to believe that they can succeed in this market. First, bandwidth allows them to aggregate value added services such as videoconferences, faster Internet access, etc. Second, since they have already laid the network and there is excess capacity, the cost for carrying telephony services is very low. Finally, there are some clear synergies in bundling the two businesses, such as higher customer retention rates, only one billing, etc. Evidently, this possibility of offering telephony services only makes sense in countries that have high cable TV penetration rates like, for instance, in the United States. Still, these companies face a big obstacle, which is their fragmentation. In most countries, cable TVs operators are very small when compared with the local carriers, and they do not have brand name recognition.

2.2.2.1.3 - Virtual competition

As mentioned earlier, the excess capacity in the telecom sector, especially in markets where broadband is already a reality, is leading to the development of a new business model: the online bandwidth exchange. Companies in this field are called "networkless", and they act as third-parties brokers. Ultimately, they seek to create a market where buyers and sellers of bandwidth trade segments of capacity on equal terms, thus minimizing the complexity of negotiating delivery, availability, and costs. Not surprisingly, the result from these trades is driving telecom prices down, by making traders in near-real-time effectively buying and selling capacity to reflect the supply and demand at a given moment. The great majority of these intermediaries companies do not offer telecommunications services themselves, but rather they are selling capacity and minutes from participating carriers. The great irony in this situation is that the

existent telecom operators, by selling their excess capacity under a "marginal revenue logic", are in the long run inexorably driving down the price of the entirely telecom sector. In fact, the brokers present compelling data pricing, discounted as much as 90% over retail prices. These companies typically charge a commission for each successfully completed transaction, which ranges from a fixed rate of two cents per minute for circuit-switched minutes, to about 2% of the entire purchase for dedicated bandwidth [5].

2.2.2.1.4 - Local loop competition

The emergence of optical networks and digitalization has already impacted profoundly the long distance side of the telecommunication networks. The next major step has been to link these networks to the local loop – the connection between the nearest exchange and the subscriber's home. This connection usually is made with a pair of copper cables and, therefore, cannot benefit from the advances in the digitalization such as speed, quality of transmission, and cost reduction. Two less expensive and more flexible alternatives to copper have now become available. One, as mentioned earlier, is to run telephone services over the same system as cable television. The problem with this alternative is that cable networks usually are not pervasive enough, involves high fixed costs and passes homes that do not want them, as well as homes that do so. Additionally, building them from scratch (as in England) can be very expensive.

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5 Internetnews.com. Enron Opens Bandwidth Commodity Trading Service. March 12, 1999.

The other alternative can be considered a technological breakthrough: the use of wireless transmission. Its extraordinary flexibility and low cost will allow the development of a new kind of network competing directly with fixed wires. But the most important aspect of this innovation is the possibility of replacement of the old analog lines for a digital wireless linked to a small fixed radio antenna in the home, which can make extraordinarily efficient the use of the radio spectrum - unlike a mobile phone, the antenna is always tuned precisely to the correct base station. Furthermore, wireless is cheap – an analysis made by the management consulting Booz Allen & Hamilton revealed that the required investments are between US$800 to US$1300 per subscriber line and falling, compared with around US$1700 for fiber deployment [6]. Still, a major part of the investment (the subscriber transceiver) is variable, incurred as customers sign up, and maintenance costs are lower for wireless than for wireline.

2.2.2.1.5 - Globalization and Integration

Until recently, it was believed that the bigger was the better for telecom carriers. They believed that huge scale and vertical integration would be critical advantages in the battle against small competitors, and that their "size" would help them to dictate the pace of technology change. In fact, the last decade saw the emergence of big worldwide telecommunications company as a consequence of three major factors: the liberalism and market opening, specially in America and Europe; the arrival of the Internet with its intrinsically sense for globalization leading to a new platform for

6 Booz Allen & Hamilton. The "Last Mile" Dilemma: Strategies in the Local Loop. www.bah.com.

business and consumer behavior, resulting in a explosion of data traffic and new services; and thirdly, the acceleration growth of mobile telephony opening opportunities to the existent players to expand their core capabilities and seize the moment. Ultimately, the operator's strategy is to serve as one-step supplier of telecommunications services so that global clients do not have to enter into separate agreements in different countries or regions. By offering seamless telecom services and thus reducing tremendously the transaction costs for the clients, the carriers believed that they could lock-in their corporate clients and extract afterwards surpluses from this client dependence situation.

However, what is happening is quite a different story: the cheap bandwidth and the spur to competition from liberalization transformed the business, especially traditional voice telephony. As highlighted by The Economist [7], as the integrate carriers' core business declined, they also discovered that the financial markets are no longer, as they once were, excited by the possibilities of bundling their array of voice, corporate data, wireless and consumer broadband services. Instead, the fashion has switched in favor of highly focused "pure plays" such as wireless companies, web-hosting specialists and against the telecom "holding companies". The consequence of these trends was rapidly noticed – giants like AT&T, BT, and WorldCom announced (and some already put into effect) businesses disaggregations through spinouts and independent business units' creation.

2.2.2.1.6 – Internet

The "international network of networks", which connects over 35,000 different networks is often touted as the precursor of the global information infrastructure as it has seen nowadays. One important aspect of the Internet for the telecommunication field is its ability to carry voice and data over its network of computers. Internet telephony has evolved over the last few years from a service that was available only to similar equipped computers, to a service that would call from a computer to any telephone or fax machine, and finally to the possibility of making calls from telephone to telephone, routed via the Internet, but originated and terminated on the carriers' network. The impact of this new technology on the telcos' revenues streams can be very significant. Therefore, the carriers that initially had seen the Web as a new traffic generator – since the user has to connect on a telephone line to gain access to the Web – are now seen the Web as a real threat to their businesses, especially in the domestic long distance and international calls markets. In fact, despite its still low quality voice communication, a Jupiter research [8] conducted in 1998 has shown that 64% of consumers would be willing to accept this lower-quality voice service if it were priced 50% below existing phones rates. This is a clear indicative of the price elasticity in the consumer telecom market and bodes well for IP telephony service provider. Even worse for the traditional carriers is the fact that the technology is continuously evolving, and it only can get better over the next years.

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7 The Economist. Survey Telecommunications. September 30th, 1995.

2.2.2.1.7 – Wireless

Mobile cellular is one of the fastest growing segments of the telecommunication sector. Wireless technologies are emerging as a serious competitor for wireline networks, not only because of the advantages related to mobility but also due to the possibility of rapid deployment. In developing countries and regions with under-developed telecommunications infrastructure, significant unmet demand has become a strong incentive for the growth of mobile services. In short, cellular technology is seen by consumers and proposed by operators as a direct substitute for traditional wireline services. The technology seems to be ubiquitous, since the substitution mentioned is happening even in rich countries that have a very well developed infrastructure – young people in Finland and Norway, for instance, are preferring to use only the mobile line everywhere rather than keeping a fixed line in home.

Other important technology in wireless is the WLL (Wireless Local Loop) earlier mentioned. This technology uses radio waves to provide the final link between telephone network and subscriber, raising the possibility of a dramatic reduction in the interconnection costs. A substantial proportion of the total cost of traditional fixed line is located on the last few hundred meters of the local loop, comprising the cost of the fixed capital, right of way costs, labor costs, and the cost of digging up and relaying busy urban streets. The prospect of simply locating a base station and adding new subscribers, rapidly and at relatively low cost is, therefore, extremely appealing

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8 Jupiter Communications. IP Telephony - Telcos must cannibalize services to ensure market share. July 1998.

especially to new operators.

2.2.2.1.8 – Technology Convergence

The convergence of the telecommunications sector with the computer and broadcasting worlds has brought the possibility of synergies – to the benefit of companies in one industry who wish to utilize their technology in another industry at relatively little extra cost. Convergence is being driven by four main factors:

- Deregulation of the information industries: telecommunications, computer, and broadcast industry have had substantially different industrial structures. Whereas the public telephony has traditionally been a highly regulated industry, the computer industry has essentially been part of the private sector, and television stations are partly state-run and partly private, but subject to regulations given the influence of the mass media and the importance of the content. Deregulation is increasingly allowing companies from one sector to gain market entry into another.
- Digitalization: the process of digitalization began in the computer industry, and now is well advanced in the telecommunication industry and spreading to the broadcasting sector. It is becoming increasingly difficult, and unnecessary, to distinguish between the different parts of the "bit business". Information is being able to flow from any source to any destination, providing that the network is digital and some form of transmission and switching is available.
- Rapid growth of the service economy: the processing, storage, transmission, and retrieval of electronically coded information have assumed increasingly strategic significance. It has also resulted in the personalization of services: in the computer

sector with the arrival of personal computers, PDAs, etc; in the telecommunications sector with the development of personal mobile communications; and in the broadcasting sector as individually tailored viewing increasingly supersedes programmed schedules.

- Globalization of markets: the swift towards globalization has placed an increase pressure on fast, secure, reliable transnational communications links. It is also challenging the concept of domestic markets, since communications is becoming less defined by geographic boundaries and more related to "communities of knowledge".

2.2.2.1.9 – Future Value Chain

In the near future, "the information infrastructure and industry organization as we have seen today will become far more complicated and diverse, as a variety of technologies and companies will try to fill distinctly niches"[9].

One clear example is the current situation of the competitive local exchange carrier (CLECs) in the US telecommunication market. One can argue that it is very difficult for the local players to offer competitive prices in the relatively static market for residential phone services when facing an incumbent with an installed network, a famous brand name, and an organized and trained workforce.

But technology is changing and, ironically, it is the advent of new services that will facilitate competition in the old services.

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9 Peha, John M. Telecommunications Competition In 2010. The Journal of Policy, Regulation and Strategy for Telecommunications, Information and Media; Vol 2, no. 1, April 2000.

Innovations and convergence of technologies now allow new carriers to compete for a piece of a much larger revenue stream – for telephony, cable television, Internet access, and novel applications. At the same time, the benefit of having a network already installed are falling, because any company that endures the expense of deploying new infrastructures will have a more versatile and cost-effective system.

The emergence of so many different services providers, supported by different and innovative technologies makes the competition possible, but it may not be the fierce competition of firms offering identical services as in long distance telephony - providers will assemble communications packages to attract different market segments. Initially, customers might be categorized simply as residential or business. For example, cable companies may focus more on residential consumers, since these companies have always served more homes than businesses and, although their services is more prone to outages, their customer knowledge give them an advantage over their close competitors. On the other hand, businesses always demand more, and will pay for it. Overtime, the packages will become more specialized and the division between residential and business will become to blur. One company might offer a package designed to attract telecommuters, who need dependable services and access to relevant applications and information, while a competitor offers a less expensive package with content and services for the recreational residential customer. Many different market niches may emerge, such as schools, medical facilities, etc.

In the long-run, the extent of competition will depend greatly on other factors, like whether there will be enough demand to support multiple firms, whether there will be significant barriers to entry the market, and whether one carrier can capture many of the

enabling resources (like spectrum license or the right of way to lay fiber). It is worth to say that these two latter factors are often in the hands of policy makers that will play, as always, an important role in shaping the future of competition in the telecommunications sector.

To sum-up, the future might no be easy for the incumbents as new technologies can disrupt the current value chain and allow the emergence of new players more specialized in different markets segments. The future value chain will depend also on the government interference, since policymakers must recognize and react to changes in the technology and business climate. It will depend on whether restrictions are placed on proposed mergers, resale agreements, and interconnection. It is going to depend also on whether and how common carriage restrictions and universal services subsidies are extended to new medias, and how spectrum is managed. In the era of unregulated competition, the telecommunications sector will depend more than ever on the knowledge and wisdom of the policymakers.

2.3 Regulatory Frameworks

2.3.1 - Introduction and Characterization

The current concern with the withdraw of governments from the role of producing and delivering services, and their assumption of the dual roles of enabling and regulating, are majors changes in the way societies provide for their needs. Governments can enable private delivery of services through financing, subsidizing, promoting and contracting. They regulate by setting policy, legal frameworks and

standards of operation. These new tasks are more difficult and complex than governments had before. New organizational structures have to be built and new skills imparted to carry out new functions, and new attitudes developed to displace a culture of risk avoidance and lack of competition.

Broadly speaking, there are four ways of making an activity private [10]:

- Divestment by transferring state-owned assets to private ownership;
- Delegation by transferring control of state assets or activities to private control/management, e.g. by concessions, leases, etc;
- Displacement by passively allowing the private sector to expand, or by actively promoting the private sector involvement in former public activities;
- Decentralization, shifting the decision making to agents operating in accordance with market indicators, together with the introduction of private sector managerial autonomy and incentives.

2.3.2 - Privatization, Liberalization, and Deregulation

Strictly speaking, privatization differs from deregulation, but there are some clears overlaps. Deregulation of a sector that has been dominated by a state monopoly allows new (private) entrants and the growth of competition – this lies within the third definition of privatization mentioned in the last section. However, the distinction becomes more important where there are serious difficulties with privatization by divestment.

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10 The Telecommunications Industry. The Challenges of Structural Changes. OECD, Paris 1988.

Deregulation and liberalization open the gate to competition, which has a powerful impact on efficiency and economic growth.

Based on the discussion so far, one can assign the following definitions for each one of these terms [11]:

- Privatization is a term that has been commonly used to refer to all developments in which public enterprises and operations are transferred from the government to the private sector. It is a major event that can never be indifferent to the all stakeholders involved. From the unions to the state-own company managers and employees, to government itself and the society, all must be involved in the process, as the transfer of a public utility to private owners is considered a matter of national sovereignty.
- Liberalization refers to lowering the barriers to entry, to all or part of the market, allowing third parties to compete with established providers of goods or services. This competition can bring enormous welfare to the society as enables new and better services, tariffs reduction, etc.
- Deregulation was originally conceived as a process by which governments would reduce their intervention in the operation of markets. The dismantling of legal controls would presumably provide the adequate condition for a healthy competitive business environment operating under market laws. However, as it will be seen, in the telecommunication sector experience has demonstrated that achieving fair competition usually requires the re-regulation of the sector after the privatization

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11 Ryan, Daniel J. Privatization and Competition in Telecommunications. Praeger, 1997.

process.

To conclude, privatization and liberalization have a strong effect on the degree of regulation. When government transfers a state-owned monopoly to private hands, it must prevent a non-predatory behavior from the private firms. On the other hand, when market is liberalized, the regulatory agent should also try to deter dominant firms to crowd out new entrants.

2.3.3 – Privatization in the Telecommunications Sector

In the early days, telecommunications used to be private. Large developments took place both nationally and internationally and a plurality of players flourished. Afterwards, there were some moves towards monopolization as a consequence of regulation. Major reasons were:

- Preventing competition with telegraph services;
- Encouraging interconnectivity and universal services;
- Strategic and military considerations;
- State ownership was common (notable exceptions were U.S. and Finland)

However, these conditions that in some extent kept plausible the argument for a state-owned monopoly no longer exist and the privatization become an inevitable trend. The main reasons for going back to full private-sector involvement are the following:

Efficiency considerations: private and public technical progress increased quickly, placing state enterprises at a disadvantage. The extent of economies of scale in network construction and utilization decreased. This allowed plural players in the

market and therefore marked solutions. Thus, the core of "natural monopoly" shrank. New technologies allowed a plurality of services demands to emerge and just one monopoly supplier could no longer efficiently satisfy them.

Globalization of services: the internationalization of trade and commerce requires a supporting network and service infrastructure. The increasing globalization of national economies has put great emphasis on the critical role of telecommunications, so that efficient structures must be found to realize the potential of available technologies. The emergence of global players forces national telephone administrations also to become global in order to maintain their home markets and to keep their domestic customers. Additionally, higher telecommunication penetration rates allowed governments to ignore the issue of universal service in preference to more competitive industry structures.

Lack of investments: in addition to lowering the cost and increasing the variety of telecommunications services, the increase of network availability is a fundamental issue in many countries. Privatization has been one way to overcome lack of investment and insufficient infrastructure (examples are Chile, Argentina, United Kingdom, etc). Especially in lower-income developing economies the lack of domestic funding can only be overcome by foreign investments. Moreover, privatization solves the dual principal/agent problem since the investor, the principal, is at the same time, the agent who carries out the investment.

To sum up, the process of telecom privatization is complex and cannot be rushed. It requires a long-range vision and a continuing political commitment, perhaps for as long as a decade. Developing countries, especially, have difficult with the choice

to make with regard to regulation. Where the vast majority of citizens lack access to telephone, and most of them could not afford even the cost of installation, governments must balance the urge to introduce competition and reduce call charges with the need to enhance the profits of the state corporation so that it can finance extensions to the network.

Ultimately, the success of any privatization program depends on the people involved in the process. There are no clear road maps to follow, there are no specific guidelines to implement. Progress requires just hard work and the courage to follow the trends to liberalize the economy, increase efficiency, improve productivity, reduce costs and enhance customers services through improved accessibility, connectivity and new technologies.

Chapter 3: Case Studies

3.1 Introduction

In this section it will be briefly discussed the privatization of the telecommunications sector in the United Kingdom and Germany aiming to establish some common points and implications of these programs for the Brazilian privatization case. Additionally, it will be analyzed specific issues when privatization occurs in developing countries.

The British case was selected because with over fifteen years since the privatization, the UK is considered to be one of the most competitive telecom markets in the world. The case presents interesting insights in terms of competitive movements done by both the incumbent and by the new entrant, the decisive role played by the independent regulator, and the consequences of its policies and constraints. Moreover, just like in the Brazilian case, the regulatory framework defined a duopoly system, with the new entrant being allowed to compete in all market segments.

The privatization in Germany is worthwhile to analyze given the different regulatory framework adopted, which established from onset a market-oriented regime that encouraged the rapid development of full competition and virtually no early protection for the incumbent to prepare for the competition. Specifically for comparison with the Brazilian privatization process, Germany case offers valuable insights given

that both processes were confronted by the strong political influences over the telecom policy, challenging the independence of the regulatory agency [12].

Finally, the last section of this chapter deals with particular issues that emerging countries are facing during their privatization processes, issues that are not encountered in the developed markets. The lack of an established infrastructure, the huge necessity of investments after the privatization, the typical market growth explosion due to unattended demand are some of the specific concerns that governments have when deregulating the telecom sector in these countries.

3.2 United Kingdom: The Privatization of the British Telecom Market

Until it was privatized in 1984, the incumbent telecom operator in England, British Telecom (BT), was a public enterprise and had a virtual monopoly on all telecommunications services. Unlike AT&T in the U.S., BT was not broken up at some point in the privatization, and was allowed to keep its local telephone operations. By 1998 BT was still a widely dominant player in this segment (BT still had 94% of local lines in 1995). During the BT's privatization, it was sold 50.2% of its shares to private investors, but the main shareholder remained to be the British government.

A second nationwide network operator, Mercury, was licensed in 1982 and began competing seriously with BT in 1986. The government's policy was to create and protect a duopoly for a period of time over which Mercury could built its own network

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12 Rebecca Endicott Birdseye Weil (2000). Building Markets: The Liberalization of the European Telecommunications Industry, MIT Political Science Department Thesis.

and gain market share. In 1984 the Telecommunications Act created an independent regulator, the Office of Telecommunications, or Oftel, to deal with all the regulatory issues and with objectives of fostering competition and improving the quality of services to the end users.

3.2.1 The Outcomes of the Privatization

Prices: Before the privatization, the prices of international calls were very high because BT had to cross-subsidize the local call services, which had low prices despite their very high costs. Leading the privatization thinking, in October 1982 Professor Stephen Littlechild from Birmingham University proposed a model based on a "Price Cap" as the method to set the prices for the telecommunications services. Since then, the political interference was reduced and BT had to consider the real factors in its pricing policy, such as inflation rate and the working efficiency. In 1987, the prices of the long-distance calls were much lower due to the price cap method and the competition with Mercury. On the other hand, the prices of the local calls and other services were much higher given some intrinsic advantages BT managed to keep (see next item).

Changes in the Competition Environment: After the privatization, BT was still a powerful company and had more privileges than Mercury, since the British government privatized BT as an integrated national unit. The government, as well as BT's executives, thought that to sell the whole company at once would be easier and the price would be higher rather than selling the company in pieces. For this reason, BT

kept much of its power and the best network operation in the United Kingdom. Evidently, BT used its power to obstructed Mercury in many ways, such as when a consumer wanted to use Mercury's system he/she would have to change his/her phone number, which took much time to do so and caused many problems to the user; BT's interconnection fee was set very high thus not allowing Mercury to be very effective in its pricing strategy; and BT launched promotional campaigns in form of quantity discounts aiming to persuade consumers to stick with BT's services. Mercury's strategy was to build direct link to large businesses mainly in the city of London and to compete with BT for residential users' long distance and international services through accessing BT's local network. Mercury aimed to have 5% of the market share in 1990. To reach this goal, Mercury used price discount as the promotional campaign but BT fought back using the same method. Therefore, the prices of the long-distance services and the international services declined very rapidly. In the local loop, however, BT's monthly access charges and local call rates remained stagnant – mostly to equilibrate the revenue losses from the long-distance markets.

The duopoly policy period expired in 1991, when several new operators were then licensed mainly through Britain's Value Added Network Services Licensing Act (1982) that provided the necessary framework to permit an explosive growth of value-added services. By 1996 more than 200 VANs existed in the UK. The potential of these services opportunities seduced many international companies operating in Europe, thus motivating a considerable pressure to other European governments to imitate the British reform.

Benefits for the Society: The results for the society of the British telecommunications privatization program were quite remarkable as shown in the following evaluation carried out by the OECD (Organization for Economic Cooperation and Development) in 1994 [13]:

- Price: due to the competition, BT's prices have fallen by around 30% in real terms since privatization and with the inflation at low levels should begin to fall in absolute terms.
- Quality of Service: some highlights were: 96% of BT's phone boxes work compared to 75% in 1987; 96% of BT's residential customer installations are completed within the time agreed with the customer; more than 92% of calls to directory enquiries are answered within 15 seconds, up from 88% in 1991.
- Choice: in 1993 UK consumer had four different suppliers for local, national, international and mobile services. Customers can now buy or rent their telephone apparatus and there is an increasing choice in terminals. Some 13,000 items of equipment have been approved for use in the UK since 1981. A call now can be made from a fixed line telephone (including PABX and cordless phones), analogue cellular, digital cellular, PCS (Personal Communication Services), or even a portable satellite terminal.

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13 Telecommunications Infrastructure. The Benefits of Competition. OECD, 1995.

3.2.2 Lessons Learned

The British case presents several important lessons about the privatization and liberalization in a national telecommunications market [14]. First, BT's massive restructuring provides a compelling example of how a large and bureaucratic incumbent can become an aggressive international competitor. Second, it reiterates the vital importance of having a strong and independent regulator, capable of promoting and enduring full competition in all segments. Thirdly, the necessity of paying close attention to the local loop market, due to the natural dominance that the incumbents enjoy since they own the network and have close contact with the end users. Finally, overtime, the UK experience suggests that competition eventually leads to industry consolidation.

3.3 Germany: Market Liberalization and Privatization

3.3.1 Introduction

For over one hundred years, German telecommunications remained isolated and vastly state-centric. Telecommunications was a highly protected sector in this country, as throughout Europe, and politics, culture, and economics combined to focus German regulatory attention on the domestic market.

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14 Rebecca Endicott Birdseye Weil (2000). Building Markets: The Liberalization of the European Telecommunications Industry, MIT Political Science Department Thesis.

Before the telecommunications markets in Germany were opened up to competition, the present Deutsche Telekom (DT) was part of Deutsche Bundespost (the German Federal Postal Administration). The state-owned enterprise performed both governmental and entrepreneurial tasks and in return was granted far-reaching monopoly rights including the monopoly on networks and voice service.

However, withy the rise in number and power of multinational firms, as well as the emergence of global telecommunications networks, Germany could not continue to ignore external pressure to adapt its centralized model. By late 1995, the impetus for liberalization in the German telecommunications sector reached critical mass and culminated with the German Telecommunications Act of 1996. This law dissolved the Federal Ministry of Post and Telecommunications and put in its place the Regulatory Authority for Telecommunications and Posts (RTP). This regulatory agency is a constituent part of the Federal Ministry of Economics, and is intended to have independent regulatory powers. However, the Minister's authority over regulatory policy created a potential serious conflict of interests since the German government is still the main shareholder in the DT.

In this sense, while RTP has legitimate, enforceable and independent regulatory power, its intention towards a more open regulatory model is often politically challenged and motive of significant disputes in the domestic sector. For instance, the incumbent (DT) frequently criticizes RTP, especially regarding the unbundling access to the local loop ruled by the agency. The company argues that RTP consistently privileges new

entrants and ignores the fact that competitors seeking inroads into DT's markets are not new or vulnerable companies, but are themselves strong and public operators from sectors such as electricity or transportation.

In fact, the German model encouraged full competition in all markets and, as a result, approximately six months after the liberalization deadline in January 1, 1998, more than one hundred and twenty companies had been granted licenses to compete against Deutsch Telekom [15]. Therefore, it is likely that the domestic dilemma between new entrants and the established incumbent will remain contentious for the foreseeable future. Notwithstanding, the more important fact is that Germany clearly has embraced a more liberal approach.

3.3.2 Advances and Early Outcomes of the Privatization Process

The complete deregulation of the German market in the beginning of 1998 has already resulted in a drastic shift of forces in the fixed network. In the areas of national and international long-distance telephony and among business consumers, the competitors of Deutsche Telekom positioned themselves very successfully from day one. The price of long-distance calls has fallen by more than 40% since the market liberalization and DT has had to cut its prices and offer all kinds of incentives to keep its customers. As a consequence, its net profits in 1999 were 45% lower than the previous year [16].

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15 Telecommunications - Germany in Year Two of Competition. Hypovereinsbank Research. March 24, 1999.

16 Telecommunications - Germany in Year Two of Competition. Hypovereinsbank Research. March 24, 1999.

The deregulation of fixed-network telephony presented not only providers but also subscribers with new challenges. They were confronted with a variety of calling models such as direct connection (user select one carrier that handles all kind of connections), pre-selection (all long-distance call are channeled directly to exchanges of alternative carriers and, outside the local loop, transferred to its fixed network), and call-by-call (users decide the carrier on a case-by-case basis by dialing the corresponding five-digit operator code).

Particularly successful were the many small providers that did not invest huge amount of capital but, instead, exploited the regulatory framework and put all their money on the call-by-call services. The initially relatively large gap between interconnection tariffs and end-customers prices in the field of national and international long-distance calls made possible lucrative product offerings that resulted in a massive loss of market share for Deutsche Telekom.

In the local loop, however, the incumbent did not suffer much. So far DT managed to keep its monopoly over the "last mile" in the fixed network. Since alternative technologies are not yet well established for the mass market, competition has been limited extensively to the use of the infrastructure of the former monopoly. Therefore, at least in the near future, competition in the local loop is expected to develop only for the lucrative value-added services and geographical areas with high customer density.

3.4 Specific Issues in the Emerging Markets

Although there has been a dramatic increase in telecommunications investments

worldwide in the last two decades, there are still enormous gap between the developed and developing world in accessibility to telecommunications, and within the developing world, between urban and rural areas. In this sense, this chapter would not be complete if the focus were only case studies involving telecom privatization in mature markets such as UK and Germany. Specific issues arise when the analysis goes to emerging markets, and they must be addressed in order to help us understand the privatization in Brazil, the foremost objective of this work.

An analysis of strategies for increasing access to telecommunications in developing countries must be placed in context. First, telecommunications technolcgies have changed dramatically in the past decade, and many recent innovations offer promising solutions for extending services at lower costs than were generally thought possible. Therefore, the recent privatized telcos in these countries can address the lack of infrastructure by jumping to new technologies that can help them to overcome the problem of investing heavily and for many years before seeing the return on their investments. However, in order to benefit from this "last move advantage" the developing countries quite often have to attract and retain foreign companies that can bring these new technologies and, thus, the rules set by the regulatory body during the privatization and liberalization of these markets are decisive if not totally essential.

The lack of political independence and economic autonomy in several developing countries makes the sole existence of a conversant, powerful, independent (both financially and politically) regulator an absolute necessity. Its top priority shall be the supply of universal service, at the best possible price and under the best possible conditions to its nation.

Many developing countries are trying to "leapfrog" in terms of telecommunications by investing in wireless networks or other technologies, rather than adopting the capital-intensive project of wiring miles and miles of residences and businesses. However, in order to be a successful movement, the market and the regulator must be aligned. Competition, deregulation and privatization must be moving ahead at the same pace to ensure that effective, meaningful growth will occur in a competitive market. The regulatory framework must also "leapfrog" to adapt to the changing technologies and state of competition in the market. As the world adopts international competitive standards, the global markets will provide additional pressure on countries to adopt generally open competitive and regulatory policies in order to operate efficiently and effectively in this new international climate.

Considering not only developing, but also developed countries, one of the most important lessons learned from telecom reforms around the world is the importance of making an effective transition from government as operator to government as regulator. First of all, the nature of the regulatory authority itself must be defined. Regulatory models from one country cannot be imported directly to another. Although important lessons may be learned from countries with significant regulatory experience, any regulatory process must be customized to meet the unique requirements of a particular country and its position on the market.

One of the most important features in the developing countries for changing telecom landscape is embracing the development of global markets for telecom equipment and services. These global markets are quickly breaking down traditional boundaries of national identity. The market for international services is no longer limited

to the national customer base in the country in which a carrier is licensed. These developments will challenge the way international telecom correspondents relate to each other as well as how international services are marketed and signal greater urgency for reform. As the customer side on the demand base is becoming global, so are the carriers and services on the supply side. Alliances of national carriers will result in a tangled web of multinational interests in both national and international systems. This will raise policy issues regarding market entry by foreign carriers and questions as to whether or not carrier combinations indicate an increase in desirable competition or an undesirable concentration. Government decision-makers might then have to evaluate the relative advantages and disadvantages of applying trade policies in order to ensure maximum consumer benefit.

In conclusion, all of the approaches mentioned are variations on the same theme: the desire of the developing countries to attract private sector investment in a way that maximizes infrastructure build-up, introduction of new technologies, and extended universal service.

Chapter 4: The Telecommunication Industry in Brazil

4.1 – Introduction

Brazil is a large country in terms of both area (with 8.5 million square kilometers, it is slightly smaller than the U.S.) and population (around 167 million in 1998). Its telecommunication infrastructure is one of the most advanced among industrializing nations, although at the same time teledensity and accessibility is low. Brazil's telephone system deteriorated considerably during the 1980s and early 1990s due to prolonged economic crisis, and it has been recovering over the past few years mainly due to a so far very successful privatization program.

Until the mid-1990s, Brazil's attempts to modernization and change in telecommunications differed from those in other Latin America countries. The Brazilian approach was not to engage in privatization but rather to maintain control by government monopoly. But in 1995, the social democrat government of president Cardoso began transforming the telecommunications sector, starting with the removal of the legal monopoly of the state-owned Telebras system.

In November 1995, the government proposed a "minimum law" that was approved by both houses of Brazilian Congress in 1996. This law regulates only four services: cellular telephony (to operate on the B-band); satellite communications; data transmission to closed user groups; and value-added services. The government did not proposed privatization as a short-term objective, except for public operators who

provided cellular telephony on the A-band. The government ordered that the sales of assets would take place only after the implementation of other reforms, including tariff rebalancing, mergers of operators into regional groups, and establishment of management autonomy. The government also emphasized that it did not seek to replace a public monopoly with a private regulated monopoly but rather to introduce open competition.

4.2 Brief Historical Background

In the two decades following the end of World War II, the Brazilian communications system expanded rapidly, in conjunction with the growth of the country economy. However, this expansion was constrained by the power of local and state authorities to grant communications services franchises. These franchises led to an incredibly fragmented market, with over 800 national and foreign private concessionaires. Unrealistic low tariffs also contributed to reduce investments and sluggish growth of telegraph and telephone traffic. Thus, in 1957 Brazil's teledensity of 1.3 per 100 inhabitants was only one third of the world average of 3.7.

In 1962, the law 4,117 (Brazil's Telecommunication Code) was decreed as the basis for the evolution to a new institutional regime and reorganization of the system. The code granted the state monopoly in the operation and regulation of telecom activities. It also created the National Telecommunications Council (CONTEL) to develop a National Telecommunications Plan aimed at unifying and modernizing the system by reducing market fragmentation and rationalizing equipment supplies.

The Brazilian Telecommunications Enterprise (Embratel) was approved at the same time with the initial objective of implementing and operating domestic and international telecom trunk operations, and regulating telecom services.

Telebras (Brazilian Telecommunications) was created in 1972 to plan and manage the national telecommunications system. As part of this plan, most of the federal government's ownership was transferred to Telebras. By 1973, through a series of purchases and mergers, Telebras had drastically reduced the number of companies operating telephone networks. Telebras often held a majority interest in these consolidated firms, and in 1992, Telebras accounted for over 90% of the total telephone lines through its control of 27 pole companies. At this time, almost half of its stock was in public hands as a result of sales of shares to purchasers of telephone lines as a way of financing the system's expansion.

As just mentioned above, at that time there was a scheme to make up for Telebras' lack of capital resources to invest in the network expansion. Typically, to get a telephone line the prospective customer signed up with the local Telebras affiliate and paid (in 1992) the equivalent of US$4,000, which could be financed. Within a year, the customer received Telebras stock equal in value to the payment. The local Telco had up to two years after the final payment to actually install the telephone line and give the customer a telephone set.

However, despite the high prices paid by the Brazilian customers, the quality of telephone service declined considerably since the second half of the 1980s. Failed local calls, already above average by international standards in 1980, increased to 25% of all calls in 1990. Crossed lines and wrong destination numbers also continued to increase.

At the end of 1990, 30 out 100 calls between the two major Brazilian cities (Sao Paulo and Rio de Janeiro) did not complete. Overall, the direct dialed long-distance call completion rate fell from 49% in 1986 to 41% in 1990, and the chance of even getting a dial tone fell from 95% to 88%.

4.3 The Privatization Process

In February 1995 the president Cardoso government, following a huge privatization process that started with the selling of the state-owned steel companies yet under president Collor presidency in the early 1990s, put before Congress an amendment to the 1988 Constitution abolishing the state monopoly on telecommunications. This proposal, approved by the lower house in May 1996, was interpreted as a "flexibilization" of the telecommunications monopoly, to distinguished from a privatization (sale of assets) of Telebras. The privatization per se was still in the political discussion phase.

In addition to the elimination of the monopoly, the government put into effect other important measures:

- Investment Plan: An overall plan for the sector was laid out contemplating investments of US$ 75 billion (from both public and private sectors), of which half planned to be invested in the first phase of the plan (1995 to 1999) and the other half in the second period (2000 to 2003)
- Tariff rebalancing: Adjustments in the telecommunications charges were necessary to eliminate the cross-subsidy and to realign the prices with the past inflation

indexes. As a result, the basic residential subscription was increased by 513%, the price of the local meter unit by 67%, and the price of domestic long-distance service by 21%.

- Minimum Law: In 1996, the Congress approved a law to allow the rapid introduction of the private sector not only in cellular telephony (where there was great pressure from the private sector) but also in satellite transmission, data transmission, and value-added services.

Major changes were up to take place. But in 1997, Brazilian telecommunications services were still provided by Telebras, which at that time was a holding company through its 28 subsidiaries: 27 local operators plus the long distance carrier Embratel. The "General Telecom Law" was finally enacted in 1997 giving the government a go-ahead with comprehensive liberalization. A new regulatory agency, National Telecommunications Agency (ANATEL), was created in late of this same year to facilitate the process. The growing sentiment for privatization in Brazil also came from the privatization of cellular and other services, which increased the constituency of these efforts in the country. Finally, given the finances of the Brazilian government, the government needed the money from privatization.

4.3.1 Differences Between the Latin America's and Brazil's Model for Privatization

Generally speaking, the Latin America model for privatization is composed by three stages [17]

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17 Sapoznik, R. Opening Brazil's Telecom Markets to Competition. Technology Futures, Inc. www.tfi.com

- The issuance of regulatory and legal rules setting targets for opening the sector;
- The assembly and enactment of a regulatory body to supervision and regulate the privatization process;
- The actual sale of state companies to private initiatives, usually composed of foreign investors in association with national companies.

The consequences of this model are that, for a relative long time there is a private monopoly established, theoretically "supervised" by a state agency, while the crucial introduction of competition is delayed. The problem is that only competition can force the players to transfer any benefits originated from economies of scale and new technologies to the consumer. Yet, there is also fierce criticism of the transfer of domestic assets to multinationals.

The Brazilian model adds an intermediate step to the Latin American model. In addition to creating the regulatory body (ANATEL), a transition stage between public monopoly and open competition is put in place through the establishment of private duopoly.

Based on this model, one can summarize the Brazilian privatization model in four steps:

1. Form the legal framework by eliminating the monopoly through a constitutional amendment, by approving the new telecommunications bill, and by creating the regulatory body – ANATEL;
2. Restructure and privatize the Telebras system, establishing three local fixed-phone companies, eight cellular phone companies, and one long-distance and international

carrier (Embratel). The three fixed-line providers would be for the south-central region (Telesul), the northern region (Telenorte), and the Sao Paulo state (Telesp).

3. Implement competition using the regional duopoly model by breaking up the country in three regions for the fixed line telephony and in ten regions for the mobile segment. Sell authorizations to new entrants who will establish "mirror" companies to the already existing concessionaires in each one of the regions mentioned.
4. Establish open competition in the telecommunications industry after a period of duopoly competition. The year 2003 was defined for opening the country to unrestricted competition regulated only for antitrust behaviors, with an anticipation possibility to 2002 for the companies that achieve the universalization and quality targets defined by the regulatory agency.

Figures 4.1 and 4.2 in the following page show the division of the national territory for the long distance and mobile market, respectively.

Figure 4.1: Division of the Brazilian territory for the long distance market

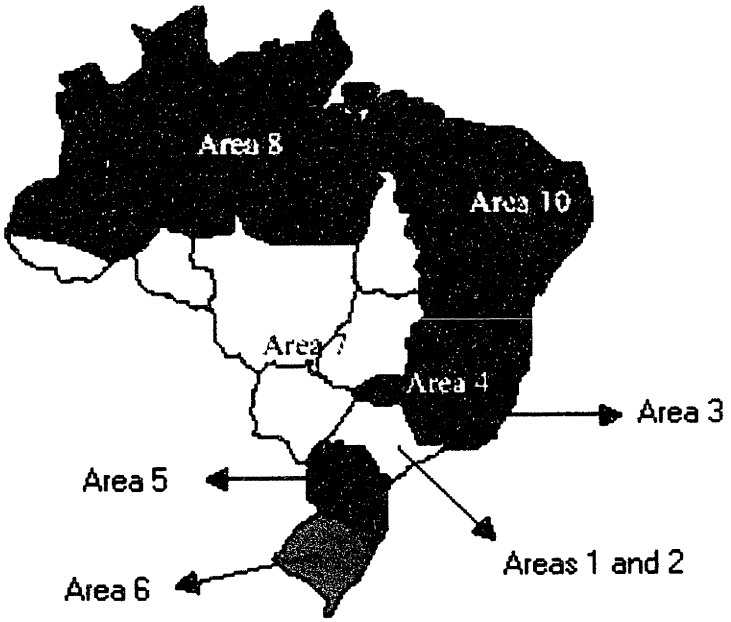

Figure 4.2: Division of the Brazilian territory for the cellular market

4.3.2 The Duopoly Model

The duopoly structure adopted by the Brazilian government presents several advantages. First of all, it allows adequate planning for granting new concessions based not only on the price bided, but also on the level of investment and coverage proposed by each bidder. In addition, full competition is limited at first and price wars are avoided, ensuring a safer return on investments. There are risks involved, though. Investments in parallel infrastructure and possible price reductions can decrease the value of the business for each of the duopolies and, for that reason, the most common behavior for both is to cooperate by adopting a strategy that would avoid or minimize those risks.

However, the existence of a non-rigid duopolistic situation makes it more difficult for the players to negotiate agreements in order to geographically divide the market, as there will always be a new company interested in investing to develop a market where there is a demand not met. The non-restricted interconnection and the possibility of new entrants to acquire access to their networks from the old (privatized) dominant companies reduce the necessity of investing on duplicating infrastructure. These two aspects benefit the growth of competition and, in association with the gradual flexibility of the obligations imposed on the incumbents carriers allow, in the medium term, the creation of a competitive atmosphere, thus requiring much less intervention by the regulatory agency. That is the main reason why duopoly is a temporary stage, with the final model being open competition with no limit on the number of companies operating the networks.

On top of all these considerations, another variable must be analyzed: to the incumbents is given the chance to move first and establish a short-lived but crucial *de facto* monopoly before the entrance of the "mirror" competitors. Therefore, the first movers determine their level of output, forcing the second entrant to accept it as a given. However, repressed demand may absorb this level of output and set high levels of output for the mirrors as well. Sure, the entrants, as seen in the British privatization, tend to go for the more profitable segments first – businesses in larger cities – and competition moves towards pricing and quality levels, rather than output/availability. These latter parameters obviously are object of the regulatory body that defines minimum coverage to be reached by each player in each geographic region.

4.4 The outcomes of the Brazilian Privatization

On July 29, 1998 the privatization brought US$ 18.5 billion for the Brazilian government, far exceeding the minimum asking price of US$ 11.5 billion and was a major event that contributed a lot for president Cardoso re-election on October of the same year. It was the largest privatization in Latin America and The Wall Street Journal noted "nobody thought the government could stick to its July timetable for the sale with national elections looming in October". The biggest international winner was Spain's Telefonica, which won the Telesp (Sao Paulo's fixed line telephony) and two other cellular licenses. Others included MCI, Portugal Telecom, and Telecom Italia.

In the list below is shown the several players in the different Brazilian telecommunications markets. Despite the fact that the country is expected to

experience a significant growth over the next few years, the arrival of new players should lead to a reduction in market share and in the contribution margin of various services for these companies. The Brazilian telecommunications sector (as of February 2001) encompasses:

- Three fixed-line regional operators (Telemar, Brasil Telecom and Telefonica)
- Three mirror companies for the regional incumbents (Vésper Norte Leste, GVT and Vésper São Paulo)
- One long distance and data transmission operator (Embratel)
- One new player in the long distance and data transmission segment (Intelig)
- Nine Band A cellular operators (Telesp Celular, Telefonica Celular, Telemig Celular, Tele Celular Sul, CRT Celular, Tele Centro Oeste Celular, Tele Norte Celular and Tele Nordeste Celular)
- 10 Band B mobile operators (BCP São Paulo, Tess, ATL, Maxitel Minas Gerais, Maxitel Bahia and Sergipe, Global Telecom, Telet, Americel, Norte Brasil Telecom and BCP Nordeste)
- Niche players in the data transmission segment, such as AT&T, MetroRed, Impsat, etc.

After almost three years since the auction that transferred to private companies the Brazilian telecommunication system, the results to the society have been quite remarkable. Based on a model that privileges the competition and with a powerful regulatory agency to guideline issues such as universal access, quality of the services,

prices, etc the whole country have been benefited from the massive investments made by the private companies so far. Some of these results are shown below:

- 84% growth in the number of terrestrial lines (from 18.8 million to 34.6 million), exceeding in 1.6 million the target aimed at the end of 2001;
- Digitalization rate reached 91% (from 68% before the privatization), whereas the teledensity jumped to 21 lines/100 inhabitants (from 11.7/100 in 1997);
- 341% growth in the mobile penetration: from 4.6 million subscribers in 1997 to more than 20 million in August 2000;
- Prices dropped dramatically: installation costs dropped from US$ 1,000 in 1997 to less than US$ 50 in the majority of the Brazilian states
- The average bill for a residential customer dropped from R$52 in 1994 to R$46 (-12%) in nominal values. Considering inflation the cost reduction is even more impressive, more than 50% reduction.

The table in the next page shows the situation before/after privatization and the perspectives for the telecommunications industry in Brazil in terms of investments, number of lines, and penetration rates.

Market	Unit	Accomplished					Perspectives					
		1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
Fixed lines	# (Millions)	16.5	18.8	22.1	27.8	35.0	40.5	45.1	49.6	53.8	58	-
	Penetration rate (#/100 inhab)	10.4	11.7	13.6	16.8	20.9	23.9	26.3	28.5	30.6	32.6	-
	Investment (US$ Billions)	-	-	-	-	-	5.7	5.0	4.4	4.1	3.9	23.1
Wireless	# (Millions)	2.7	4.6	7.4	15.0	21.5	29.2	37.5	45.5	52.5	58.0	-
	Penetration rate (#/100 inhab)	1.7	2.8	4.5	9.1	12.9	17.2	21.9	26.2	29.8	32.6	-
	Investment (US$ Billions)	-	-	-	-	-	3.1	3.7	4.0	4.2	4.5	19.5

Table 4.1 – Penetration rates and investments in the Brazilian telecom market [18].

As one can see from the table above, the growth of both fixed and wireless telecommunications in the country has been dramatic. During the next five years (2001 – 2005) the expected investments in expansion and infrastructure will continue to be very significant (around $43 billions). Another interesting point, by 2005 the projected mobile penetration rate is going to catch up with the fixed line's penetration, reaching almost one third of all Brazilian citizens.

18 ANATEL's Prediction. www.anatel.gov.br

Chapter 5: Scenarios for the Development of the Telecommunication Industry in Brazil

5.1 Introduction

The Brazilian telecommunications industry is poised for a second wave of restructuring with the opening of all markets to all competitors. These circumstances can start as early as the beginning of 2002, provide that the main players accomplish with the coverage and quality levels defined by the regulator (originally designed to be reached in 2003). Another major change is going to be the likely convergence of fixed and wireless services leading the telecommunications market invariably to a wave of consolidation and value creation. Still, despite the expected significant growth over the next few years, the entry of new players and the competition can lead to a reduction in market shares and in the contribution margins, which again are indicatives of cost reductions and consolidation trends.

This chapter will analyze the competitive scenario in each major telecommunication segment in Brazil: fixed line (local and long distance), wireless, Internet, and data transmission. Technology trends and the positioning of the main players will be evaluated in order to assess the main threats and opportunities in each market segment.

5.2 Analysis of the Competitive Scenario

5.2.1 Fixed Lines

According to the premises used in the model for the privatization of the Telebras System, the regulatory body held in February 1999 the auction for new fixed-line telephony licenses, thus creating the duopoly condition in the local and long distance markets. This auction for the same concession areas already established during the privatization in the year before allowed the entry into the market of the so-called "mirror" telcos by July of 1999.

When these mirror companies started up their operations at the beginning of 2000 (Vésper) and in November 2000 (Intelig), the dominant operators already had a vast network, comprising of 28 million terminals at their disposal. The average penetration for fixed-line terminals in Brazil was 17%, with much higher rates in the social classes A and B and in the corporate segment. Despite the pent-up demand at that time, most of the potential subscribers were from lower-income groups or residential customers waiting a second or third line installed.

At that time, ANATEL opted for not opening the local loop to competition. To offset that, the regulator gave to the new players in the sector three main advantages in the fight for market share with the dominant operators:

- Exclusivity in the use of WLL (Wireless Local Loop) technology for the first two years in the regions with more than 50,000 inhabitants;

- Autonomy for choosing the markets and regions in which they wanted to concentrate offering their services and they were discharge of the obligation to adhere to the targets for minimum coverage (universal services obligations);
- Freedom for practicing their own pricing policies, when and where they see fit, and no need for having ANATEL's approval for their tariffs.

However, given the degree of penetration in the fixed-line segment, particularly among the more profitable customer groups, the option for WLL technology have not proved yet to be the best option for the mirror companies. As detailed later in this chapter, WLL offers extremely limited capacity for data transmission and for high-speed Internet access, which means that these operators cannot meet existing demand for second or third lines for Internet access.

The higher penetration rate in the high-income customer groups, the questionable choice of technology, the lack of scale and infrastructure (backbone) to operate efficiently in the segment (resulting in high rental costs of other operator facilities and necessity to pursue their own network expansion) have led to a relatively poor operating performance of the mirror companies up to now [19]. Just to illustrate this point: in its first year of operation, Vésper has only managed to install 550,000 fixed-line terminals in its region whereas Telemar, the incumbent operator, installed 3.8 million terminals in the same period.

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19 Picking the Winners in Troubled Water. Latin America Equity Research - Santander Central Hispano. January, 2001.

Consequently, competition in the local fixed-line segment, just like in the UK and Germany cases, is not imposing yet any real threat to the dominant players and, apparently, has not pressured either the tariffs or margins of these companies.

5.2.1.1 Long Distance Market

Since the privatization in 1998, the growth in the fixed line segment has been substantial (see Figure 5.1). Approximately 1.4 million lines were installed in 1995, a figure that rose to 5.7 million in 1999, an increase of approximately 300%. Another way of looking the growth in the fixed line segment in Brazil is through the increase of penetration density, measured by the number of terminal installed per 100 inhabitants. In 1995, this figure was less than 10% and reached approximately 17% in 1999. According to ANATEL's projections, fixed line coverage density in Brazil will be close to 33% by the end of 2005.

In the long distance segment, the regulator stipulated that fixed line operators (local carriers) were only authorized to complete national long distance calls within Brazilian states; Embratel, consequently, was responsible for carrying all national and international long-distance traffic. ANATEL maintained this system for almost two years after the privatization of the Telebras System. In 2000, the regulatory authority partially deregulated the domestic long distance market, thus opening it up to competition. Since then, fixed line operators have been able to compete with Embratel in the long distance market within their geographic regions. On the other hand, sector regulations also allow Embratel to compete in the market for intrastate calls with the fixed line operators over and above inter-regional competition.

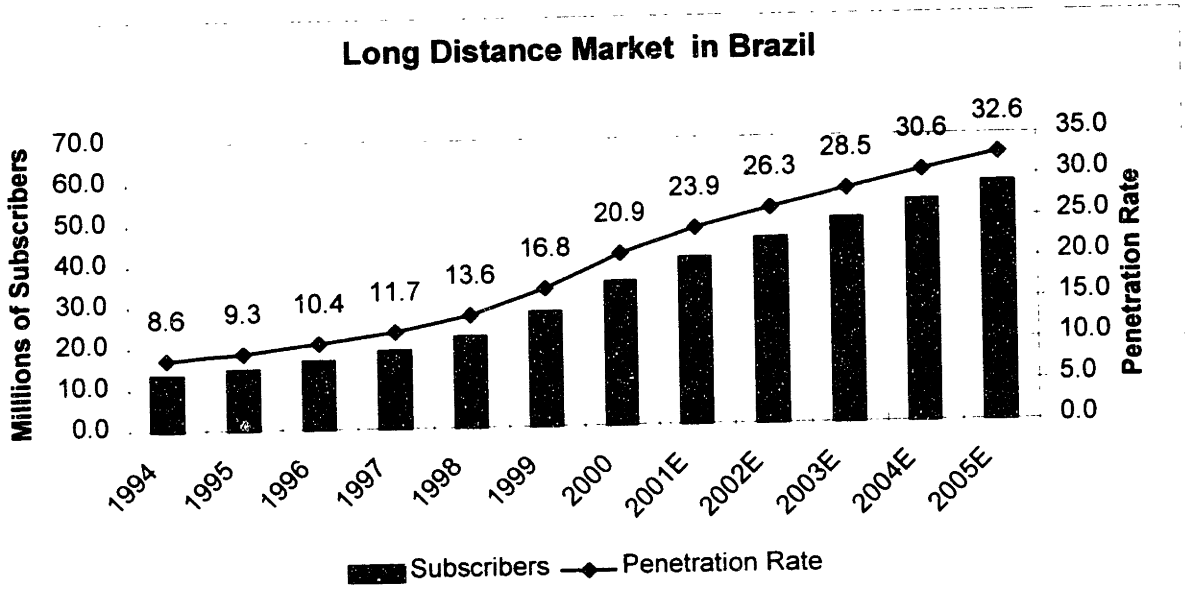

Figure 5.1 – Evolution of Brazilian long distance market [20]

Besides stimulating the growth in the number of fixed line terminals installed and an improvement in service quality, one of the main objectives of the model proposed for sector deregulation is to promote competition within the sector. However, despite the fact that the mirror companies only started up their operations in January 2000, competition in the fixed line segment is still in its initial stages.

According to the privatization model, sector deregulation will be fully implemented in January 2002, when operators will be free to provide a complete range of services from voice to data transmission. However, there are still some conditions that should have to be complied with by companies intending to expand their operations.

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20 ANATEL's Prediction. www.anatel.gov.br

The main condition concerns compliance with the universalization and service quality targets established by ANATEL in the concession contracts signed with the winning bidders in the Telebras auction. Only the companies that meet these 2003 targets before the end of 2001 will be authorized to provide a complete range of services, both inside and outside their concession area, including data transmission and mobile services, among others.

As a result of the efforts being made to reach these 2003 targets before the end of 2001, the expansion in the fixed line market is continuing to be significant and, in a very near future, the constrained demand will no longer be an issue in the Brazilian telecommunications market.

On the flip side, it is expected decreasing margins as new players come to these markets, attracted by little regulatory restrictions, still good margins and low entry barriers. Regarding the data segment, there are fewer and larger consumers, which reduce even further the entry barriers. For the local companies and the niche players, these circumstances can represent a big growth opportunity. For the long distance incumbent (Embratel) it can represent a major threat. The long distance market between regions – the most profitable one – is still a virtual monopoly of Embratel. By 2002, however, this market is expected to be open and heavily attacked by the local companies. It is pretty clear that Embratel has the most to lose since the fixed-line incumbents (Telemar in the Northeast region, Brasil Telecom in the Central-South, and Telefonica in Sao Paulo) will immediately be able to charge their local clients for all their long-distance services if they choose so. For these operators, this opportunity comes at

relatively small costs: direct interconnections charges, an increase in sales and marketing efforts, and probably marginal upgrades of the overall systems.

In this new market condition, it is probable that the service quality will remain roughly the same in the long-distance market after the openness for total competition, since the fixed-line players, for the most part, will continue to use Embratel's backbone for inter-regional and international connections in short to medium term. Assuming that price will see also very little differential from one company to the next, the convenience of having a single billing (for local and long-distance calls) will result in a remarkable lead for the regional incumbents.

5.2.1.2 Local Loop Segment

Up to now, the model established by the regulator stipulates that new players in the telecommunications sector – be they mirror companies or existing operators entering into new markets after deregulation in 2002 – should have their own network for access to the end user. As ANATEL did not opt for a model that included operators sharing each others' local loop, the regulatory body had to establish a series of incentives capable of motivating the mirror companies to build their own networks, as discussed earlier in this chapter.

The controversy in relation to unbundling and sharing of the local loop was raised just after the privatization of the Telebras System, when Embratel was created as a pure player for data transmission and long distance services; as a result, it has restricted access to end users. At the beginning, the company focused on selecting the

more profitable customers to connect to its fiber optic backbone, thus bypassing the local operator. However, the cost of laying fiber optic local loops restricted the company due to the fact that the majority of customers do not represent adequate return for the level of investment required for this type of system.

It is now the case that not only Embratel, but also the mirror companies, are demanding that local operators make their local loops available to give other companies access to these customers and to offer services of higher aggregate value and data transmission without having to duplicate the existing local network. The range of services available using ADSL (Asymmetric DSL – Digital Subscriber Line) also include VoDSL (Voice over DSL), with voice transmission using the DSL network. Although DSL uses the existing copper wire network, transmission over this network is totally independent and leaves the voice channel free. Consequently, as ADSL customers pay a fixed monthly fee, all voice traffic using the system is available at no extra cost to the user.

Currently, there are three means of sharing local loops in the Brazilian market:

- Fixed-line operators rent the copper wire infrastructure on an exclusive basis to certain customers;
- Sharing is restricted to the high frequency local loops. In this case, voice traffic is separated from data transmission by a splitter, which sends data signals directly to the competing operator's network;
- Sale of data traffic (bit stream): this system does not interfere with voice transmission.

The main arguments of local operators for not sharing their networks are: (1) offering access to local loops and switches may result in damage and risk to voice traffic and local operators may lose control of the quality of their fixed-line services; and (2) these operators claim that they are still not getting an adequate return on the investments made in these local networks since the privatization.

Local operators go one step further in this discussion, saying that Embratel's long distance and Internet networks should also be made available for sharing – that would mean total unbundling. As well as demanding the use of data transmission and long distance networks, local fixed-line operators also want ANATEL to lift service quality targets, since the use of local loops by competition means that the same operators could interfere in the networks run by the major players. However, the removal of these targets would put the regulator in an extremely difficult situation, as the control of these companies and the defense of consumer rights would be much harder to implement. At the end of the day, the final decision regarding unbundling is clearly a technical one. ANATEL will weight the pros and cons involved in increasing the competition in local loops by giving other operators access to end users against the quality of the services they might offer to the consumers.

5.2.1.3 Main Issues on WLL Technology

In Brazil, the WLL technology offers wireless fixed-line telephony services at a frequency of 1.9Ghz. One of the main advantages of this technology is the low cost of network installation compared to fixed-line facilities. This allowed the mirror companies

to start up their operations in record time. Vésper, for example took only one year to set up its network and to offer the first services to customers in São Paulo. After 12 months in operation, the company has 630,000 subscribers in its two competing regions (Northeast and Sao Paulo).

The main disadvantage of WLL technology at the moment is that it has less capacity for data transmission than fixed-line networks. However, several manufacturers and cellular R&D companies have already launched products with increased data transmission capacity. Vésper currently offers a capacity of 14.4 Kbps and has already finalized a deal with Lucent to increase this figure to 144 Kbps by the end of 2001. The transmission capacity of a copper line is 56 Kbps. In comparison, fixed-line operators have offered residential subscribers data transmission services at speeds of between 128 Kbps and 2 Mbps with ADSL (Asymmetric Digital Subscriber Line).

As far as corporate customers are concerned, the mirror companies have had to adopt a different strategy to meet demand. In Sao Paulo, Vesper has joined forces with AT&T Latin America to offer voice transmission services to its corporate clients. AT&T provides the fiber optic infrastructure and Vésper the sales force, customer service and, most importantly, lower tariffs and a wider range of services than Telefonica (incumbent operator in this market).

This partnership has proved beneficial to both parties. Vesper can compete directly with the main players in the corporate market for voice transmission services as well as benefit from the use of AT&T's existing fiber optic infrastructure. The company can, therefore, concentrate it efforts on sales and marketing, while increasing its market

share and consolidating its name as an efficient and reliable operator. On the other hand, AT&T can optimize the use of its network, thus ensuring a better ROI. It is worth remembering that without this partnership with a fixed-line operator, AT&T would not be able to offer voice transmission services.

However, the main problem that Vesper faces in terms of expanding its services in the corporate segment is the fact that it does not have yet its backbone installed and therefore cannot compete in all major regions in the segments of data transmission and Internet access. The company is currently constructing its backbone and is studying wireless alternatives for the local loop, such as BWA – multipoint technology with a data transmission capacity of 3 Mbps.

On the other hand, the main advantage of WLL technology is that it can offer mobility to its customers. The only restriction at the moment is the regulatory environment in the Brazilian sector, which does not allow fixed-line operators to offer mobile services to its customers. However, deregulation of the telecommunications sector is expected to be complete by 2002; and operators should then be able to offer a wider range of services and to provide the same to customers outside their concession areas. Thus, after sector deregulation, the mirror companies will be better positioned to offer an integrated service package to its customers.

Another important issue involving the WLL and the carriers is the pricing strategy. Due to the relatively high cost of the handsets for this technology, carriers offering WLL lines have to decide whether to heavily subsidize the terminals in order to maintain their competitiveness, or to cut activation prices and recuperate on monthly fees. Ultimately, consumers will base their choices of carrier on price, quality and

availability of services. As availability is becoming less of an issue, and WLL cannot compete in terms of quality, pricing becomes a critical matter for any operator offering WLL services. Therefore, when comparing drivers of WLL adoption with this technology's quality issues, it becomes apparent that "this technology is more attractive to operators than to customers" [21]. Consequently, WLL operators cannot expect a high churn rate from conventional fixed lines, especially if prices of both are similarly positioned.

One possible, and not cheerful future scenario for the Brazilian carriers that are deploying this WLL networks, is that the technology becomes obsolete with the rapid growth of new fiber networks and the arrival of new fixed access technologies. In this situation, the mirror telcos will progressive replace their WLL network with conventional high-speed infrastructure in the areas where the heavy users are concentrate, transferring their WLL towers to more remote regions.

5.2.2 Wireless

The mobile telephony segment in Brazil is relatively new, having only really made any impact in the mid 90s when some Telebras operators first offered cellular services. With the government's decision to privatize Telebras, the mobile segment became an independent market from fixed line services and developed a profile of its own.

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21 The Yankee Group Report. The WLL Experience In Brazil; Vol. 1, no. 8 - June/2000.

According to the privatization model proposed, Brazil was divided into 10 cellular regions, with at least two operators competing in each market – divided between Bands A and B. The auctions for Band B were held in April 1997 and Band A in July 1998 (the same date the Telebras system was privatized). However, while the winning Band A operators started up their operations almost immediately, Band B companies only began operating at the beginning of 1999.

Growth in the cellular segment in Brazil has been impressive, mainly due to the level of pent-up demand; cheaper handsets, and lower call charges after Band B went into operation. The following figure shows the growth and the penetrations rates in the Brazilian market.

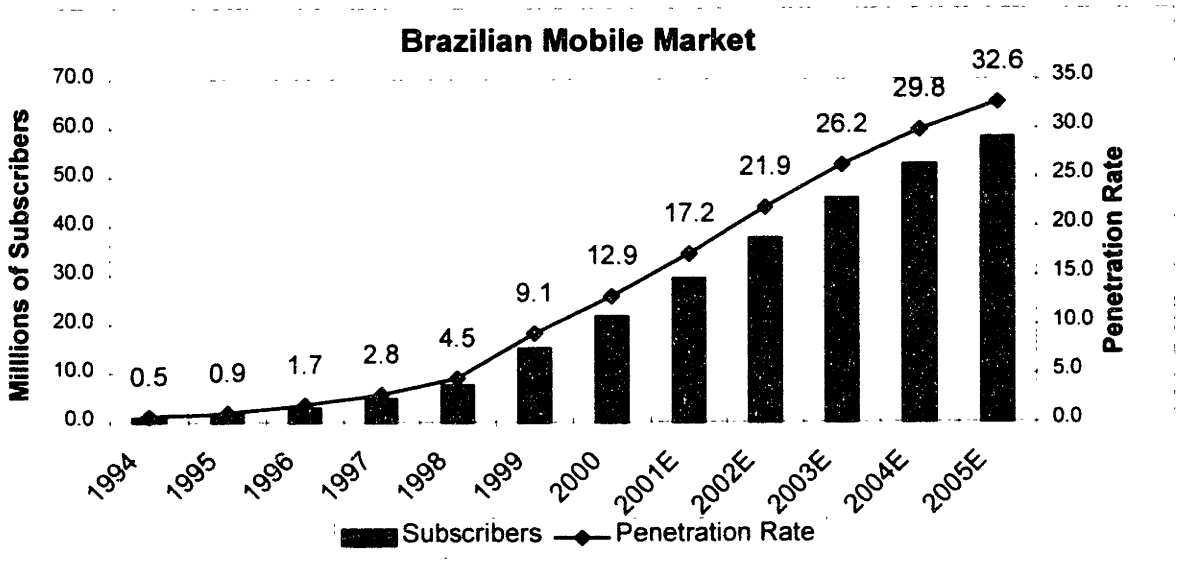

Figure 5.2 – Evolution of Brazilian mobile market [22]

22 ANATEL's Prediction. www.anatel.gov.br

Competition in the cellular segment in Brazil increased significantly when the Band B operators started up their operations in January 1999. The majority of the new competitors found it hard to compete with the dominant companies. Yet, some of them, such as BCP in São Paulo and ATL in Rio de Janeiro, could achieve a significant market share in their regions due to the constrained demand; however, already at that time, the customer acquisition cost was already very high.

The use of digital technology allowed cellular operators to offer a range of fancy services previously unavailable to users in Brazil such as call identification, message recording services, call transfers and access to Internet.

During 2001 ANATEL will proceed with the auction of nine PCS (Personal Communications System) licenses, taking the Brazilian cellular sector into a new phase of competition – the PCS model will be further described later in this chapter. By the end of year 2001, when the new Band C operators are expected to start up their commercial operations, there should be at least three operators competing in each of the existing cellular regions. After deregulation in January 2002, when Bands D and E operators will enter in the market, there may be as many as five cellular operators in each region.

The entry of new players and the consequent increased level of competition should force tariffs down and squeeze operators' margins, and should more than likely result in cost reductions and sector consolidations, reducing the overall number of cellular operators.

Despite their brand name and client relationship, the incumbent operators (Band A and B), will also suffer from reductions in tariffs and margins; however, the major

obstacle to competing successfully in this market will be faced by new players. To ensure a relevant market share, these new companies will have to spend more on their acquisition costs for new subscribers and can expect a lower return from them as the level of penetration in the higher income groups is already close to the limit.

One thing that is expected from these new players is technology evolution. The industry is preparing for creating a convergent standard that will enable more sophisticated applications such as wireless data and video transmission using broadband channels, mobile commerce, etc. The following figure shows how the sector is planning to achieve this new technology status.

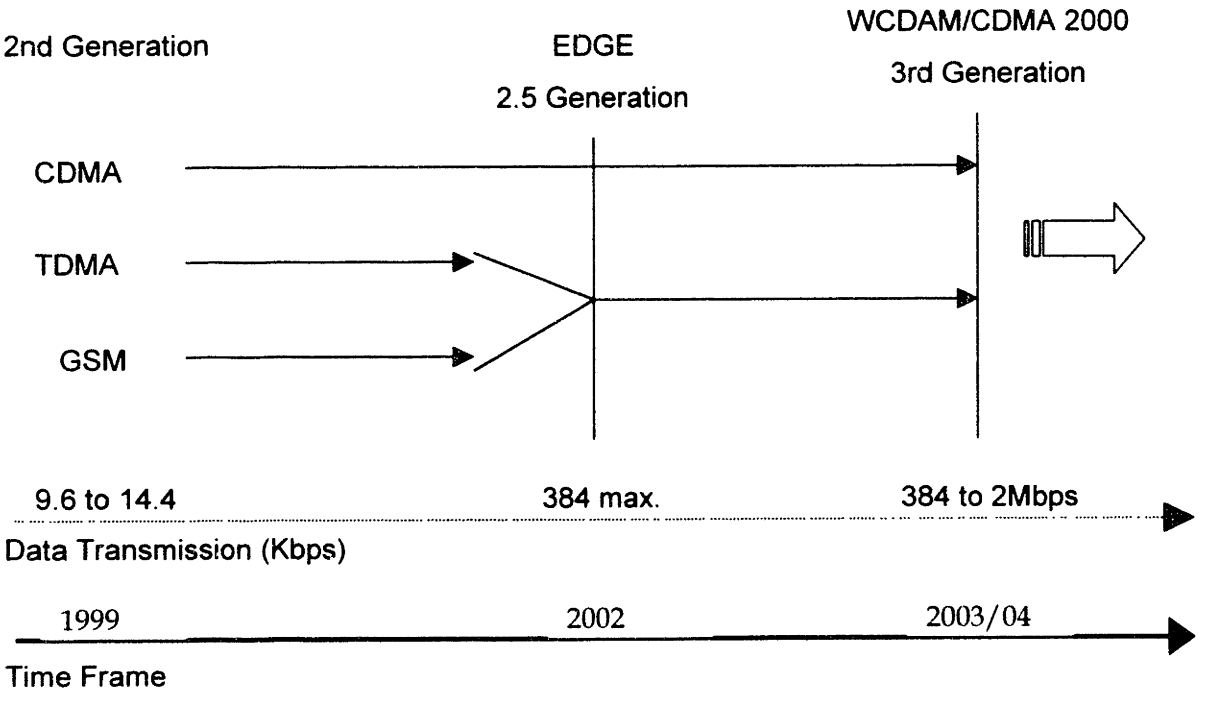

Figure 5.3 – Wireless Technology Evolution [23]

23 Websites: Ericsson and Nokia.

It is worth to mention that the bands A and B wireless carriers in Brazil adopted the CDMA and TDMA standards, whereas the GSM standard will be adopted by the new licensees (bands C, D, and E). The first step towards converge will be between TDMA and GSM technologies through the implementation of the intermediary standard EDGE – Enhanced Data Rates for GSM Evolution. The full convergence will take place with the third generation, where the users of two different standards (WCDMA and CDMA 2000) will experience fully compatibility.

However, the adoption of these new technologies by the Brazilian operators will depend on the demand and on the customer purchase power in the different geographic regions. Thus, the previsions are that the country will keep in pace with the technology evolution until the 2.5 generation; while the deployment of the 3rd generation will probably be left to a more distant future.

5.2.2.1 PCS – The Expansion of the Brazilian Telecommunications Market

In order to expand and upgrade the wireless telecommunications service in Brazil, the country's telecommunications regulator, ANATEL, has decided to auction nine licenses to operate PCS. The introduction of PCS should contribute to increased competition in wireless service with the potential entry of up to nine new players, as well as with the end of price regulation. Also, the implementation of the PCS regulatory framework will be a catalyst for free competition throughout all the segments in the telecommunications market, expected to begin in 2002, as it will allow the same operators to provide wireline and wireless services.

The main characteristics of this new system are as follows [24]:

- The frequency chosen was 1.8 GHz, which favors the GSM system.
- The country was divided into three areas, aligned with the existing fixed-line regions.
- Three new licenses will be available in each area – Bands C, D and E.
- Band C is not open to existing fixed-line operators, their controllers or subsidiaries.
- Cellular operators can bid in the Band C auctions in any region as long as they sell off any Band A or B they might have in the same region, so as to avoid any overlap between cellular and PCS licenses.
- Band D is available to both fixed-line operators that reach their universalization targets in advance and to their controllers, as well as cellular operators. Subsidiaries and controlling companies may bid for the same license. However, if related parties make the two highest bids, ANATEL can call on the third-highest bidder to take part in the auction.

The main implications of the PCS model proposed by the Brazilian regulatory body are:

1. The possibility of mergers between cellular operators: ANATEL will allow cellular operators to merge as long as the companies involved migrate from concession to authorization (i.e., move towards the PCS model). The regulator has made it clear that it intends to consolidate the telecommunications sector in Brazil according to

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24 ANATEL - www.anatel.gov.br

the regional divisions made for fixed-line and PCS operators. Consequently, it will be easier to integrate fixed and cellular companies; and cellular operators will have the chance to benefit from gains in scale by merging their assets in these regions.

2. The possibility of integrating cellular and fixed-line services: as previously explained, fixed-line operators can acquire Bands D and E. This allows these companies to offer packages of integrated services to their customers.
3. Deregulation of the long distance cellular segment: with the change from concession to authorization, long distance cellular calls will no longer be exclusive to cellular operators. Consequently, cellular users can choose between fixed-line and cellular operator to complete their long distance calls. To do this, cellular operators also will have the right to a long distance license and a dialing code.
4. End of tariff regulations and interconnection agreements made by ANATEL: for operators that migrate to the PCS model, ANATEL will no longer interfere in interconnection agreements between companies.

Undoubtedly, the proposed PCS model — which allows both mergers and the debut of the wireline companies in the cellular business — will play a very important role in the consolidation process that will take place in Brazilian telecom market. The increasing competition should also ensure lower tariffs and better products for the customers, which is, by far, ANATEL's major concern.

5.2.3 Internet

The Brazilian Internet market is also passing through an intense consolidation process, and its characteristics of having numerous competitors and lacking long-

established market leaders are changing. The rapid growth, a shift away from access fee–based revenue models to alternative revenue streams, a dynamic and competitive environment fueled by the involvement of telecom and media conglomerates, and rapid consolidation characterize the Brazilian market at this time.

Brazil's nearly 4.0 million Internet subscribers (in the year 2000) represent half of all Latin American subscribers, and the number of new accounts should more than double in the year 2001. The Yankee Group expects that the number of total users will reach 30.4 million by 2005, translating to a household penetration rate of over 56% [25].

The restructuring of the Brazilian telecommunications industry and consequent arrival of competitive local players are also contributing to the improvement of last-mile connections, and this will ultimately increase Internet penetration beyond high-income market segments. This has attracted significant competition, investments, and Internet services improvement, which will ultimately encourage adoption. The model of provision free Internet access, in particular, has forced the pace of development in the Brazilian Internet industry. Portals and ISPs have been forced to grow alternative revenue sources like advertising to compensate for the loss of access revenues. In order to grow these alternative revenue sources, they have sought to expand their user bases as rapidly as possible, while expanding service provision to match.

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25 Yankee Group Report. Investing in the Brazilian Internet Industry; Vol. 1, no 10 - July 2000.

5.2.3.1 Market Characteristics

Although Brazil is a very large country, its most promising markets are very concentrated. The majority of the population in Brazil lives in urban areas, and almost two-thirds live in the country's 10 largest cities— such as Sao Paulo, Rio de Janeiro, Belo Horizonte, Porto Alegre, Curitiba, Brasilia, etc. In addition, the five wealthiest states produce almost three quarters of Brazil's GDP, though the potential of smaller states should not be underestimated. But generally, the most promising markets are easy to identify, and their attractiveness is enhanced by the fact that Brazilians are quick to adopt new technologies.

Historically, the Internet market in Brazil has been left to the private sector. It is generally unregulated because it is considered a value-added service and therefore not subject to the General Telecommunications Act. For this reason an excessive number of ISPs entered the market in 1996 and 1997. Three years ago there were over 1,200 ISPs in Brazil, but according to the Brazilian ISP association (ABRANET), these numbers decreased to roughly 321 as of June 1999. A clear indication that this trend towards rapid consolidation process will continue is the estimation that not more than 10 major ISPs will be competing in the Brazilian market in the next two years.

The telecommunications regulator in Brazil does not allow the carriers that provide local services to offer Internet access directly. These players can only offer Internet services through subsidiaries, because they have to guarantee the same access to lines and interconnection to all other ISPs. This regulation prevents the carriers from offering free Internet access while cashing in on the extra pulses

generated by the consumer, and from providing easier access to infrastructure to their own ISP subsidiary or affiliate. Still, this regulation has not prevented Telcos from entering the industry. For example, Telefonica, a fixed-line operator servicing the state of São Paulo, recently purchased 51% of ZAZ, the second most important ISP and portal in Brazil; Telemar has the control of IG (a major portal in the Internet free-access space); and Portugal Telecom has a stake in UOL, the biggest Brazilian ISP and portal.

This regulation plays an important role in promoting competition in the market. It was not designed to exclude the Telcos from the Internet business; rather, it prevents the carriers from monopolizing the provision of Internet services by using their inherent competitive advantage—their last-mile infrastructure.

The presence of Brazilian financial institutions, media conglomerates, and telecommunication companies since the inception of the Internet in the country also shaped the market in an interesting way. Early Internet ventures were acquired by these businesses and let to grow; subsequently the companies were incorporated into the major corporations, playing now an important role in their e-commerce strategies.

In an important divergence from the U.S. model, financial institutions in Brazil have led the way in integrating Internet applications and services into their businesses models. For example, Bradesco S.A. offers a sophisticated portfolio of home banking products, was the first major Brazilian player to offer free Internet access, and was one of the first to develop its wireless Internet strategy. Other major banks did not get behind: most now offer Internet access services, have aggressively pursued online banking strategies, and have begun to offer a range of other e-commerce billing options as well, including e-cards and "electronic wallet" services.

In addition to the role of financial institutions, another important characteristic of the Brazilian market is the high concentration of telecom and media conglomerates in the Brazilian Internet industry. The ubiquitous presence of major telecom companies and media conglomerates has had an impact on the Brazilian Internet market in two important areas:

- Backed by generous corporate pockets, many of the young Internet companies have been able to maintain a very high capital burn rate in a escalating competition, especially through pricing.
- The significant participation of media conglomerates has guaranteed that some portals have diverse and substantial content offerings, which it is crucial to consumer attraction and retention.

5.2.3.2 Drivers of Growth and Barriers to Overcome in the Brazilian Internet Market

The major factors contributing to the development of the Brazilian Internet industry are market liberalization, the falling cost of access, and the growth of local content, particularly in specific e-commerce applications such as banking.

The primary driver of Internet growth in Brazil is the liberalization process in the communications industry. The entry of private capital, expanded and improved local infrastructure, improved access and quality of voice telephony, and a wider array of service options due to increased competition were important aspects that truly benefited the establishment of a vigorous Internet industry in the country.

The falling cost of Internet access fees is also a major contributor to the growth of Internet adoption in Brazil. As a result of an intensified competition among ISPs, monthly access fees have decreased and service packages have become more generous. This is important because the increased Internet usage among middle and lower-income segments of the population is critical to the Internet's growth in the country, given that the high-income level is a already an user for a long time.

But the most significant driver for future Internet growth in Brazil is, perhaps, the increasing availability of quality local content. This positive development is in part related to the ownership interests behind the country's dominant ISPs. Two media conglomerates, Grupo Abril and Folha de Sao Paulo, own the main ISP in Brazil, Universo Online (UOL). This has allowed UOL to quickly improve local content by posting and commercializing its parents' magazines and newspapers on the Internet.

Because most of UOL's content is restricted to its customers, its competitors, especially the search engines and other portals, have invested a great deal in alliances with other nationwide and local newspapers and magazines in order to provide similar content to their users free of charge.

In spite of these developments, Internet user penetration is still low mainly due to a three specific factors: low connection speeds (averaging below 28.8 Kbps; low PC penetration, especially in the middle and low-income segments of population; and still a poor last mile infrastructure and scarcity of fixed lines.

The arrival of new competitive access providers and competitive exchange carriers is already improving the local bandwidth bottleneck and last-mile infrastructure, leading to improved access for residential and corporate end users alike. Improved

infrastructure, higher telephony penetration, and lower access fees are expected to drive Internet popularity during the next years in the Brazilian market.

5.2.4 Data Transmission Segment

The privatization of the Telebras System was aimed at creating pure players in the segments of data transmission and long distance telephony capable of operating throughout national territory. Embratel currently has the largest network for both long distance and data services in Brazil, which means that it has been successful in keeping the largest corporate customers in the country on its books as far as data transmission is concerned.

However, the sector has seen a vast increase in the number of operators entering the market over the last few years, and the fiber optic network infrastructure has been expanded significantly, both by existing fixed-line operators and by the new players in the market. Fixed-line operators have been increasingly focusing their attention on the data transmission segment. The high margins that Embratel has achieved in this segment and the relative ease of duplicating their networks has led both fixed-line operators and other companies to invest in these services. Most recently, the Yankee Group publicized that investment of approximately US$10 billion has been allocated for development in the Brazilian telecommunications sector over the next two years specifically for the construction of fiber optic networks [26].

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26 Yankee Group Report. It is Built on Time in the Brazilian Corporate Networks Market; Vol. 1, no 4. May 2000.

There are three main reasons for the current and expected growth in the sector, despite the high installation costs associated with the services using fiber optic networks:

1. Rising demand for broadband services. The Yankee Group also estimates that the demand for data services should support a national network of more than six million kilometers of fiber optic installed before 2002.
2. The existing level of margins associated with these services is high. Due to the growing demand for data transmission services and Internet access, and the low level of competition in these segments at the moment, broadband service providers have reported far higher margins in Brazil than in other regions around the world.
3. Relatively protected market, since high interconnection cost incurred by fixed-line operators in the data transmission and long distance segments keeps competition away.

As the regulations stipulate that fixed-line operators are only authorized to complete national long distance calls, they have confined their networks to the states in which they operate, leaving Embratel to make the investments necessary to provide the interconnections between concession areas. Local operators should continue to be entirely dependent on Embratel's network to connect national long distance calls until their networks are fully operational. This has led to substantial costs associated with interconnection fees in this segment.

Consequently, the immediate need to provide data transmission services throughout Brazil at prices competitive to those offered by Embratel has led the fixed-line operators (Telemar, Tele Centro-Sul and Telefonica) to adopt a strategy that

involves joining forces in a consortium to level the playing field for voice and data transmission services and to avoid using Embratel's network as far as possible.

Another factor contributing to the decision by local fixed-line operators to invest heavily in their network facilities is the imminent deregulation of the telecommunications sector in 2002, which should allow these operators to offer a complete range of services. It is also worth to point out that it makes all the sense for the fixed-line operators to expand their national and data transmission networks, as the cost is partially compensated by the reduction in interconnection fees that they currently pay Embratel. In fact, Embratel currently handles 80% of the Internet traffic carried over its network but the company already has less than 30% of the fiber optic network in Brazil. Before the end of 2001, Telemar is expected to have a similar size network to Embratel. There is no doubt that competition is likely to increase unfriendly in the data transmission segment in the near future mainly due to two factors:

- The possibility of offering packages of services: With the deregulation of the telecommunications sector, ANATEL has stipulated that operators reaching their targets for universalization after 2002 can offer an extended range of services outside their concession areas. Consequently, these operators can offer their subscribers integrated service packages, which means that they should be able to compete for increasingly larger percentages of corporate expenditure on telecommunications.
- Access to the end user: local fixed-line operators have the advantage of already having access to corporate users. Other service providers should have to weigh up

the installation costs involved in competing in this segment against the expected return. If they reach the conclusion that the ROI is too low, an obvious solution would be to use the infrastructure already in place and pay the associated interconnection fees to the local operator concerned.

The construction of new data transmission networks is being concentrated in the large metropolitan regions, mainly in the south and southeast, particularly the cities of Sao Paulo, Rio de Janeiro, Belo Horizonte, Curitiba, Porto Alegre, Brasilia, Salvador and Campinas, which account for approximately 80% of the corporate users in Brazil.

When it is taken into account the estimates of the Yankee Group that demand for installed fiber optic cable will require 6 million kilometers before 2002; the projections for a total of 88,000 kilometers of underground cable and 8.8 million of installed fiber optic network; other complementary means of data transmission such as satellite and wireless broadband technology; and the total investment already being made by operators to expand their networks, the conclusion is that the installed capacity of fiber optics in Brazil should be more than able to meet the expected demand for data transmission within the next two to three years. Therefore, as estimated by researchers at Santander Central Hispano [27], the increase in competition and the excess installed capacity of fiber optic network in Brazil in the near future could lead to a reduction in prices (around 30% per year) and, as a result, lower profitability for telecommunications companies operating in this segment.

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27 Picking the Winners In Troubled Water. Latin America Equity Research - Santander Central Hispano - January 2001

Chapter 6: Conclusions - From uncertainties to industry scenarios

6.1 Introduction

Worldwide the telecommunications sector is under an unprecedented level of mergers and consolidations. The main driving forces behind these trends are competition and convergence. The Brazilian market is not behaving differently from the others; on the contrary, the post-privatization regulations and the big numbers of players in the markets are additional forces that make the consolidation an inevitable result in the near future.

The booming growth of the Brazilian telecom sector, as evidenced by the charts 5.1 and 5.2 early presented, testifies to the success of Telebras' breakup and privatization. However, the technological evolution and dynamics of the telecom sector make adjustments in regulations unavoidable. The decision to break up the country into ten cellular and three wireline regions and create a duopoly for a limited time was necessary to draw the maximum number of investors and to ensure that the development of telecommunications services was even throughout the country.

With the introduction of new technologies and operators in the sector, there is a necessity for scale and move towards full-service operations, which would not only allow existing operators to lever off their infrastructure to produce additional revenues, but also dilute operating costs. With this goal in mind, ANATEL developed the new PCS model — auctioning new licenses with larger coverage areas — allowing current

cellular players to merge within the three macro-regions. Additionally, existing regulations allow wireline and long distance operators to enter all regions and provide all services if they are able to meet their entire coverage and service obligations by the end of the year 2001.

These two aspects, the PCS model designed to overlap the coverage area with the fixed lines and the break of the duopoly model leading to a full competition environment, are the regulatory and technological background that will enable the process of expansion — organic or via acquisition — for the main players in the Brazilian telecommunications industry and will drive, ultimately, to the consolidation process in the industry. The figure 6.1in the next page is a framework that shows the forces in action that will substantially change the competitive scenario in the near future.

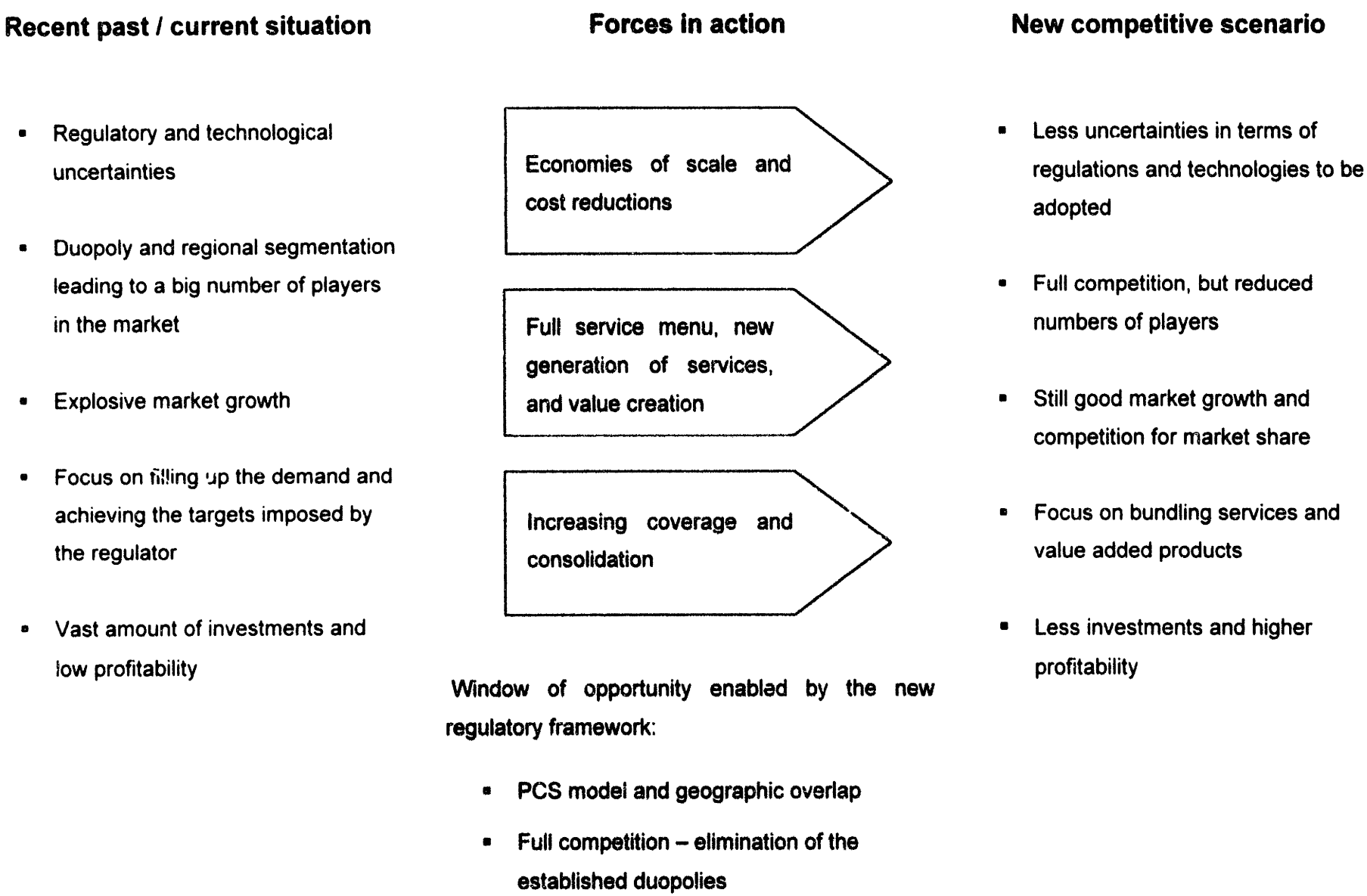

Figure 6.1– Framework for the new competitive scenario in the Brazilian telecommunication industry.

6.2 Industry Consolidation

6.2.1 Main Drivers for Consolidation

As shown in the Figure 6.1, there are three main drivers for shaping the new competitive scenario and defining the expected consolidation process in the Brazilian telecom sector.

Economies of Scale and Cost Reductions: Similarities in services and processes and standardization of tools and equipments make economies of scale significantly higher in the telecommunications sector than in most other industries. Integration of key operations, such as purchasing, marketing and billing systems, can significantly cut operating costs. Larger companies are able to negotiate better deals with vendors since they order in bulk. One of the most significant benefits is reduction of personnel, especially higher and mid-level management, which represent a disproportionate amount of labor expense.

Full Service Menu and Value Creation: The ability to bundle services is not only a powerful marketing tool for telecommunications companies, but also a low-cost way of providing an array of telecommunications services. Telcos despite separating itself into wireless, data, and wireline companies, shall coordinate its marketing of services in a way that the customer is unable to recognize that it is a series of separate companies providing different services. Not only does the company provide a one-stop shop, but also it is able to lever off existing infrastructure (points of sales, brand management,

billing systems, and network), thus becoming more cost effective. Though being a full-service operator is a desirable goal for all Brazilian companies, in practice it may be difficult or even impossible for some operators to achieve this goal.

Increasing Coverage: One of the ways to achieve economies of scale is to extend the service geographically. However, there are other benefits for expanding the coverage. For a telecommunications operator, the larger the coverage area, the higher the chances of terminating calls that it has originated on its network. This results in cost savings as the company saves the expense of terminating its calls. By the same token, the larger the coverage area, the greater the likelihood of terminating calls originated on other networks, thus resulting in higher revenues.

6.2.2 Dynamics of Consolidation

While the Brazilian telecom sector as a whole should benefit from consolidation as it unlocks synergies and economies of scale, benefits to individual companies will depend on how well they are able to increase coverage and service menu. Operators wishing to expand coverage or service menu have three basic options: build, buy, or merge (although mergers other than within subsidiaries under the same parent group are difficult to happen at this early stage of the consolidation process). In each situation there are some key considerations that will impact the consolidation process.

It is more or less predictable that the cellular companies will by and large seek to expand only their coverage and few will enter other services unless they become a part

of a large group (such as, Telefonica or Telecom Italia); whereas long distance companies that already have national coverage may selectively expand into new services, such as providing local services to its corporate long distance clients and may participate in the PCS auctions if the price is economically justifiable. Local carriers, on the other hand, are the only companies that plan to increase not only their coverage, but also their service menu. All three wireline companies — Telemar, Brasil Telecom, and Telefonica — have already communicated their intention of expanding nationwide to provide data and long distance services. Also, all three definitely plan to bid for the PCS license in their own local regions and may even do so in other regions in partnership with other investor groups.

The key decision for operators seeking service menu expansion in Brazil is whether to do it through buying existing assets or building them from scratch. Apparently, most service menu expansion by operators within their regions can be done cost efficiently by building on existing infrastructure. A good example for this is wireline operators buying PCS licenses in their own region to provide wireless services. New wireless services can lever off, among others, wireline companies' billing systems, switching stations, points of sales, and rights of way. Similarly, if a long distance carrier decides to provide local services, it can use its existing last-mile infrastructure, which currently provides only long distance services.

On the other hand, coverage expansion can be done in a timely and cost-efficient manner by acquiring existing assets. Local telcos should be very active in increasing their coverage in Brazil. The most likely scenario is expansion of wireline companies into data, wireless, and long distance services in new regions.

However, for wireline companies penetrating new regions can be very difficult, since the Brazilian wireline market is going to saturate very soon. The only wireline market still to be captured would be the high-end data/corporate services market in large cities. Given the rapidly increasing competition in this market segment, time to market is mandatory. Acquisition of an existing operator not only dramatically reduces the time to market, but also eliminates a competitor. In Brazil, this strategy makes all the sense because entry of wireline companies into other regions is contingent on meeting network and service obligations. Thus, wireline companies cannot take the risk of developing a network in a new region, in which they may not be able to operate. This is exactly why Telemar, for instance, has taken up a stake in Pegasus, a data company, whose nationwide network will be used to provide data and long distance services once ANATEL allows it to expand.

The local players may have an advantage in this game, because it is easier for them in Brazil to evolve into full-service operators than it is for cellular or long distance companies to do the same. This advantage reflects the following [28]:

- Brazilian local companies are generating considerably more cash flow and have lower leverage than their wireless and long distance counterparts, making it easier for them to fund new businesses.

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28 Consolidation - Solving the Puzzle Emerging Markets Equity Research - Bearns Stearns January 2001

- Developing wireless and long distance infrastructure is relatively less capital-intensive than wireline infrastructure. Adding cellular services to an extensive wireline infrastructure further reduces the capital required. The high capital intensity of wireline networks serves as a barrier to entry.

- Expected high growth in the Brazilian wireless market and availability of licenses makes entry into the sector easier and economically feasible. On the other hand, the wireline market in Brazil at present is close to saturation levels and, thus, offers little economic incentive for new entrants.

- The vast terrestrial infrastructure of local companies makes it easier for them to add on extra services, compared with wireless and long distance companies. Control of last mile is a significant advantage the local companies have over long distance operators. Wireless companies can potentially overcome that hurdle by providing wireless local loop services, however, this technology has not yet been proven on a mass scale.

For a wireless operator wishing to enter new regions, the choice is to buy the PCS licenses or existing operators. PCS licensees will be the third, fourth and fifth operators in the market, where most of the second players (band B operators) are already having a hard time surviving. Thus, one important point here is to analyze the economic reasoning behind the transaction. Unless an operator has a distinct advantage over its competitors, such as having a wireline network in that region or having a nationwide license, it can be difficult to operate profitably. Some carriers already mentioned that even paying the minimum price; start-up operations might not

be adequately profitable given the expenses for implementing the system and the inevitable very high costs associated with customer acquisitions.

To sum up, there is no doubt that a huge consolidation process is going to take place in the Brazilian telecommunications market, given all the synergies and strategic reasons earlier mentioned. In fact, one can say that the process is already under way – Portugal Telecom, the owner of Telesp Celular, recently acquired Global Telecom (a wireless operator in the South of the country) and, subsequently, merged all of its operations with Telefonica Mobile, creating the biggest wireless company in Brazil. It seems, also, that the results of the bands C, D, E auctions will play a crucial role in dictating which operators will remain in the market and lead the consolidation process.

In the end, no matter who will be the winners and what degree of consolidation is reached, the expectation from the regulatory agency (and from the whole Brazilian society as well) is that end users will have smother and higher quality services, experiencing a telecommunications system technologically updated and at a very reasonable costs.

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