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INTERNATIONALIZATION WITHIN THE TELECOMMUNICATIONS INDUSTRY THE CASE OF DEUTSCHE TELEKOM

By

John Ernest Bennett

A THESIS

Submitted to Michigan State University in partial fulfillment of the requirements for the degree of

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ABSTRACT

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Most research on the internationalization of firms has focused primarily on manufacturing and extraction industries and not on service-type industries such as telecommunications. Within the telecommunications service industry stagnant home markets, liberalization and increased competition have prompted many companies to internationalize their operations seeking profits outside of their home market. This report outlines the internationalization process of telecommunication companies in general and focuses on one company, Deutsche Telekom, the German national carrier, in particular, in its efforts to become a global player. Copyright by JOHN ERNEST BENNETT 1996 This is dedicated to my wife, Laura.

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TABLE OF CONTENTS

| LIST OF TABLES | viii |
|--|----------|
| LIST OF FIGURES | ix |
| INTRODUCTION | 1 |
| | |
| THE INTERNATIONALIZATION PROCESS | 4 |
| General Concepts | 4 4 |
| Patterns in the Traditional View | 5 |
| Modes of International Involvement | |
| Telecommunications as a Technology-based Service Industry | 7 |
| Foreign Direct Investment in the Context of Internationalization | 10 |
| Recent Research Findings | 12 |
| Strategic Alliances in the Context of Internationalization | 18 |
| Internationalization Model for Telecommunication Companies | 19 |
| CHAPTER 2 | |
| INTERNATIONALIZATION OF TELECOMMUNICATION COMPANIES - | |
| INFLUENCING FACTORS | 23 |
| Historical Context | 23 |
| Global Trends of Regulatory Reform | 25 |
| United States | 25 |
| United Kingdom | 26 |
| Japan | 26 |
| European Union | 27 |
| Technological Development | 29 |
| Internationalization of Customers | 29 |
| Increasing Global Competition in Telecommunications | 30 |
| Political Changes in Central and Eastern Europe | 31 |
| | |
| CHAPTER 3 | |
| THE CASE OF DEUTSCHE TELEKOM | 33 |
| Introduction | |
| Deutsche Bundespost | 34 |
| I ne Problems | 35 |
| Regulatory Reforms. | 37 |
| Postal Reform 1 | 3/ |
| The Role of Telekom - what really has changed ? | |
| Concrete Steps of Reformation | |
| Tailli KCSUUCIUIIIg Dostal Deform II | 41 42 |
| rusial Refutilit II | 42 |
| Telekom 2000. The East is Debuilt | 43 AE |
| I CICRUIII 2000 - I IIC EAST IS REDUIIT | 43 |

| Positive Impacts of the Reform Process | |
|--|---|
| Deutsche Telekom's Foreign Direct Investment | |
| Deutsche Telekom's Firm-Specific Advantages | |
| Deutsche Telekom's Internalization-Specific Advantages | |
| Location-Specific Advantages | |
| Deutsche Telekom's Internationalization Strategy | |
| 200000000000000000000000000000000000000 | |
| CHAPTER 4 | |
| DEUTSCHE TELEKOM'S INTERNATIONAL JOINT VENTURES AND STRATEGI | С |
| ALLIANCES 53 | Ŭ |
| Fastern European and Central Asian Joint Ventures 57 | |
| Austria 57 | |
| Czech Pepublic 57 | |
| Uungery 57 | |
| Dolond 59 | |
| FUlanu | |
| UKIAINC | |
| $\bigcup I E L J0$ | |
| UKRAINIAN MUBILE CUMMUNICATIONS | |
| Belarus | |
| Kussia | |
| MOBILE TELESY STEMS (MTS) | |
| ROSCOM (50x50 Project) | |
| MOBILE SYSTEM LICENSES | |
| RTK60 | |
| Kazakstan60 | |
| DEKATEL | |
| KAZTELECOM60 | |
| Indonesia61 | |
| Singapore | |
| International Joint Ventures and Cooperative Agreements | |
| Romantis | |
| Eunetcom | |
| Global European Network | |
| Trans Europe Line (TEL) | |
| Trans Asia Europe Line (TAE) | |
| Atlas | |
| International Strategic Alliances | |
| Global One | |
| | |
| CONCLUSIONS | |
| APPENDIX A | |
| BIBLIOGRAPHY | |

LIST OF TABLES

| Table 1 - Classification of Service Industries | 9 |
|---|------------|
| Table 2 - The Internationalization of Telecommunication Companies into Eu | rope13 |
| Table 3 - The Internationalization of Telecommunication Companies into S. | E. Asia 14 |
| Table 4 - The Internationalization of Telecommunication Companies into S | America15 |
| Table 5 - The Internationalization of Deutsche Telekom | 54 |
| Table 6 - Global One Partnership Milestones | 65 |

LIST OF FIGURES

| Figure 1 - Major Determinants of Internationalization in Telecommunications |
|---|
| Figure 2 - The Internationalization Model for Telecommunication Companies |
| Figure 3 - Deutsche Bundespost's Profit and Loss per Division in 1986 |
| Figure 4 - Average Wait Time For Installation, 1986 |
| Figure 5 - Deutsche Telekom's Internationalization Over Time |
| Figure 6 - Austria: O-Call Joint Venture |
| Figure 7 - Czech Republic: Digital Mobile Telephone Joint Venture |
| Figure 8 - Hungary: MATÁV (Hungarian Telecommunications) Joint Venture |
| Figure 9 - Poland: Polska Telefonia Cyfrowa (PTC) Joint Venture73 |
| Figure 10 - Ukraine: UTEL Joint Venture |
| Figure 11 - Ukraine: Ukrainian Mobile Communications Joint Venture |
| Figure 12 - Belarus: Belarus Telecommunications Joint Venture |
| Figure 13 - Russia: Mobile Telesystems (MTS) Joint Venture |
| Figure 14 - Russia: Roscom (50 X 50 Project) Joint Venture |
| Figure 15 - Russia: GSM Mobile Telephone System Joint Venture |
| Figure 16 - Russia: RTK Equity Investment |
| Figure 17 - Kazakhstan: Dekatel Joint Venture |
| Figure 18 - Kazakhstan: Kaztelekom Joint Venture |
| Figure 19 - Indonesia: Satelindo Joint Venture |
| Figure 20 - Singapore: Cooperative Agreement |
| Figure 21 - International: Romantis Joint Venture |
| Figure 22 - International: Eunetcom Joint Venture |

| Figure 23 - International: | Global European Network | 87 |
|----------------------------|------------------------------|----|
| Figure 24 - International: | Trans Europe Line (TEL) | 88 |
| Figure 25 - International: | Trans Asia Europe Line (TAE) | 89 |
| Figure 26 - International: | Global One Joint Venture | 90 |

INTRODUCTION

Within the last decade there have been profound changes within the telecommunications industry worldwide. As companies in the manufacturing industry and financial institutions began to look beyond their national borders and to internationalize their operations so the demand for international telecommunication services has increased. Faced with stagnant growth at home, either due to a mature market or as a result of regulation limiting the types of business activity allowed, telecommunication companies have sought to grow their businesses by following their customers abroad and have been investing in new foreign markets at an unprecedented pace.

There has been much research conducted on the internationalization of companies. This research, however, has focused mainly on manufacturing companies, and not on service companies, such as telecommunications. The research presented here seeks to investigate the internationalization of telecommunication companies, to develop a conceptual framework that defines this process, to define contextual factors influencing this process and to compare the research findings with an actual test case, i.e. Deutsche Telekom. The questions that this research seeks to answer include: What is the process of internationalization of telecommunication companies? What are the contextual factors influencing the process? And finally, how does Deutsche Telecom compare to the model developed?

There are different types of telecommunication companies. For example, there are telecommunication equipment manufacturers as well as local telephone, long distance, and value-added service companies. Telecommunication equipment

manufacturers have been active internationally for a number of years. Only recently have traditionally domestically focused local telephone companies (e.g. the regional Bell operating companies in the U.S. and other national providers including France Telecom and Deutsche Telekom, the French and German national carriers respectively) sought business internationally primarily through foreign direct investment, joint ventures and strategic partnerships. The research presented here focuses on this recent expansion abroad.

Chapter 1 details the internationalization process in general. The traditional view is presented including the Uppsala and Innovation Models of international expansion. This research is then broadened to include service industries including telecommunications. The idea of telecommunications as a technology-based service industry with unique constraints on the internationalization process is presented.

Foreign direct investment (FDI) plays a prominent role in the expansion of telecommunication companies overseas. According to Dunning's "Eclectic Theory", (1981), there are three factors that determine when a firm chooses to invest in a foreign company: e.g. firm-specific, internalization-specific, and location-specific. These factors are discussed in the context of telecommunication companies. Specific research on the internationalization of telecommunication companies is also presented.

Alliances play a prominent role in the foreign direct investment noted in the research. The various alliance strategies are discussed and differentiated. The role of equipment suppliers are also discussed. The chapter concludes with a summary of the theoretical model for the international expansion of telecommunications companies.

Chapter 2 provides the context within which the internationalization process of telecommunication companies has occurred. There are a number of influencing factors that are shaping this process. Global trends of regulatory reform, technological innovation, internationalization of customers, increasing global competition in

telecommunications, and political upheavals in Central and Eastern Europe have been the main catalysts.

Chapter 3 introduces and gives a comprehensive overview of Deutsche Telekom, the German national telecommunications carrier. As a typical PTT (Post, Telegraph and Telephone) fully owned by the government, Deutsche Telekom, inheriting a huge bureaucracy, has faced a daunting challenge of becoming more competitive and customer-focused. As European Union-wide deadlines approach for introducing competition in basic telephone service (the local loop) and infrastructure provision, the German government has been active in reforming the telecommunications market and reorganizing Deutsche Telekom to be more competitive to be able to become a global player in the telecommunications industry. The chapter concludes with a look at some of the factors that are contributing to the company's foreign direct investment and its internationalization strategy. Chapter 4 provides a synopsis of the data collected on the international expansion of the company through foreign direct investment and strategic partnerships. Data for the case study was collected from numerous published sources, company documents, and the Internet throughout the process of completing this work. Prior to beginning this research, the author spent time in Europe including Germany and was a customer of Deutsche Telekom.

Chapter 1

THE INTERNATIONALIZATION PROCESS

General Concepts

The term internationalization generally means the process of expansion of a market or a company's operations from a national to a more international focus and participation. It could also describe the outcome or state of that process at any particular time (Bohlin and Granstrand, 1994). Depending on the industry, internationalization could be viewed from a competitive perspective. If competition is localized, e.g confined within national borders, and products are unique to each area, the industry serving each region could be considered a multi-domestic industry (Porter, 1986). If competition is not localized, e.g. having a broader even global scope, and the same products can be used in multiple areas, industries serving more broader regions across different countries would be considered global. Globalization, therefore, is the process of increasing interdependence of competition across various countries (Bohlin and Granstrand, 1994). Multi-domestic industries would include, for example, retailing, health care, sports, entertainment, food, publishing, clothing, and personal care products. Global industries would include pharmaceuticals, automobile, chemicals, construction equipment, medical equipment and telecommunications.

Multinational corporations (MNC) are corporations that have achieved a certain level of business activity in multiple countries. There is still a certain amount of autonomy between the corporate organizations in each country and between markets. As the differences between markets diminish, e.g. products become attractive in multiple countries and the organization begins to view markets and strategies on a broader basis, these companies could be considered transnational. When a corporation takes an

internationally integrated and worldwide view of its location decisions in order to take advantage of coordinating on a worldwide scale, these corporations would be considered global (Bohlin and Granstrand, 1994).

Patterns in the Traditional View

The traditional view of international expansion has evolved out of two schools of thought: the Uppsala Model, named after the university in Sweden where the theory was originally developed, and the Innovation Model, a conceptualization of several scholars from North America (Knight & Cavusgil, 1996). Both theories primarily focused on the international expansion process of manufacturing firms. According to Johanson and Weidersheim-Paul (1975), the researchers who developed the Uppsala Model, firms follow four distinctive stages of gradually increasing foreign involvement on their way to becoming fully internationalized. These stages are:

- Stage 1: No regular export activities
- Stage 2: Export via independent representatives
- Stage 3: Establishment of an overseas sales subsidiary
- Stage 4: Foreign production/manufacturing

The model emphasizes that the process involves an incremental approach through the acquisition, integration, and use of knowledge concerning foreign markets as well as successively increasing commitment to those markets (Knight & Cavusgil, 1996). As a company explores new markets, more and more knowledge is acquired and integrated into the firm's competitive strategy. This knowledge then enables it to expand into other markets. The theory assumes that the process of learning occurs primarily through personal, on-site experience, and that management will not commit more and more resources without this incremental personal knowledge.

Expansion into other markets follow a pattern. According to Johanson and Vahlne (1977), the firm will enter new markets with increasingly greater psychic distance, where psychic distance is defined as aspects of language, culture, business practices, and industrial development which tend to reduce the efficiency of information flows between the firm and the market. The model, therefore, assumes that a firm will first choose markets that are more familiar and that they understand best. Only later, when there is sufficient knowledge and experience will the firm expand into more culturally dissimilar markets.

The process of internationalization, according to the Uppsala Model is a slow and gradual process. Johanson and Vahlne (1990) emphasize that the slowness of the process, due to the incremental nature of acquiring knowledge, may be sped up considerably under one or more of the following conditions: (1) when the firm is large, possessing substantial resources which minimize the consequences of rapid commitment; (2) when market conditions are homogeneous and stable, making application of existing knowledge relatively straight forward; and (3), when the firm has significant experience with similar markets, permitting wholesale transfer of relevant knowledge.

The Innovation Model of internationalization, based upon the work of Bilkey and Tesar (1977), Cavusgil (1980), Czinkota (1982), and Reid (1981), regards the process as resulting from a series of management innovations that occur within the firm. According to Bilkey and Tesar (1977), the stages in this process are as follows:

- Stage 1: Management is not interested in exporting.
- Stage 2: Management is willing to fill unsolicited orders, but makes no effort to explore the feasibility of active exporting.
- Stage 3: Management actively explores the feasibility of active exporting.
- Stage 4: The firm exports on an experimental basis to some psychologically close country.
- Stage 5: The firm is an experienced exporter.
- Stage 6: Management explores the feasibility of exporting to other more psychologically distant countries.

Cavusgil (1980) summarizes the major research findings on the internationalization process and makes three conclusions. First, internationalization is a gradual process, progressing in incremental stages, over a relatively long period of time. Each stage reflects increasing commitments of resources and managerial talent. Second, initial involvement in exporting and subsequent steps toward greater internationalization can be viewed as innovations within the closed environment of the firm, not unlike adoption of a new production method. Third, firms appear to internationalize without much rational analysis or deliberate planning.

Modes of International Involvement

There are various modes through which companies can pursue international involvement. As indicated in the last section, international involvement tends to progress in a number of stages, so, therefore, the mode is dependent upon which stage the company is in. The most common mode of international involvement is export, either directly from the home market or through a foreign distributor. If a product cannot be exported efficiently due to size, weight, character, or other internal factors, the company has the option of licensing its technology to foreign partners as a way to begin the internationalization process. Licensing is a way to minimize the company's risk. If the product is a service, such as a restaurant, franchising is a more common method.

As a company matures in its international involvement, it may choose to establish subsidiaries in key markets to export and sell its products. This allows the company to be closer to its customers and be in a position to respond more readily to customer concerns. If the company continues its internationalization process and sees a strategic need for production facilities closer to key markets, it may choose to directly invest in facilities to provide this capability. This investment, referred to as foreign direct investment (FDI) could be in a joint venture, in the purchase of an existing firm (in part or wholly) or in new facilities.

Telecommunication as a Technology-based Service Industry

Most of the research presented so far has focused on manufacturing industries that create physical products that are sold. The internationalization of service industries is a special case and has unique characteristics. Service industries typically do not have products to sell, rather they offer expertise and knowledge. According to Bohlin and

Granstrand (1994), internationalization of service industries is less developed than internationalization in manufacturing industries. According to Dunning (1991), foreign direct investment (FDI) in services follow rather than lead FDIs in manufacturing industries. Management consultants, banks, insurance companies, travel agents, hotels, telecommunications, etc. comprise what would be considered service industries.

The telecommunications industry is unique in that it is a service industry dependent upon a physical network infrastructure. In some sense it relates to manufacturing industries in that it is capital and technology intensive. A technologybased service industry is, therefore, an industry that provides services, the provision of which requires technology to a considerable extent (Bohlin and Granstrand, 1994). This technology can be embodied, e.g. in a network, or disembodied, e.g. in the technical knowledge of a computer consultant. Table 1 classifies service industries according to their technology and capital intensity. You will notice that telecommunications is high on both counts.

As a network industry, telecommunications could be considered an *intermediate service*, in that it is not directly consumed but is embodied in final products or other services (Dunning, 1989). Telecommunication is used, for example, to connect customers with suppliers, e.g. to place orders, arrange shipment of products, etc. In this context it facilitates the transaction and is, therefore, an intermediate service. In the residential context, however, it would be a final service.

Telecommunication services comprise technological knowledge embodied in its transmission lines, switches, computers, databases, etc. as well as managerial knowledge which allows services to be conceived and implemented (Johansson, 1994). Unlike other network-embodied services such as gas, electricity, and water which provide a service with one "variant", telecommunication services offer an infinite number of variants (Johansson, 1994). For example, water, gas and electricity all come in one flavor, so to

| Capital Intensity | apital Intensity Technology Intensity | | |
|-----------------------------------|---|---|---|
| | High-tech Services | Low-tech Services | "No-tech" Services |
| High Capital | Telecom Services | Rescue services | Rental Services |
| Intensive Services | Medical Services (surgery, etc.) | Entertainment | Hotels and Accommodation Services |
| | Surveillance and security | Retailing/wholesale | Religious Services |
| | services | Gambling | |
| | Defense Services | Disposal Services (sewage, garbage, etc. | |
| | Energy Services Transportation Services | Water Supply | |
| | | Financial Services etc. | |
| Low Capital Intensive Services | University and Higher Educational Services | Entertainment | Social Services |
| Intensive Services | Consultancy Services (engineering, data, etc.) Medical Services etc. | Financial Services | Insurance Services |
| | | | Restaurants |
| | | | Consultancy Services (management, legal, advertising, accounting etc.) |
| | | Police Services | Travel Agencies Cleaning, Housekeeping |
| | | | |

Table 1 - Classification of Service Industries

Source: (Bohlin & Granstrand, 1994)

speak, whereas telecommunications services are offered in many different flavors. At home, you can have residential voice service alone (basic service) or have the basic service with a multitude of other services including caller ID, call back, voice mail, etc. which are referred to as value-added services. In the business context, value-added services could include data transmission, electronic mail, virtual private networks, etc.

In discussing the internationalization of telecommunication companies, it is important to remember the nature of this business, i.e. offering services upon a network infrastructure. Each country or region has distinct regulatory and market characteristics that determine when and how telecommunication companies can expand. National telecommunication carriers have had bilateral agreements for a long time that defined how their individual networks would interconnect and how the traffic would be billed. Only recently, as regulatory constraints have been lifted, have telecommunication companies begun to enter each other's market as competitors or allied themselves in strategic partnerships. The next section discusses the role of Foreign Direct Investment in these partnerships.

Foreign Direct Investment in the Context of Internationalization

Foreign direct investment (FDI) plays a prominent role in the internationalization process. FDI is defined as a monetary transfer from one country to another intended for the purchase of another company or manufacturing facility (in whole or part) or for the construction of new facilities. Dunning (1981) proposes three conditions that need to be met for a company to invest abroad. His "Eclectic Theory" defines these three areas as "firm-specific factors", "internalization-specific factors", and "location-specific factors."

Firm-specific factors comprise the firm's assets including knowledge, technology, management skills, capital, and access to resources. These assets provide the foundation upon which the company is competitive. *Internalization-specific factors* determine if the company needs to keep these assets within itself, in effect, internalizing them, instead of

selling or leasing them abroad. Services that require internalization usually are knowledge intensive and could be considered a core competency. By safeguarding these strategic competencies internally, the company is in a stronger position to be able to achieve the advantages from internationalization, e.g. to be in a stronger position to negotiate joint ventures, and to work with consortia on projects requiring large investments. Working in a consortium helps the company to share the costs among the partners. *Location-specific factors* influence where a company invests. These factors including market size, political stability, local resources, etc. reveal to the company how long they may expect to grow their business in the chosen country (Dunning, 1981).

Within the telecommunications industry, recent evidence shows that there is an increasing number and amount of FDIs (Johansson, 1994). As home markets mature or are confined through regulation, telecommunication companies are motivated to seek profits abroad (Bagchi-sen and Das, 1995). According to Kurisaki (1994), FDIs can take on a number of forms. They could comprise purchasing shares in a telecommunications operator, establishing a joint venture, obtaining a license or franchise for the operation of telecommunication services, or merging with or acquiring providers of telecommunication services other than telecommunications operators.

Telecommunication services are classified as either basic or value-added. The form of FDI chosen depends upon which type of service will be offered. As we will see in Chapter 2 there are a number of factors that influence the choice of FDI. Most prominent of these factors is the regulatory environment of the country where the investment will take place. Many governments have required FDI as a precondition to becoming a domestic service provider. Some countries limited the foreign ownership to under 50 percent. In Poland and Hungary, for example, foreign investors were not allowed, initially, to have a majority stake (Bennett, 1995, April)(Bennett, 1995, December) and had to find local partners.

There are a number of advantages companies are seeing in FDIs. The main advantage is that it provides direct presence or influence in the target country. Companies are closer to their customers in this way and can respond more readily to market changes. Another advantage is that FDI allows a company to become globally known in a relatively short period of time. Within the context of telecommunications, FDI has allowed companies to rapidly enter a telecommunications market (Kurisaki, 1994) and to internationalize. The next section discusses this rapid expansion among telecommunication service operators.

Recent Research Findings

As was mentioned in the last section, FDIs have generally been increasing in number. Over the last ten years within the telecommunications industry, there has been a surge of growth and interest in internationalization. A number of factors have contributed to this growth including a worldwide trend of regulatory reform which has opened formerly monopoly services to competition. (**Chapter 2** discusses this in more detail.) Prior to this period there was minimal internationalization going on.

In his look at the internationalization activities of 25 telecommunication companies, Johansson (1994) has found some interesting patterns. (see **Tables 2, 3 & 4**)¹ Johansson documents the activities of telecommunication companies into three regions including into Europe, South East Asia and into South America. For Europe, he has limited the list to companies active in at least five countries in the region. For South East Asia, he limits the list to companies active in at least three countries. For South America, he limits it to companies active in at least two countries.

The first pattern found was that there were early entries into one of the major markets in a region in the late 1980s. According to Johansson (1994), the main reason

¹Johannson's research focuses on the internationalization into three regions, European countries, South East Asia and Australian countries, and Latin American countries. The level of internationalization is the total number of projects rounded to the nearest 5.

| Telco | I | <1986 | 1986- 1987 | 1988-1989 | 1990-1991 | 1992-1993 |
|---------------------|----|-------|---------------|--|--|---|
| вт | 30 | | | France | Austria, Belgium, Czech, Denmark, Germany, Ireland, Italy, Netherlands, Spain, Sweden, Switzerland | |
| Cable & Wireless | 50 | | | Germany | France, Ireland, Italy, Poland, Russia, Spain, Sweden | Belgium, Germany, Latvia, Netherlands, Switzerland |
| DBP Telekom | 20 | | | Netherlands, UK | Austria, Belgium, Czech, France, Hungary, Poland, Romania Russia, Slovakia, Switzerland | Belarus, Denmark, Estonia, Finland, Italy, Kazakhstan, Latvia, Lithuania |
| France Télécom | 35 | | | Germany, Belgium, Italy, Switzerland, UK | Czech, Denmark, Finland, Germany, Hungary, Iareland, Luxemburg, Netherlands, Norway, Poland, Portugal, Romania, Russia, Sweden | Canada, Greece, Spain |
| PTT Telecom | 10 | | | Germany | Belgium, Czech, France, Sweden, UK | Bulgaria, Ukraine |
| Telia | 10 | | | | Denmark, Estonia, Finland, France, Latvia, Netherlands, Norway, UK | Hungary, Russia, Switzerland |
| Ameritech | 20 | | | UK | Austria Denmark, France, Germany, Italy, Netherlands, Poland Spain, Switzerland | Norway |
| Bell Atlantic | 15 | | | Austria, France, Germany, Italy, Neth., Switz., UK | Belgium Czech, Russia, Spain | Ireland, Norway, Sweden |
| Bell South | 20 | | France, UK | Switzerland | Belgium, Denmark, Germany, Netherlands, Poland | |
| NYNEX | 20 | | France, UK | Gibraltar, Netherlands | Belgium, Czech, Germany | |
| Pacific Telesis | 10 | | | Germany, UK | Portugal | Belgium, Denmark, Spain, Sweden |
| U.S. West | 20 | | | Czech, France, Hungary, Neth., UK | Belgium, Bulgaria, Germany, Lithuania, Malta, Norway, Poland, Romania, Russia, Sweden, Ukraine | |
| AT&T | 40 | UK | | Ireland, Russia | Austria, Belgium, France, Germany, Italy, Poland, Netherlands, Russia, Spain, Sweden, Switzerland, UK | Denmark, Ireland, Kazakhstan, Portugal, Ukraine |
| Sprint | 35 | | | Germany, Netherlands, Switzerland, UK | Austria, Belgium, Denmark, Finland, France, Ireland, Italy, Norway, Portugal, Russia, Spain, Sweden | Poland |

 Table 2 - The Internationalization of Telecommunication Companies into Europe

I = Level of Internationalization, approximately rounded to closest five. Source: (Johansson, 1994)

| Telco | I | <1986 | 1986- 1987 | 1988-1989 | 1990-1991 | 1992-1993 |
|----------------------|----|-------|---------------|-----------------------------------|---|--|
| KDD | 20 | | | South Korea, Singapore | Australia, China, Hong Kong, India, Malaysia, North Korea | Cambodia |
| Singapore Telecom | 15 | | | Japan | Australia, Hong Kong, Malaysia, Mauritus, Sri Lanka, Thailand | China, Vietnam |
| Telstra | 20 | | Vietnam | | Cambodia, Hong Kong, Japan, Laos, Malaysia, New Zealand, Pakistan, the Philippines, Thailand | India, Indonesia, South Korea, Singapore, Taiwan |
| BL | 30 | | Japan | | Australia, Hong Kong, Thailand | Indonesia, Malaysia, New Zealand, the Philippines, S. Korea, Singapore, Taiwan |
| Cable & Wireless | 50 | | Japan | | Australia, China, South Korea | |
| France Télécom | 35 | | Japan | China, Indonesia, Singapore | Australia, Bangladesh, Cameroon, S. Korea, Thailand | Hong Kong, India |
| Bell Atlantic | 15 | | | | Indonesia, New Zealand, South Korea, Taiwan | Japan |
| Bell South | 20 | | Australia | China | India, New Zealand | India |
| NYNEX | 20 | | | China, South Korea | Australia, Hong Kong, Indonesia, Japan, the Philippines, Singapore, Taiwan | Thailand |
| AT&T | 40 | | | Hong Kong, Japan, S. Korea | Australia, China, Indonesia, New Zealand, the Philippines, Singapore, Taiwan | |
| MCI | 60 | | | New Zealand | China, Japan | Australia |
| Sprint | 35 | | Japan | South Korea | Australia, Cambodia, Guam, Hong Kong, Malaysia, Singapore, Taiwan, Thailand | China, Indonesia, Sri Lanka |

| Table 3 - The Internationalization | of Telecommunication | Companies into S. E. Asia |
|---------------------------------------|----------------------|---------------------------|
| 1 duit 5 - 1 mc miter muteron miteron | | |

I = Level of Internationalization, approximately rounded to closest five. Source: (Johansson, 1994)

| Telco | I | <1986 | 1986- 1987 | 1988-1989 | 1990-1991 | 1992-1993 |
|---------------------|----|-------------------|---------------|---------------------------|---|---------------------------------|
| Cable & Wireless | 50 | Caribbean (16) | | | | |
| France Télécom | 35 | | | Mexico, Venezuela | Argentina, Brazil | |
| Telefónica | 10 | | | Chile | Argentina, Venezuela | Puerto Rico |
| STET | 15 | | | | Argentina, Brazil, Chile | |
| Bell South | 20 | | | Argentina, Puerto Rico | Mexico, Chile, Uruguay, Venezuela | |
| GTE | 15 | | | Brazil | Mexico, Venezuela, Dom. Rep. | |
| AT&T | 40 | | | Mexico, Columbia | Brazil, Ven e zuela | |
| MCI | 60 | | | | Mexico | Brazil, Columbia, Venezuela |
| Sprint | 35 | | | | Brazil, Mexico, Guatemala, Puerto Rico | Mexico, Argentina, Venezuela |

Table 4 - The Internationalization of Telecommunication Companies into S. America

I = Level of Internationalization, approximately rounded to closest five. Source: (Johansson, 1994)

for this early entry, prior to any regulatory reform and liberalization, was that telecommunication companies were following large multinational customers as they expanded abroad. This seems to confirm Dunning's (1991) conclusion that foreign direct investment (FDI) in services follow rather than lead FDIs in manufacturing industries.

Another pattern regards the facilitating factor of technological development in networks, e.g. digitization, cellular, etc. as well as in services. New technologies were being developed that allowed services to be offered that bypassed traditional solutions of the national telecommunications carrier (PTT - Post Telegraph and Telephone). In many countries, licenses were being offered to take advantage of these new technologies.

Looking at regulatory reform and liberalization of markets reveals another pattern in internationalization. Many of the 25 telecommunication companies, took any and all opportunities to invest abroad. Wherever liberalization opened up an opportunity, many companies sought after that business. According to Granstrand and Johansson (1993), companies seem to have been following a "trial and error" strategy when internationalizing. This seems to confirm Cavusgil's (1980) research that firms appear to internationalize without much rational analysis or deliberate planning.

Johansson (1994) also looked at the driving forces that are encouraging telecommunication companies to internationalize. (see Figure 1) According to Johansson (1994), one main driving force is changed customer demand. As was noted earlier, telecommunication companies followed their multinational corporations abroad. These customer began to demand more global services including virtual private networks, etc. Another main driving force is the liberalization of telecom services. The last main driving force encouraging telecommunication companies to internationalize is the technological development in networks and services. **Chapter 2** will discuss these factors in more detail.



Figure 1 - Major Determinants of Internationalization in Telecommunications

Ruhle (1995) has looked at the driving forces of 223 internationalization attempts by 23 carriers to enter foreign markets by foreign direct investment (FDI) in the installation and operation of fixed telecommunications markets. Using Dunning's Eclectic Theory he has tested a number of hypotheses and has come up with some interesting results. There are a number of *firm-specific*, or using his terminology, ownership specific advantages (O) that contribute to the explanation of internationalization. These include revenue development (e.g. when there is dynamic development and performance improvements of their service business in their home market), cash flow, range of service provision, the degree of private ownership of a telecommunications operator (e.g. companies having higher private ownership are more likely to pursue international opportunities), previous international activity and the location of target markets (e.g. investments are geared to specific regions and depend more on geographical adjacency rather than on traditional, cultural, political or economic factors (psychic distance)). All of these factors influence the process of internationalization. Interestingly enough, size of revenues, number of main lines installed, revenue per employee, main lines per employee, debt ratio, ability to meet demand, network digitization, and, as was mentioned, psychic distance were all found not to have any influence on the internationalization process.

Ruhle's research did not focus on internalization factors (I), which are complex to analyze, but did highlight some location-specific (L) advantages that contribute to the internationalization process. For example, when a company has experienced competition in their home market or knows that there will soon be competition by some specified date, this company will much more likely pursue international opportunities. In the bidding process, Ruhle's research found that companies favor open and transparent regulatory processes. The other location-specific factors that are influencing the internationalization process include the GDP per capita abroad, the length of the waiting list and the direction of international telephony traffic. The one location factor found not to be influencing the foreign entry process is the market structure of the target country.

Bauer (1995, "The anatomy...") has also analyzed the entry patterns of a number of telecommunication companies and has identified three strategies of international

involvement that are followed, sometimes in parallel. The first strategy is *service diversification*. As market liberalization began to allow companies to lease lines and provide value-added services, companies began to enter into bilateral agreements with local telephone operators to provide international voice or value-added services. In markets where the network facilities are important for high quality service, such as the markets for corporate services, carriers such as AT&T, BT, Cable & Wireless, MCI or Sprint, began to use a second strategy of building their own (global) backbone networks and securing a presence in important international markets. Other satellite-based consortia, e.g. Iridium or Inmarsat, are following a similar strategy. According to Bauer (1995, "The anatomy..."), these strategies, so far, have led to limited cross-penetration of foreign markets via foreign direct investment, maintaining the predominantly national structure of the industry.

In light of the continuing gradual liberalization of telecommunication services, the most recent strategy identified by Bauer (1995, "The anatomy...") is the increasing direct approach of foreign direct investment, joint ventures, and alliances that mark the beginning of a more significant cross-penetration of national markets. With this strategy, dominant or monopoly carriers, such as Deutsche Telekom, are taking a more prominent role. Of 190 recent projects by 20 different carriers, Bauer has found that 23.2% target Asia, 21.6% target Eastern Europe and the Newly Independent States (NIS), 18% focus on Western Europe, 16.8% target South and Central America, 8.4% target Australasia and Oceania, 7.9% focus on North America (mostly Canada), and only 3.7% of the projects focus on Africa and the Middle East.

Strategic Alliances in the Context of Internationalization

As Bauer notes (1995, "The anatomy..."), the liberalization of the telecommunications market is increasing foreign direct investment and market cross-penetration. Strategic alliances are playing a major role in this activity. A strategic

alliance is defined here as any cooperative agreement between two or more companies that is designed to mutually benefit each participant, e.g. to gain technological expertise, market access, etc. These agreements can be equity or non-equity based with long or short-term objectives. As we will explore in the next chapter, global competition is influencing the process of internationalization within the telecommunications industry. Companies are aligning themselves with companies in other markets to able to offer global services. Many of the national carriers and the RBOCs do not have the international network nor the capital to create networks to be able to offer global services. So many are seeking partners that complement their own services and/or provide access to desired markets. This cooperation allows the members to achieve "critical mass" within the market and take advantage of business opportunities that they would otherwise not be able to pursue alone.

Telecommunication manufacturers, such as Siemens, have had some role in strategic alliances and joint ventures, but not major roles. As we will explore in Chapter 4, Siemens is an equity partner with Deutsche Telekom in two of a total 22 projects studied. As a major supplier to Deutsche Telekom, they are still benefiting indirectly from the other projects.

Internationalization Model for Telecommunication Companies

From the research presented in the previous sections, a conceptual model of internationalization of telecommunication companies can be formulated (see Figure 2). There are a number of firm-specific factors that greatly influence the decision to internationalize. Management support in the form of the commitment of staff and resources is important for the expansion. Revenue development and cash flow to fund the effort are also key factors. The greater the range of service provision in the home market the more likely the company will seek opportunities abroad to offer similar services. Market knowledge of the target market and market opportunities are also



Figure 2 - The Internationalization Model for Telecommunication Companies



Figure 2 - The Internationalization Model for Telecommunication Companies

important to be able to take advantage of opportunities. Previous international activity is also a key factor in the internationalization process. The more experience a company has internationally the more likely the company will seek further opportunities.

There are also contextual factors that are influencing the internationalization process. For example, global trends of regulatory reform/liberalization, technological development, increasing customer demand for international services and the internationalization of customers, increasing competition globally and in the home market, and major political changes (e.g. in Eastern and Central Europe) are all influencing and affecting the internationalization process. (Chapter 2 discusses these contextual factors in more detail.)

The outcome of the internationalization process has taken on a number of forms. Telecommunication companies are pursuing a number of strategies to internationalize their operations. Foreign direct investment is prominent among them. The various investment strategies include purchasing shares in a telecommunications operator in the target country, establishing a joint venture, obtaining a license or franchise for the operation of telecommunication services, and merging with or acquiring providers of telecommunication services.

Strategic alliances have also been prominent. By aligning with partners in important markets, national and local carriers are coordinating their efforts to provide services that are global in scope. By working together, these alliances attempt to complement each other's technical and management expertise, to gain access to closed or restricted markets as well as achieve "critical mass" in the marketplace. Together, these alliances are able to take advantage of opportunities the individual companies could not otherwise pursue.

In comparing the internationalization of telecommunication companies with the "Traditional" model there are some similarities. The process of internationalization has

been incremental. Rarely were multiple projects started at the same time. Expansion required management approval and an ever greater amount of resources. Another similarity is that telecommunication firms internationalize without much rational analysis or deliberate planning, it has been more of a "trail and error" strategy.

The differences between the "Traditional" and the "Telecom" models comprise the pace and place of internationalization. The "Traditional" model says that the pace of internationalization is a slow gradual process dependent upon the increasing acquisition of foreign market knowledge. The "Telecom" model, however, reveals a rapid pace of internationalization. The "Traditional" model also says that companies expand into familiar markets that they understand first and later into more culturally divergent markets, e.g. "psychic distance" According to Ruhle (1995), expansion has been geared more to specific regions (e.g. Europe, Asia, South America) and depends more upon geographical adjacency rather than on traditional, cultural, political or economic factors (psychic distance).

It will be argued in Chapters 3 and 4 that Deutsche Telekom fits this "Telecom" model of internationalization remarkably well. But first, in Chapter 2, the influencing factors on the internationalization process will be discussed in more detail.

Chapter 2

INTERNATIONALIZATION OF TELECOMMUNICATION COMPANIES -INFLUENCING FACTORS

The internationalization process of telecommunication companies is being influenced by a number of factors. These factors together have shaped and are shaping the patterns of internationalization globally. The historical context gives the backdrop to the global regulatory reforms that are taking place. With the pace of technological network development as well as the pace of internationalization in other sectors, there is increasing global competition in telecommunications. Carriers are joining together in strategic alliances to meet this competition and to be able to meet the present and future needs of their global customers. Political changes around the world are also influencing and providing market opportunities. The fall of Communism in Central and Eastern Europe has given many telecommunication companies the opportunity to expand into these emerging markets. We will discuss these factors in more detail below.

Historical Context

After Alexander Graham Bell patented the telephone in 1876, there were a number of private companies that offered telephone service in many countries. After the Bell patents expired in 1893-1896, a great deal of competition was generated. The Bell Company from this period on attempted to increase its control over much of the networks in the U.S. and Canada. It eventually became the monopoly provider in most areas. The Bell Company, later renamed AT&T, also operated some networks abroad, but was forced to transfer its holdings to ITT in 1925 by agreement with the U.S. government (Bohlin & Granstrand, 1994).

In Europe and other parts of the world, after some initial private attempts at setting up and running telephone networks, most were nationalized around the turn of the century and became agencies of the respective governments. In Germany, the telephone system was first run by the military and was considered a national security concern. In Austria, the system was at first private, but due to poor quality was later nationalized. After being nationalized, the telephone network was typically integrated into existing postal and telegraph offices. This organizational structure became known as the PTT (Post, Telegraph, and Telephone) model and was common throughout Europe. Another wave of nationalizations occurred during the 1940s - 1960s mostly in developing countries.

There are a number of distinct differences between the U.S. "model" and the PTT "model". Besides the fact that one promotes private ownership and the other public ownership, each has and is influencing the internationalization process. With private ownership and monopoly status, AT&T in the U.S. and the Bell Company in Canada were gradually regulated by first local, state and later federal agencies. The Federal Communications Commission (FCC) was founded by the Communications Act of 1934 in growing concern over AT&T's power as a monopoly and as a means to insure the social goal of "universal service". The regulatory and operational functions of telecommunications were, therefore, separated.

With the PTT model on the other hand, regulatory and operational functions were not separate. It was a part of the government and subject to political influences. As a lucrative business, telecommunications often became a "cash cow" subsidizing other less efficient governmental agencies. As a government agency, social goals of infrastructure provision, industrial policy, e.g. nurturing national industries and champions, were much easier to accomplish and to coordinate.
Global Trends of Regulatory Reform

Many countries are in the process or have already reformed regulations governing the provision of telecommunication services. Market liberalization (e.g. the introduction of competition), corporatization (e.g. the reorganization of a state agency into a corporate structure), and privatization (e.g. the selling off of state-owned companies) are the key reforms being implemented. Initial partial liberalization has led to further pressure to liberalize. This environment of regulatory reform has encouraged telecommunication companies to look internationally for opportunities to expand. As international markets have opened up, telecommunication carriers have gone after these opportunities. In the following sections we will look at a number of key countries or regions that have begun the regulatory reform process.

United States

Reform first began in the United States in 1959 when spectrum was first opened up for corporate microwave systems (Bauer, 1995). During the 1960s and 1970s into the early 1980s, the pace of reform continued with the introduction of competitive services and the breakup of AT&T in 1984 into a long distance company and equipment manufacturer and the Regional Bell Operating Companies (RBOCs). The terms of the breakup limited the business activities of the RBOCs which ultimately led many to pursue growth opportunities internationally. Competition was introduced in the long distance market as well as in the customer premise equipment (CPE) market. Reform has continued in the United States with the recent passage of the Telecommunications Act of 1996. This act opens up competition in the local loop (e.g. local telephone service) as well as frees up some of the major limitations on the RBOCs' business activities albeit with certain competitive safeguards. The act eliminates the separation of cable, telephone, and wireless communication companies and allows competition between each. The RBOCs are now allowed to offer video and wireless services. Cable companies can

now offer telephony services, etc. Since its passage there have been a number of strategic alliances and mergers announced.

United Kingdom

British Telecom, the national carrier, was a typical PTT owned by the government. As a government agency, it had all the typical PTT problems. Reform first began in the United Kingdom in 1969 when telecommunication services were separated from the Post Office and later during the early 1980s. During this later period, regulatory and operational functions were separated and competition was introduced. A regulatory body, OFTEL (Office of Telecommunication), was created and in 1981, British Telecom was corporatized and given a mandate to seek opportunities abroad. Corporatization is the process of transforming the PTT into a structure semi-autonomous from the government. The new corporate entity may still be government owned, but it controls its own managerial and administrative functions (Noam & Kramer, 1994). An international division was also established. Cable & Wireless, the overseas service carrier was also privatized. A division of Cable & Wireless, Mercury Communications was established to compete with British Telecom in the local loop. In 1984, British Telecom was privatized. Since reform began, a number of the RBOCs have taken advantage of the liberalized market and began trials of video service. Since the passage of the Telecommunications Act of 1996 in the U.S. these companies can now utilize the knowledge gained abroad in their home market. This is one benefit of internationalization.

Japan

Japan's model for telecommunications was the typical PTT (Oniki, 1993). Domestic telecommunications was provided by Nippon Telegraph and Telephone (NTT), a government organization. International services were provided by Kokusai Denshin Denwa Co., Ltd. (KDD), a quasi-private corporation. Both providers had legal monopolies for the services they provided. In 1985, NTT was privatized and was given

authority to begin international operations. The telecommunications services market, both domestic and international was liberalized and opened to competition.

European Union

Within the European context, formal telecommunications reform began with the 1987 Green Paper on Telecommunications. This document called on the member states to pass legislation that would fully liberalize the supply of terminal equipment. It called for the elimination of all restrictions on competition in value-added services, the harmonization of technical standards, the development of common principles of Open Network Provision (ONP), the separation of the operational and regulatory functions of the state telecommunication providers, the establishment of anti-competitive monitoring provisions, a unified European approach in international negotiations, and recommended monitoring the social impact of telecommunications development. It allowed, however, member states to specify certain "reserved services" including network infrastructure and "basic" services that could have special status, e.g. that could remain monopolies (Bauer & Steinfield, 1994).

Reform continued with the issuance of the Green Paper on satellites in 1990 which called for the liberalization of the earth segment for both receive-only and two-way terminals, free (unrestricted) access to space segment capacity (subject to licensing) except for reserved services (local telephony & network infrastructure), full commercial freedom for space segment providers including direct marketing of satellite capacity to service providers and users (subject to licensing), and harmonization measures that would facilitate European-wide services (Bauer & Steinfield, 1994). In 1994, the Green Paper on mobile and personal communications was issued that called for the development of a European-wide market for mobile services, equipment and terminals and to promote the evolution of the mobile communications market into mass personal communications services, with particular emphasis on pan-European services (Commission of the European Communities, 1994). Further reform called for the liberalization of the telecommunications infrastructure and cable television networks. In the Green Paper issued in 1995/1996, the European Commission called for full liberalization of the infrastructure and services by January 1, 1998 (Commission of the European Communities, 1995).

A Green Paper issued by the European Commission, actually is a legally nonbinding communication. Resolutions supporting the implementation of its provisions must be passed by the European Council and the European Parliament. It is then up to member countries to enact legislation to implement the provisions (Bauer & Steinfield, 1994). Thus, a directive is a basic guideline, the implementation of which will differ depending on the individual approaches taken in each country (Steinfield, 1994). Throughout the European Union, telecommunication legislation has been passed in most countries, although the reforms implemented vary somewhat between them. Most have acted to separate regulatory and operational functions. Some have chosen to separate the regulatory body from both the operator and the government ministry and create an independent body, e.g. in England with the establishment of OFTEL. Other countries have created the regulatory body as an agency directly responsible to the minister of communication, e.g. France (Steinfield, 1994). The liberalization of services has been implemented in varying degrees throughout Europe. The approaches range from the more liberal approach in the United Kingdom, to a more restrictive approach in France. Value-added services, on the other hand, have been opened to competition in most of the member countries. The implementation of the other Green Papers are progressing. Germany, for example, recently passed legislation that would open basic services to competition at the end of 1997. (see Chapter 3)

Technological Development

Another influencing factor contributing to the liberalization of markets and, therefore, on the internationalization process of telecommunication companies in general, is the rapid technological advancement in network architecture and software development. The convergence of computers and telephony has opened up tremendous market opportunities. Digitalization has been the one technological innovation which has transformed the telecommunications system the most during the last century. Now, digital streams of data can flow worldwide. Voice, graphics, text as well as video can be digitized and sent through fiber optic cables, microwave transmission systems or through satellite transceivers. With a digital network system interconnected worldwide, new services such as electronic mail, the Internet, virtual private networks, etc. are now possible. These new technologies have allowed new players into formerly monopoly markets. When the market has been liberalized and open to competition, foreign telecommunication carriers have often partnered with local companies to offer these new services.

Internationalization of Customers

As Johansson discovered in his research described in the last chapter, the internationalization of telecommunication customers has had a profound influence on the internationalization of telecommunication companies in general. As multinational and global corporations expand, so their needs for secure and reliable telecommunications expand. AT&T, Sprint and others, for example, expanded their international operations when some of their keys clients internationalized (Johansson, 1994). As international service options become affordable, more companies take advantage of these new technological innovations and internationalize their operations as well.

Increasing Global Competition in Telecommunications

As global regulatory reform creates more liberalized markets, telecommunication companies are experiencing or will experience more and more competition both in their home markets as well as internationally. Within the last few years, telecommunication carriers have been pursuing strategic partnerships with other national carriers to be better positioned to meet the competition at home and to be in a better position to offer global services. For example, in 1991, British Telecom tried to start the "Syncordia" service. In October of the same year, PTT Telecom (the Netherlands) and Telia (Sweden) started "Unisource" (other companies joined later including Swiss PTT and Telefonica Espana of Spain). Also In October, Deutsche Telekom and France Telecom announced a partnership, Eucom, to offer value-added network services (VANS). In March of 1992, these same partners announced a new partnership, Eunetcom, to offer business services. In May of 1993, AT&T and 8 carriers in the Pacific Rim announced the "Worldsource" service (Bohlin and Granstrand, 1994). One month later, British Telecom and MCI announced plans to offer a global service called "Concert". In December of 1993, Deutsche Telekom and France Telecom announced plans to join their international businesses in "Atlas". A year later, the Atlas partners began to court U.S. Sprint to expand the alliance across the Atlantic. The resulting alliance, "Global One" was finalized in February 1996.

As noted above, there has been a great deal of activity among the major telecommunication players. As we discussed in **Chapter 1**, the Regional Bell Operating Companies also began to internationalize and are members of a number of joint ventures in Central and Eastern Europe as well as in South America. It remains to be seen whether this process will continue at the same pace. As liberalization unfolds there will continue to be opportunities to internationalize and to compete on a global basis.

Political Changes in Central and Eastern Europe

Another influence on the internationalization process of telecommunication companies has been the political changes that have occurred in Central and Eastern Europe. With the fall of Communism in the late 1980s, the newly independent states of the former Soviet Union as well as the former Warsaw Pact countries began looking to the West both politically and economically. Tremendous market opportunities were created for telecommunication service providers and equipment manufacturers as these countries began to rebuild after decades of neglect.

Although some of the countries have economic structures similar to such middleincome countries as Portugal, Spain and Greece, their telecommunications networks resembled those of much less developed countries (Mocenigo & Paddock, 1995). Due to underinvestment over the last 45 years, the telecommunication infrastructure and services in most of the countries in Eastern Europe were in ill-repair or non-existent. Service was also very poor at best in some places. Typically, penetration rates were low and there was a huge unsatisfied demand for new service.

In East Germany, one official described the system as a patchwork of "pre-World War II switching equipment stitched together by lead-sheathed copper cables wrapped with paper insulation" (Protzman, 1992, March 11). Compared to Western standards, 70% of East Germany's central office switches were obsolete (Gronert, 1990). Incredibly, many East Germans had to wait over 20 years for installation of new service. When the two Germanys were united in 1990, there were 1.5 million unfilled applications for service. Of these applications, the oldest was placed in 1961 (Telekom reports..., 1992). It was estimated that a minimum of DM 60 billion (\$35 billion) investment would be needed to rebuild the infrastructure up to Western standards (Griffiths, 1993).

The new governments of Central and Eastern Europe wanted to attract Western investment. They set about, with the help of international monetary bodies, to begin the process of telecommunications reform and infrastructure redevelopment. The national telecommunications carrier was often corporatized and partners from the West were sought to invest in the company and to provide technical expertise. Licenses were issued for local service as well as mobile systems covering major metropolitan areas. Essentially, the redevelopment was from the ground up, so newer digital technologies were implemented. Typically a digital fiber optic overlay network and business services were implemented first. Local service expanded as revenues or investment allowed. There was usually also some provision in the license that required the expansion of services within a given amount of time. As we will see with the case of Deutsche Telekom in Hungary, the awarding of licenses were not necessarily to the highest bidder.

In this Chapter we have discussed a number of factors that are influencing the internationalization process of telecommunication companies in general. As regulatory reforms are creating new market opportunities, telecommunication companies are seeking out those opportunities. Deutsche Telekom is a good example of a carrier seeking out international opportunities. In our "Telecom" model of internationalization, the environmental factors noted in this chapter have influenced and shaped Deutsche Telekom's internationalization strategy. In the next few chapters we will look at the German carrier Deutsche Telekom and show how its efforts to internationalize follow this "Telecom" model quite closely.

Chapter 3

THE CASE OF DEUTSCHE TELEKOM

Introduction

Germany is in the heart of Europe and is one of the strongest countries economically in the world. Germany's telecommunications has been served by Deutsche Bundespost, now called Deutsche Telekom, a traditional PTT (Post, Telegraph, and Telephone) monopoly, as well as its predecessor, the Reichspost. Dating from 1871 when the German Empire (Deutsches Reich) was founded, the Reichspost united the postal services of the individual German states into a single public administration which included telegraph and later telephone services. After World War II, Deutsche Bundespost carried on this administrative monopoly through the years of the "economic miracle" (Wirtschaftswunder), i.e. West Germany's rebuilding of its industrial base and the resulting economic boom.

As a typical post, telegraph and telephone (PTT) company, the Deutsche Bundespost enjoyed a monopoly over all means of communication, including post, telecommunications and the cable television system. It even had a banking service. Its focus was the domestic market. The Grundgesetz, or the constitution, even outlined the duties of this institution, i.e. domestic telecommunication services or services originating in or ending in Germany, and forbid the company from engaging in business outside its home market.

As we learned in the last chapter, global regulatory reform and liberalization were changing the landscape for the telecommunications industry worldwide. Deutsche Telekom's revenues placed it first in Europe and typically third among the top

telecommunication companies in the world behind AT&T and NTT of Japan. Yet in this climate of reform and a European Union deadline for full competition by January 1, 1998, Deutsche Telekom could not risk becoming isolated and stagnant at home. Deutsche Telekom's strategy for the future was to reform itself and to become a player in the international arena.

Within this context, Deutsche Telekom began a process of reform and transformation. The process of reform was accelerated, in part, after unification with East Germany in 1990, with the demands of rebuilding the East's antiquated telecommunications system. It turns out that the knowledge acquired in transforming East Germany was the calling card that Deutsche Telekom could use as it sought to internationalize its business in Central and Eastern Europe.

In the following sections, we will look closely at Deutsche Telekom's predecessor, Deutsche Bundespost and the establishment of Deutsche Telekom as a separate entity, the ramifications of regulatory reform on its structure and business focus as well as highlight Deutsche Telekom's "Telekom 2000" project to rebuild former East Germany.

Deutsche Bundespost

Deutsche Telekom's predecessor, Deutsche Bundespost (DBP), as a prototype PTT monopoly offered high engineering quality, slow response to user needs, and high tariffs (Bauer, 1994). After World War II, the Postal Administration Law of 1953 established DBP's authority and defined its organizational structure in the post-war Federal Republic of Germany (West Germany) (Witte, 1988). A parallel organization called the Deutsche Post was established in the Soviet-occupied German Democratic Republic (East Germany).

DBP's organization included telecommunication, postal and banking services. It was given monopoly control of the national transmission network, switching systems and telephones ("Poking..., 1987). It was headed by the Federal Minister of Posts and Telecommunications who was a member of the political leadership in the federal government. Given special legal status, DBP was allowed to keep its funds separate from other governmental funds, to act independently, and to borrow money and issue loans on the capital market in its own name (Witte, 1988). It was required, though, to pay approximately ten per cent of its operating income back to the federal government each year. In 1986, total revenues were DM 50 billion (\$27 billion), making it the biggest "services" enterprise in Europe ("Engaged...", 1987). Telecommunication revenues constituted nearly seventy per cent of this total (Witte, 1988).

In the late 1980s, the Bundespost employed approximately 500,000 people, 330,000 in postal and banking services and about 220,000 in telecommunications (Witte, 1988) The majority of these employees were civil servants, a special status in Germany denying them the right to strike but also guaranteeing them a permanent job. This special status was a problem for any reorganization, because civil servants could not be fired.

The Problems

As with all bureaucracies there are inherent inefficiencies. The Bundespost was no exception. Of the 1986 revenues stated above, only thirty per cent was generated by the postal and bank employees, constituting sixty six per cent of the work force. Any deficits had to be made up by the other sister divisions, usually telecommunications. This drastically limited the telecommunication division's ability to invest appropriately. **Figure 3** details the profit and loss in 1986 ("Poking...", 1987) The overall profit was positive, but there was a huge deficit in mail delivery that had to be made up by the other divisions.

As a monopoly provider, the DBP lacked customer orientation. For example in 1986, the average wait time to install a new telephone was approximately five weeks and to install a telefax was six weeks. In comparison to the United States, wait times averaged under a week ("Poking...", 1987). (see Figure 4) Long distance calls and



Figure 3 - Deutsche Bundespost's Profit and Loss per Division in 1986



Figure 4 - Average Wait Time For Installation, 1986

leased lines were expensive. According to a study at that time, West German high-speed data transmission services were costing more than in other European countries and up to 15 times more than in America. As a result, Bank of America moved its computer center from Frankfurt to London and some Japanese companies in Germany, such as Panasonic, routed their home-bound telex traffic via London ("Poking...", 1987).

Regulatory Reforms

Postal Reform I

After much discussion and to fulfill the directives in the European Union's Green Paper on Telecommunications of 1987, the West German government passed the Deutsche Bundespost Constitution Act of 1989, effectively separating the operational and regulatory functions of Deutsche Bundespost (Griffiths, 1993). The regulatory functions of DBP, including frequency management, standardization, approval of terminal equipment and regulation, became the responsibility of the "Bundesminister für Post und Telekommunikation (BMPT)" (Federal Minister for Posts and Telecommunications) (Griffiths, 1993). He was also given the responsibility of setting long-term goals and approving financial plans. Two other organizations were also given regulatory responsibilities. The "Bundesamt für Post und Telekommunikation (BAPT)" (Federal Office for Posts and Telecommunications) was given the responsibility of issuing licenses for telecommunications installations, controlling the radio frequency spectrum, and to ensure the adoption of standards. The "Bundesamt für Zulassungen der Telekommunikation" (BZT) (Federal Office for Telecommunications Approvals) was given the responsibility to test and approve telecommunications equipment for use on the telecommunications network.

The operational side of Bundespost was split into three independent, state-owned units: Deutsche Bundespost Telekom, Deutsche Bundespost Postbank, and Deutsche Bundespost Postdienst. The Postbank and Postdienst provide banking and regular postal services respectively. Deutsche Bundespost Telekom provides telecommunication services. In addition, Telekom was granted greater entrepreneurial independence to allow it to better operate in an increasingly competitive telecommunications market (Griffiths, 1993). All three organizations reported to the Federal Minister for Posts and Telecommunications.

The reform act also called for liberalization in some markets ("Deutsche Telekom - Organizational...", 1994). Competition was allowed for some private networks (as long as the origin and destination of the traffic was within the same company). Competition was also allowed for services such as slow speed data, satellite services and mobile communications.

The Role of Telekom - What really has changed?

The Constitution Act 1989 called for Deutsche Bundespost Telekom, later renamed Deutsche Telekom to be set up as a separate entity. As an organization, Telekom faced many challenges changing from a bureaucracy to a more competitive and viable business enterprise. While being freed, in principle, from day-to-day political intervention, Telekom still was a "public organization whose owner [was] the federal state, represented by the Minister for Posts and Telecommunications." (Ricke, 1992)

Regarding services, Deutsche Telekom maintained a monopoly on basic services including network infrastructure and voice telephony, which according to Germany's telecommunications law (Fernmeldeanlagengesetz, or FAG) was to remain in Deutsche Telekom's hands ("German Telekoms...", 1991). The German Constitution limited the company's sphere of business activity to telecommunication services within Germany, and to international service that originated or terminated in Germany. Therefore, Deutsche Telekom was not allowed to provide local telephone and other services outside of Germany. On the financial side, Deutsche Telekom was still not independent. Deficits in the postal services continued to be made up by excess revenues in the telecommunications sector. In 1992, Deutsche Telekom paid DM 1.5 billion (\$ 1 billion) to its sister divisions, enough to only cover half of the expected losses in those divisions. In addition to this, Deutsche Telekom was required to pay taxes on its monopoly profits to the central government (Postal Reform..., 1993).

Concrete Steps of Reform

At the end of 1989 and the following years, amendments were added to the telecommunications law (Fernmeldeanlagengesetz, or FAG) which liberalized some sectors of the German telecommunications marketplace (Griffiths, 1993). The first concrete step occurred in December of 1989, when a license was issued by the BMPT to Mannesmann Mobilfunk authorizing the company to set up a mobile telecommunications network (D2) that would compete with Deutsche Telekom's own cellular (C1) and digital networks (D1). At first, Deutsche Telekom tried to compete, but found its existing organizational structure too cumbersome to respond to market pressures. So a subsidiary was established, Deutsche Telecom Mobile (DeTeMobile) that was designed with the customer in mind.

After the fall of Communist government in East Germany, Deutsche Telekom began to plan strategically for the eventual reunification of the two Germanys. In the summer of 1990, Telekom launched a new licensing scheme that allowed for two-way interactive services permitting interconnection with the fixed public data network at both ends of a connection (Griffiths, 1993) This allowed firms for the first time to set up satellite links between East and West Germany and for them to use their own satellite dishes for communication between offices in the East and across the former border ("German Telekom's Regulation...", 1991).

The market for telephone terminal equipment (e.g. customer premise equipment (CPE) was also opened to competition. Up to this time, telephones were leased together with the basic service and, as a rule, were permanently connected to the network

("Report...", 1992). Customers now had the option to purchase licensed terminals from major retail outlets instead of renting them from Deutsche Telekom. This essentially opened up the market for foreign suppliers who could pass the type approval at the BZT. Although this action opened up the market, customers had to pay 65 DM (German mark) (approximately US\$45) for installation of a universal jack. (Monopoly economics at its best!) The BMPT set a goal for January 1, 1996 to have all universal jacks installed.

The liberalization of the telephone terminal market forced Deutsche Telekom to streamline its procurement system and make it more flexible (Report..., 1992). Since Deutsche Telekom does not manufacture its own telephones, it streamlined its competitive bidding process. The "winner", however, is given only a portion of the entire order. The remainder is offered as an option to some of the other firms to supply at the price of the lowest offer. Market share surprisingly did not go initially to low-priced foreign imports. This is due, in part, to the expensive type approval costs (up to DM 100,000 (\$65,000)), which keeps many imports out of the market. The German people's demand for quality was also a factor. They are used to paying higher prices for higher quality.

In February of 1993, a multinational consortium of companies, E-Plus, was awarded a license to operate one of the world's largest digital cellular networks.(Griffiths, 1993). The E-Plus consortium is made up of the German industrial groups Thyssen (28%) and Veba (28%), Bell-South of the U.S. (21%),, Vodafone of the U.K. (16%), and some smaller German and French interests. The E1-System, as it is called, is based on similar technology as the D1 and D2 systems, e.g. GSM - Global System for Mobile Communication, which was becoming a European-wide standard (Blau, 1992, October). Plans called for E1 to cover 88% of Germany by the end of 1995 and to be able to support three million subscribers (Griffiths, 1993). In July 1996, the German government announced that they will be accepting bids for a fourth mobile license to cover Germany (Boston, 1996, July 16). Existing holders of mobile licenses including Deutsche Telekom, Mannesmann and the E-Plus consortium will not be allowed to bid. Whoever wins the license will be required to reach 75% of the population within five years or by the end of the year 2001. A decision is likely by February 4, 1997.

Tariff Restructuring

In October of 1993, the Minister for Post and Telecommunications announced new tariff structures that would be in effect until the year 1998 ("Deutsche Telekom -Organizational...", 1994). The government chose to follow a price-cap formula, which effectively limits the amount by which a telecom operator may raise prices by linking price changes to a measure of inflation, e.g. the retail price index, plus or minus a percentage factor. (Deutsche Telekom's prices will actually be dropped.) Price-cap formulas tend to help encourage efficiency, as it sets a maximum price, but if a company is able to reduce its costs, it is allowed to keep the cost savings as profits. This arrangement allows the company and its shareholders to benefit.

According to the announcement ("Deutsche Telekom - Organizational...", 1994), telephone tariffs would be reduced in three stages. On January 1, 1996, there was a five percent reduction in inland telephone tariffs. At the same time, a Value-Added Tax (VAT) of 13% was placed on telephony charges, but Deutsche Telekom decided this cost would not be passed on to customers. Business customers could claim back the tax, which Deutsche Telekom will effectively pay on their behalf, and receive a real price reduction in 1996 of 18%. On January 1, 1997, there would be another reduction based upon the rate of inflation plus 1%. And on January 1, 1998, there would be another rate reduction based upon the rate of inflation plus 8%. Overall this is likely to mean total price reductions of at least 25 - 27% for business customers and 13 - 15% for residential customers (Deutsche Telekom - Organizational...", 1994).

One could argue that this rate reduction is unusually harsh, considering that German labor laws make it difficult for Deutsche Telekom to significantly reduce its personnel, especially its large number of civil servant employees. Yet with the opening of basic services to competition due by 1998, the government has recognized that it is imperative that Deutsche Telekom reduce its cost base. This crash program could, therefore, be considered a positive incentive for Deutsche Telekom to prepare itself to defend its market share against rapid erosion (Deutsche Telekom - Organizational...", 1994).

Postal Reform II

Throughout the early 1990s, Deutsche Telekom was in the midst of its transformation from a governmental bureaucracy to a more innovative and competitive business enterprise. With its continued responsibility to cross-subsidize the other postal divisions and the immense financial costs of rebuilding the eastern part of the country, Deutsche Telekom found it more and more difficult to accomplish its goals. With the rapid pace of change in the international telecommunications market, there were growing calls for the privatization of Deutsche Telekom to give it the flexibility and resources it needed to continue its reform and rebuilding plans (Reichlin, 1992), as well as to allow it to operate internationally.

As discussed in Chapter 2, the European Commission had issued directives regarding the liberalization of the telecommunications market that the member states were required to implement. The latest directive was a call to open up basic services (voice telephony, etc.) and network infrastructure provision to competition by January 1, 1998. According to Griffiths (1993), basic services made up 90% of Deutsche Telekom's revenues. Any competition in these basic services would mean lower revenues over all. So there was a sense of urgency within the company to move forward with privatization.

Passed in 1994, Postal Reform II, transformed the former Deutsche Bundespost subsidiaries into joint-stock corporations (Aktiengesellschaften) with regulatory control still in the hands of the Federal Minister for Posts and Telecommunications (BMPT) ("Deutsche Telekom - Organizational...", 1994). The effective date for Deutsche Telekom to be corporatized was January 1, 1995. A holding company with the status of an independent state entity was established to represent the interests of the government. Employees with civil-servant status were to continue to have this status and although they would be working in a corporation, their benefits and compensation would still be determined by the government. The act also called for the privatization of Deutsche Telekom through a capital increase with new stock being floated in an international public offering. Partial privatization of 25% would be offered in 1996 and another 24% in 1998 ("Privatization...", 1993). Since Deutsche Telekom is ranked among the top three telecommunications companies in the world with NTT and AT&T, they could probably raise as much as \$28 billion. The law also effectively freed the company from its domestic provision limitation, although in practice, as we will see in the next chapter, it already was active internationally.

Telecommunications Law of 1996

In July of 1996, the German legislature passed a telecommunications law which effectively ends Deutsche Telekom's monopoly on services as of January 1, 1998 and opens the German telecommunications market to competition ("Telecommunications...", 1996). Provisions of the new law also define how the telecommunications industry will be regulated once competition is allowed. Beginning immediately, private companies will also be able to offer some services, such as data transmission.

Under the new law, any operator may apply for a license to offer services or manage a network in Germany after January 1, 1998, although Deutsche Telekom is to

retain a monopoly on voice services to individual customers until July 1, 1998 ("German parliament...", 1996). This was designed to meet an EU directive timetable for lifting restrictions on alternative infrastructure provision by July 1, 1996. The law stipulates that basic service must be made available to all users, especially in rural areas, at a reasonable cost, though the companies would only be forced to do so if universal service were not provided as a result of market forces (Boston, 1996). This is intended to safeguard against companies concentrating only on the more lucrative urban or densely-populated areas. Deutsche Telekom and its competitors will be required to implement technology to allow customers to keep their existing telephone numbers when they switch service providers ("German committee...", 1996). In addition, these companies are required to provide subscriber information, free of charge, to government security authorities (German upper..., 1996). On the local level, the law requires that rights of way through local communities be granted free of charge to telecom operators to lay their cable (Boston, 1996).

The law also establishes the regulatory framework that will manage the new competitive environment as well. On January 1, 1998, the Ministry of Post and Telecommunications will be dissolved and an independent regulatory body will be established. This new body will be headed by a president and two deputies and will report to the federal economics ministry. An advisory committee made up of 18 members of the Bundestag and the Bundesrat, the upper and lower houses of parliament, will nominate candidates for the positions, but the federal government will make the final appointments. The 16 federal states had fought for more control over telecoms regulatory policy, but the final version of the law effectively keeps it at the national level. The states were, however, given authority to regulate the broadcast spectrum. Not specifically spelled out in the legislation, is how much prices will fall once there is competition. This and other issues will be left to the discretion of the regulatory authority. Of particular

concern is the potential for competitors, particularly electric utilities, to be in a position to cross-subsidize, taking monopoly profits from the electric side and putting it into the telecom side ("Expectations mixed...", 1996).

The passage of the law effectively allows Deutsche Telekom to go forward with privatization in November of 1996. It was important that the regulatory and competitive environment be clearly spelled out to potential investors. If the legislation had not been passed, the public offering would have been in danger.

Telekom 2000 - The East is Rebuilt

When the two Germanys were reunited in October 1990, the various units of Deutsche Bundespost (telecom, post, and bank) in the West absorbed the parallel organizations of East Germany's Deutsche Post. As we discussed in the last chapter, the Communist governments of Central and Eastern Europe greatly underinvested in their infrastructures. Although East Germany was recognized as having the most sophisticated telecommunications system in Eastern Europe (Thimm, 1992), compared to Western standards, Deutsche Telekom took over a very antiquated system. According Gronert (1990), 70% of the central office switches were obsolete.

In 1989, the population of East Germany was 16.4 million people (compared with West Germany's 62.7 million) (The Europa World Year Book, 1992). The total number of telephone connections installed in the East was 1.8 million (compared to West Germany's 28.8 million) (Griffiths, 1993). This gave a telephone density of approximately 11 main lines per 100 people (compared with West Germany's 46). Dialing internationally was also difficult, especially to West Germany. In November of 1989, there were only 111 access lines from East to West Germany (Purton, 1991). Attempting to call to West Germany would normally result in getting a busy signal. The number of access lines available to call other countries was also limited and sometimes took hours to go through (Protzman, 1992, March). With the state of East Germany's telecommunications infrastructure in such poor condition, Deutsche Telekom set about developing a program to rebuild. This program became known as Telekom 2000 (Griffiths, 1993). The plans called for a DM 60 billion (\$35 billion) investment from 1991 through 1997 in infrastructure modernization and mobile communications network expansion. Through the implementation of digital technology, Germany, by the end of the decade, planned to have one of the most sophisticated telecommunications networks in the world (Protzman, 1992, March).

The short-term plans for infrastructure modernization called for immediate construction of new East-West telephone lines to facilitate West German firms setting up businesses in the East, immediate improvement of the technical performance of the telecommunications system, and improvement in the provision of telephone service for new customers in eastern Germany, with a reduction of the long waiting period for new telephones (Thimm, 1992). Long-term objectives included the installation of 7.2 million new telephone access lines (of which, about 1.2 million will be fiber-optic) (Ramirez, 1992), 360,000 fax access lines, 50,000 data connections, and around 70,000 public telephones (Griffiths, 1993). To achieve these long-term objectives, 10 million miles of fiber-optic and copper cables as well as 2,000 digital telephone switches had to be installed (Protzman, 1992, March). One of the initial projects was to install a digital overlay network to facilitate long distance traffic.

Mobile communications networks were to be expanded quickly to offset some of the demand, especially for business customers. The long-term objective was to cover more than 300,000 users. In order to meet these objectives, the German government planned to open the market up to competition (Mannesmann Mobilfunk and El Network) and to allow VSAT-based services and local Public Access Mobile Radio networks to be implemented.

Regarding the infrastructure modernization, work has progressed steadily in the installation of telephone access lines. In 1990 and 1991, around 100,000 and 500,000 lines were installed respectively (Griffiths, 1993). On July 6, 1991, a milestone in the modernization effort was reached when eastern Germany inaugurated a long-distance network of 34,000 lines linking East and West (Protzman, 1992, March) In 1991, 12,000 new telephone booths were installed, but due to vandalism, 7000 had to be replaced ("Telekom reports...", 1992). In 1992 and 1993, around 758,000 and 850,000 new telephone main lines were installed respectively ("East's telephone...", 1993). As of the middle of 1993, the total number of main lines stood at 3.5 million, which translates into a telephone density of 21 lines per 100 people, a marked improvement from its 1989 density of 11 ("Germany -Telecommunications...", 1994).

In order to accelerate local service infrastructure improvements, Deutsche Telekom awarded contracts for an additional 200,000 lines on a turn-key basis. In 1993, Telekom established the conditions for ISDN (Integrated Services Digital Network) connections and the extension of its Integrated Data Transmission Network (IDN) to cover the same amount of area as in the West (e.g. 31,000 data connections) (East's telephones...", 1993).

Regarding the mobile communications network expansion, by the end of 1992, Telekom's analog C network was available in all of the eastern regions. By the end of 1993, Telekom's digital D1 and Mannesmann's D2 system covered 40 percent of the area of eastern Germany and could reach 60 percent of its population. In February 1993, the Düsseldorf E-Plus consortium, promising very compact, inexpensive hand-held telephones and favorable calling fees, was offered a license to establish Germany's first digital cellular personal communications network, E1, in greater Berlin and Leipzig. They expected to expand the network region-wide by the end of 1994.

As of the middle of 1996, Deutsche Telekom reported that there are now approximately 7 million telephone lines installed, 200,000 of which are ISDN (digital connections). This brings the telephone density up to about 40 telephones per 100 people up from the 11 per 100 people in 1990. Almost 90 percent of all local networks have been digitized - almost twice as many as in western Germany. The data network is reported to be complete as well. Mobile communications including analog and digital services as well as radio paging and trunked mobile radio service are available almost everywhere. At the beginning of 1995, the total number of outstanding orders for service stood at 1.6 million. At the end of the year it stood at 900,000. The company expects to be able to fulfill the remaining outstanding orders by the end of 1997 as planned.

Positive Impacts of the Reform Process

The reform process outlined above has impacted both Deutsche Telekom and German consumers. Typical PTT monopolies suffer from weak performance and do not meet the expectations and needs of their increasingly diverse customer base (Bauer, 1995). Deutsche Telekom was no exception. As the reform process unfolds, Deutsche Telekom has had to change its orientation from a government bureaucracy to a more commercial model. When Mannesmann was awarded the D2 mobile license, Deutsche Telekom found organizationally that it could not effectively maneuver and compete on equal footing, so it established a subsidiary, Deutsche Telekom Mobile (DeTeMobile) to manage its mobile services. This smaller organization was designed to be able to adjust to changing customer demands more quickly.

As a response to outside criticism that the company lacked market and customer orientation, Deutsche Telekom sought to reorganize internally to be in a better position to respond. According to Elixmann and Schnöring (1994), three main divisions were established in 1993 to focus on customers: a private customer division, a business

customer division and a division for system customers. All three divisions were supported by the network division.

After the merger with Deutsche Post in 1990, Deutsche Telekom had a combined total of 240,000 employees (200,000 in the West and 40,000 in the East). Its combined revenues that year was approximately DM 37 billion (US\$ 25 billion) and net pre-tax profit was DM 7.5 billion (US\$ 5 billion). In 1994, the company had revenues of DM 63 billion (US\$ 42 billion) and net pre-tax profit of DM 8.5 billion (US\$ 5.7 billion). Results for 1995 show that Deutsche Telekom's revenues grew by 3.6% from the previous year to DM 66.1 billion (US\$ 44 billion) with pre-tax net profits of DM 9 billion (US\$ 6 billion) ("Deutsche Telekom on course...", 1996). This translates into a return on sales of 13.6%. After payment of taxes of around DM 700 million (US\$ 467 million) and the final levy to the government of DM 3.1 billion the consolidated net income was around DM 5.3 billion (US\$ 2.07 billion), making Deutsche Telekom the leading German company in terms of performance for 1995 ("Deutsche Telekom posts...", 1996). This performance was in light of losing market share by 2% from the previous year down to 87%. Mobile communication revenues rose by 12.6% to DM 3.1 billion (US\$ 2.07 billion).

The company was able to significantly reduce its debt from DM 125 billion (US\$ 83.3 billion) in 1994 down to DM 110 billion (US\$ 73.3 billion) in 1995 ("Deutsche Telekom on course...", 1996). The restructuring program and the reduction of the work force led to a 9% rise in productivity per capita from DM 279,000 (US\$ 186,000) in 1994 to DM 300,000 (US\$ 200,000). Redundancies progressed according to plan with 16,000 employees taking early retirement or compensation payments. At the end of the year, the total number of employees stood at 213,000, a 11.25% decrease from 1990 levels.

Digitalization of local networks throughout the country increased from 30% in 1994 to more than 60% in 1995 ("Deutsche Telekom on course...", 1996). Digitalization

in eastern Germany reached 90%. The total number of ISDN channels sold by Deutsche Telekom currently stands at 3.6 million, which makes it the largest network in the world.

The financial impacts of reform reveals one of the key factors in the internationalization process, revenue development and cash flow. Revenue development has been enhanced through the company's restructuring, which has resulted in a greater cash flow needed to invest in international projects. As can be seen by the financial results shown, cash flow dramatically increased between 1990 and 1995. As it turns out, Deutsch Telekom began its international expansion beginning in late 1992 and early 1993, coinciding with internal reform efforts.

Deutsche Telekom's Foreign Direct Investment

In looking at the internationalization of Deutsche Telekom, foreign direct investment (FDI) has played a prominent role. As was discussed in Chapter 1, Dunning's (1981) Eclectic Theory postulates that there are three factors or advantages which allow a firm to invest abroad: firm-specific, internalization-specific, and location-specific factors. Ruhle (1995) has further defined the firm-specific and location-specific driving forces which are influencing the internationalization process. Given the proper set of assets, internal strengths, and market potential, a company can be poised to invest successfully abroad. In the next few sections, we will discuss some of these factors.

Deutsche Telekom's Firm-Specific Advantages

As noted in a previous section, Deutsche Telekom is among the top telecommunication companies in the world. Its 1995 revenues of DM 66.1 billion (US\$ 44 billion) puts the company at the number one position in Europe and second overall in the world. With this kind of revenue, the company has been in a good position to make investments. As Ruhle (1995) points out, revenue development, e.g. the dynamic development and performance improvements of services in the home market, and cash flow are two factors which contribute to internationalization. Ruhle (1995) also points out the location of target markets as a firm-specific factor. Germany's proximity to Central and Eastern Europe has given Deutsche Telekom the advantage in pursuing investment opportunities there. Its experience rebuilding East Germany, in terms of technical as well as managerial knowledge, has also proven to be beneficial. In addition, as a non-manufacturer, Deutsche Telekom has the advantage of being able to pick from the best as well as demand the best solution for a particular problem.

Deutsche Telekom's Internalization-Specific Advantages

As a large corporation, Deutsche Telekom has kept a great deal of its technical as well as its managerial expertise in-house. This knowledge, according to Ruhle (1995), is also difficult to teach to others. With the resources it has on hand, it can create business units internally or seek foreign investment opportunities, to expand its business. This advantage has given the company leverage in negotiating most of its joint-venture and collaborative activities.

Location-Specific Advantages

In the next chapter, we will look closely at the international projects that Deutsche Telekom is involved with to date. As Ruhle (1995) concludes, the location-specific advantages that influence the internationalization process include competition (or planned competition) in the home market, open and transparent regulatory processes in the target countries, GDP per capita abroad, the length of the waiting list for service, and the direction of international telephony traffic. The liberalization of the German market has been a strong motivating force for Deutsche Telekom to internationalize. As investment opportunities have arisen in Central and Eastern Europe, the length of the waiting list for service has been a strong motivational factor as well. In general, the market potential for the countries where Deutsche Telekom invested showed positive growth potential and a relatively stable political climate once political reforms were in place. The tender process revealed a relatively open and transparent regulatory environment. Regarding GDP per capita, of course, the countries of the Eastern Europe had a lower GDP per capita than Germany, but most of the people were highly educated and investment in the manufacturing and other sectors were being made, so one could conclude that there is good potential for the future.

The direction of international telephony traffic has also been a factor. Located in Central Europe, Germany wanted to become an international telecommunications hub between Western and Eastern Europe as well as into the NIS countries.. It, therefore, has pursued a number of international fiber optic cable projects to bring this idea to fruition.

Deutsche Telekom's Internationalization Strategy

Reviewing our "Telecom" internationalization model (Chapter 1), the internationalization strategies identified include foreign direct investment and forming strategic alliances as the main strategies implemented. Beginning in 1992, Deutsche Telekom began a bold and aggressive push internationally. It set up international sales offices initially in New York, Tokyo, London, Paris, Brussels, Moscow, San Francisco, Chicago, Atlanta and later in Singapore, Hong Kong and Beijing. It's internationalization strategy has primarily focused on foreign direct investment in equity joint ventures. It also sought cooperation on standardization and interconnectivity as well as forged strategic alliances with other telecommunication companies in order to broaden its base and to be able to offer global services. By the year 2000 the company expects to generate a significant portion of its revenue from abroad ("Deutsche Telekom on...", 1996). In Chapter 4 we look closely at Deutsche Telekom's internationalization efforts.

Chapter 4

DEUTSCHE TELEKOM'S INTERNATIONAL JOINT VENTURES AND STRATEGIC ALLIANCES

As was mentioned before, Deutsche Telekom's internationalization strategy has primarily involved foreign direct investment in the form of equity joint ventures and strategic alliances. (see **Table 5** and **Figure 5**) This activity fits closely with our "Telecom" model of internationalization. Much of the company's investment has been focused in Central and Eastern Europe as well as in the former Soviet states. The company has also pursued a number of strategic alliances within Europe and internationally. France Telecom, its nearest potential foe, is a partner in a number of these projects. The Global One joint venture with U.S. Sprint and France Telecom has broadened Deutsche Telekom's international activities to the global level.

Since 1992, Deutsche Telekom has boldly and aggressively sought international investment opportunities. Of a total of 22 projects studied, 18 (82%) were equity investments or equity joint ventures, 4 (18%) were non-equity cooperative agreements and 4 (18%) would be considered strategic alliances. Regarding location, 15 (68%) of the projects focused on Central or Eastern Europe (including Russia or the former Soviet states), 1 project (4.5%) was in Indonesia, one in Austria, and one in Singapore. Three projects had a broader focus on Europe, two projects a broader focus on Eastern and Central Europe and the NIS countries and one project had a global focus. In the next few sections we will discuss these joint ventures and strategic alliances in more detail. The examples are listed more geographically than sequentially. More information for each individual joint venture or strategic alliance can be found in **Appendix A**.

| Country or Region | Project | DT's Partners | Nature | Initial Investment | Announce Date |
|----------------------|---|---|--------|---|------------------|
| Austria | O-Call [mobile, GSM] | Siemens Austria | EJV | \$400 million | 1/96 |
| Czech Republic | (not avail.) [mobile, GSM] | STET (Italy) Ceske Radiokomunikace | EJV | \$200 million | 3/96 |
| Hungary | MATAV [national carrier] | Ameritech EBRD MATAV | EJV | \$875 million | 12/93 |
| Poland | Polska Telefonia Cyfrowa (PTC) [mobile, GSM] | U.S. West Elektrim Other Polish firms | EJV | \$338 million | 2/96 |
| Ukraine | UTEL [national carrier] | PTT Telecom (Neth.) AT&T Other Ukrainian companies | EJV | N.A. | 5/92 |
| | Ukrainian Mobile Communications [mobile, analog] | PTT Telecom (Neth.) Telecom Denmark 17 Regional telephone comp. | EJV | N.A. | 5/92 |
| Belarus | satellite, long distance system | Telecommunications Min. Philipps | EJV | N.A. | 11/92 |
| Russia | Mobile Telesystems (MTS) [mobile, GSM] | Moscow City Telephone Service (MCTS) Siemens 17 regional telephone comp. | EJV | \$28 million | 10/93 |
| | Roscom (50x50) Project [fiber optic network] | France Telecom U.S. West Rostelecom | EJV | up to \$600 million by West. partners | 2/94 |
| | Mobile Telephone System [mobile, GSM] | Telecom Finland Others | EJV | \$100 million | 2/94 |
| | RTK [mobile, GSM] | RTK | Ы | N.A. | 4/96 |
| Kazakhstan | Dekatel [switching system, satellite] | Kazakhstan Ministry of Post & Telecommunications | EJV | \$15 million | 10/93 |
| | Kaztelekom [national carrier] | France Telecom Kazakhstan Government | EJV | N.A. | 3/96 |
| Indonesia | Satelindo [satellite, mobile, GSM, international] | PT Telecom Indosat Bima Graha Telecomindo | EJV | \$586 million | 2/94 |
| Singapore | Singapore Telecom | Singapore Telecom | NECA | - | 7/94 |

Table 5 - The Internationalization of Deutsche Telekom

EI = Equity Investment; EJV = Equity Joint Venture; NECA= Non-equity Cooperative Agreement; N.A. = Not Available.

Table 5 (cont'd)

| Country or Region | Project | DT's Partne rs | Nature | Initial Investment | Announce Date |
|---|---|---|--------|-----------------------|------------------|
| Eastern Europe, CIS countries | Romantis [satellite project] | Deutsche Aerospace ANT Nachrichtentechnik Other potential partners in individual countries | EJV | N.A. | 12/92 |
| Europe | Eunetcom [business services] | France Telecom | EJV | N.A. | 9/93 |
| Europe | Global European Network [broadband network coordination] | France Telecom Belgacom (Belgium) Telefonica Espana (Spain) Mercury Communications (UK) | NECA | - | 12/93 |
| Central and Eastern Europe | Trans Europe Line [fiber optic network] | Consortia of 14 companies in Central and Eastern Europe | NECA | - | 1993 |
| Southern CIS countries, China, Japan & Korea | Trans Asia Europe Line [fiber optic network] | Ministry for Post and Telecommunications (China) Other country partners | NECA | - | 6/94 |
| Europe | Atlas [business services, coordinate international activity within Europe] | France Telecom | EJV | N.A. | 12/93 |
| Worldwide | Global One | France Telecom U.S. Sprint | EJV | \$3.5 billion | 6/94 |

EI = Equity Investment; EJV = Equity Joint Venture; NECA= Non-equity Cooperative Agreement; N.A. = Not Available.



Figure 5 - Deutsche Telekom's Internationalization Over Time

Eastern European and Central Asian Joint Ventures

In January of 1996, Deutsche Telekom's and Siemens' joint venture "O-Call" was awarded a license to build a second digital mobile telephone network based upon the Globale Special Mobile (GSM) standard. The winning bid was \$400 million. The partners in this equity joint venture planned to begin building the network in July 1996, to cover 50% of the country by the end of 1997 and 80% of the country by the end of 1998. Additional investment was set at \$600 million.

Czech Republic

In 1995, the Czech Republic sought bidders for a stake in its monopoly carrier. Deutsche Telekom sought after this but was not among the winning consortium. In 1996, the Czech Republic offered a second GSM mobile telephone license up for bid. Deutsche Telekom, STET of Italy and some Czech companies had the winning bid with \$200 million. The partners formed an equity joint venture called TMOBIL to make the formal bid. TMOBIL was awarded 49% of the new company. Ceske Radiokomunikace the Czech transmission company was the other party with 51%.

Hungary

In December of 1993, MagyarCom, a joint venture between Deutsche Telekom and its American partner, Ameritech, was awarded a 30.2% stake in MATÁV, the Hungarian telecommunications provider. Deutsche Telekom and Ameritech's bid of US \$875 million was, interestingly enough, not the highest bid. Deutsche Telekom's experience in rebuilding East Germany was credited as being an important factor. The deal worked out gives the consortium 50% of the seats on the operating committee including the crucial tie-breaking vote, the choice of Chief Financial Officer and Chief Technical Officer, and a 25-year stake in the company (Striplin, p. 363). The partners are expected to invest up to US \$4 billion for infrastructure development. In December of 1995, the partners were allowed to increase their stake to 67% for \$852 million.

Poland

Early in 1996, Poland announced the winning bids for two GSM digital mobile telephone network licenses. A consortium of Deutsche Telekom, U.S. West and a number of Polish firms won one of the bids for a total of \$338 million (\$130 million the first year and the rest to be paid in equal increments for another four years.) This equity joint venture called Polska Telefonia Cyfrowa (PTC) plans to begin service by the end of 1996. Projected subscribers by the year 2000 is about 500,000.

Ukraine

UTEL

In March of 1993, the supervisory board of Deutsche Telekom approved a plan that would give DT a 19.5% stake in Ukrainian Telecommunications (Handelsblatt, March 15, 1993, p. 21). This equity joint venture, called UTEL, was to improve the telecommunications system in the Ukraine. Other partners included AT&T with a 19.5% stake, PTT Telecom Netherlands with a 10% stake and the remaining shares being held by the Ukrainian network carrier Ukrtek and 27 Ukrainian carrier companies. The project called for the partners to install and operate telephone exchange systems for international and national communications as well as build a digital overlay network that would serve 25,000 subscribers. The total capacity of the telephone system is expected to be doubled from 8 to 22 million lines by the year 2008.

UKRAINIAN MOBILE COMMUNICATIONS

Early in May of 1992 a joint venture was announced called Ukrainian Mobile Communications that would team Deutsche Telekom, PTT Telecom Netherlands, Telecom Danmark and 17 regional telephone companies in the Ukraine together to build an analog mobile telephone network. The partners of this equity joint venture planned to initially serve the cities of Kyiv, Sevastopol, Simferopol, Yalta, and Odessa. Within 7 years the system was to have expanded to reach 21 cities. The total investment was expected to be \$150 million.

Belarus

In November of 1992, Deutsche Telekom announced plans to establish an equity joint venture with the telecommunications ministry of the former Soviet republic of Belerus, working with Dutch manufacturer Philips. The venture planned to build and operate the telecommunications network and provide access to international and long distance links. Deutsche Telekom was to have a 51 percent stake in the project.

Russia

MOBILE TELESYSTEMS (MTS)

There are a number of Russian telecommunications projects that Deutsche Telekom has invested in to date. The first is a joint venture, Mobile Telesystems (MTS), that was announced in 1993 with Siemens, the German telecommunication equipment manufacturer, MGTS, a company in Moscow, and other smaller Russian firms to build a digital mobile communications system in the Moscow suburban area. The joint venture, called Mobile Telesystems, has built a network based on the GSM standard, which became operational in 1994. The company expects to be able to handle up to 100,000 subscribers within a 4 - 5 year period. Access to the international telecom network has also been implemented. Initial investment in the venture was around \$85 million. ROSCOM (50x50 Project)

One of the most ambitious Russian projects, to date, is the joint-venture called "Roscom" or (formerly called "50X50 Project") proposed in 1994. In partnership with U.S. West, France Telecom, and the Russian company Rostelecom, Deutsche Telekom proposes to help build a 50,000 km fiber optic overlay network that will connect 50 Russian cities. Initial investment by the foreign partners was to be \$600 million. The total cost could be around \$40 billion over 10 years. Installation was to begin the middle of 1995. As of April 1996, the project has stalled due to uncertainties in financing and terms.

MOBILE SYSTEM LICENSES

In 1994, Deutsche Telekom was one of 3 western companies (with U.S. West and Telecom Finland) that were granted mobile cellular licenses in 4 other Russian cities. These licenses were for smaller cities. Deutsche Telekom and Telecom Finland joined forces in an equity joint venture to use these licenses.

RTK

In April 1996, Deutsche Telekom acquired 48.5% of RTK, which owns six mobile telephone licenses in western Russia. This equity investment will allow the company to expand the systems in the six cities. Expected subscribers will be around 250,000 by 2001.

Kazakhstan

DEKATEL

In this southern former Soviet republic, Deutsche Telekom is forging ties with the Kazakhstan Ministry for Post & Telecommunications. A joint venture, called Dekatel based in Alma Ata, was established in 1993. This joint venture will work on various projects to improve the telecommunications infrastructure. The first project announced called for the installation of an international switch, a terrestrial satellite station, and the construction of a 120 km fiber optic transmission link. The initial investment totaled DM 15 million (\$10 million).

KAZTELECOM

In March 1996, the Kazakhstan government announced that it was planning to sell a portion of its telecommunications carrier, Kaztelekom. Deutsche Telekom and France Telecom have been offered the stake. The goals of this equity investment is to improve
the country's long distance, international telephone network as well as improve local facilities.

Indonesia

Part of Deutsche Telekom's international strategy is to forge links to Asia. In February of 1994, Deutsche Telekom secured a 25% share of the company Satelit Palapa Indonesia (Satelindo). Its \$586 million investment gives Deutsche Telekom a foothold in that part of the world. Satelindo operates the Indonesian satellite Palapa C, launched in 1995, manages access to the GSM mobile telephone network launched in 1994, and handles international connections with the network.

Singapore

In a spirit of cooperation Deutsche Telekom signed a non-equity cooperative agreement with Singapore Telecom in July of 1994. This agreement calls for the development of telecommunication facilities between the countries, the enhancement of existing joint services and the introduction of new ones, as well as for cooperation in integrated services digital network (ISDN) and broadband services.

International Joint Ventures and Cooperative Agreements

Romantis

At the end of 1992, Deutsche Telekom sought partners in a joint venture that would utilize its capacity on Intelsat to offer satellite services in the former Soviet republics. Deutsche Aerospace, a division of Daimler Benz, and ANT Nachrichtentechnik, a telecommunications equipment manufacturer, joined with Deutsche Telekom in the venture. This equity joint venture sought to improve the international satellite access for voice, data and broadcasting in CIS countries. It targets telecommunications operators and large businesses. The area covered stretches from Germany on the west to Japan on the east. In the short term, the Romantis partners will utilize Intelsat capacity. In the long run, they will seek to launch their own.

Eunetcom

In September 1993 Deutsche Telekom finalized a joint venture with France Telecom that targeted business customers. This equity joint venture was the first step in the development of a strategic alliance between these two telecom giants. The partners sought to unify their efforts to offer global telecommunication network services. This project ultimately will be superseded by the Global One alliance.

Global European Network

December of 1993, Deutsche Telekom sought partners for a cooperative agreement, that would unify the standards and setup of broadband network applications across Europe. The partners include France Telecom, Belgacom (Belgium), Telefonica Espana (Spain), and Mercury Communications (UK).

Trans Europe Line (TEL)

As Eastern and Central Europe opened and efforts to upgrade the antiquated infrastructure began, Deutsche Telekom took the lead to seek cooperation in building a fiber optic link between the major cities. The Trans Europe Line (TEL) is the result of this lobbying effort. The agreement calls for each country to pay for its own segment. The first 3,700 km section of the line was completed in 1994 and connected Frankfurt with Warsaw, Prague, Bratislava and Budapest. Plans are in place to extend this to Belarus, Ukraine, Rumania, Bulgaria, and possibly to Russia and on to Finland. Deutsche Telekom is heading up the project and offering technical assistance.

Trans Asia Europe Line (TAE)

In June of 1994, Deutsche Telekom confirmed that the company was planning a fiber optic link from China through Central Asia to Europe called Trans Asia Europe Line (TAE). As a logical continuation of the Trans Europe Line (TEL), the TAE would link the new Central Asian countries of Kazakhstan, Turkmenistan, Kyrgyzstan, Uzbekistan and Tajikistan not only to Europe, but also to China, Japan and Korea. The 24,000 km cable project is being jointly overseen by Deutsche Telekom and the Ministry for Post and Telecommunications in China and is scheduled to go into service in March of 1997.

Atlas

Within the heart of Europe, Deutsche Telekom and France Telecom are two powerhouses in the telecommunications field. France Telecom has yet to report its 1995 earnings, but in 1994 it had \$28 billion which gave it the number four position in the world. Each has enjoyed monopoly status at home and are equally threatened by European liberalization, especially in 1998 when basic services are to be opened to competition. It can be argued that these two neighbors are potential competitors in their home markets. Yet these potential adversaries have joined forces in a number of ventures both in Europe and internationally.

In December 1993, a memorandum of understanding was signed by Deutsche Telekom and France Telecom that called for the establishment of a joint venture, called Atlas (Weinkopf, 1995). The formal agreement was signed in December 1994. The strategic plan of this venture called for combining existing business units of both companies that were focused primarily on business services. This 50/50 joint venture would then pursue business customers first in Europe and then later expand internationally. They planned to offer international end-to-end services, VSAT, data network services, intranational & international voice virtual private networks, customerdefined networks, and outsourcing.

International Strategic Alliances

Global One

As mentioned previously, the strategic plan of Atlas called for expansion internationally. In the middle of 1994, the U.S. long-distance carrier, U.S. Sprint, was approached by Atlas to form an alliance and create an organization offering global services. During this same time period other alliances were being formed by competitors, e.g. Concert (MCI and British Telecom), Worldsource (AT&T and others), Unisource (PTT in Switzerland, PTT in Netherlands, Telia in Sweden, Telefonica Espana in Spain) and Uni-World (a joint venture between AT&T and Unisource). A memorandum of understanding was signed in June 1994 and a final joint venture agreement was signed in June of 1995. See **Table 6** for a complete list of milestones for this joint venture.

The joint venture, Global One (formerly referred to as Phoenix) comprises the international operations of all three companies (Keller, 1996). Deutsche Telekom and France Telecom will each buy 10% of Sprint for an estimated price of \$3.5 billion. All three partners would remain 100% responsible for the business services in each of their respective countries. Business in Europe (other than in Germany and France) would be divided up between Atlas (2/3) and Sprint (1/3). The rest of the world as well as the global network backbone would be divided 50/50 between Atlas and Sprint.

As the joint venture name implies, the Global One partners plan to offer global services to both business and individual customers. Expansion will include more carrier and consumer services. "Away from home" services such as prepaid calling cards, collect calling and toll-free numbers are planned. (Keller, 1996). According to Chris Rooney, the chief executive officer of Global One, the venture will provide "locallybased global account managers to handle customers' needs as well as 24-hour, 7-days-aweek service agents and state-of-the art technology." (Keller, 1996).

The Global One partners will combine and extend their existing international services including Eunetcom and Sprint International. The data networks of Deutsche Telekom (Datex-P) and France Telecom (Transpac) will be combined into Global One as well. After January 1, 1998, the Datex-P and Transpac units will be combined in each of the countries. Overall Global One will begin with annual revenues of \$800 million, 3,000

64

| Table 6 - (| Global | One | Partnership | Milestones |
|-------------|---------------|-----|-------------|------------|
|-------------|---------------|-----|-------------|------------|

| December 1993 | Atlas Memorandum of Understanding signed by D.T. and F.T. |
|-------------------|--|
| June 1994 | Phoenix (later known as Global One) Memorandum of Understanding signed by D.T., F.T. and Sprint. |
| July 1994 | Notification of Phoenix joint venture made to the Dept. of Justice in the U.S. |
| October 1994 | Notification of Phoenix joint venture made to the Federal Communications Commission in the U.S. |
| December 1994 | Atlas joint-venture agreement signed; European Commission notified. |
| January 1995 | European Commission Approval Procedure begins |
| Spring 1995 | Various requests from E.C. |
| June 1995 | Phoenix joint-venture agreement signed; European Commission notified. |
| July 1995 | Phoenix - Consent Decree with D.of J. approved. |
| January 31, 1996 | Agreement Finalized - Name changed to Global One |
| February 20, 1996 | Swiss subsidiary established to focus on domestic market. |
| February 28, 1996 | Global One with Israeli partners bid for second carrier license in Israel. |
| July 17, 1996 | EU gives final approval to Atlas/Global One with conditions. |

employees, and 1200 switching centers worldwide in more than 50 countries. On January 31, 1996 the partners finalized their agreement.

In February of 1996, the Global One partners began their concerted effort at seeking global business by establishing a subsidiary in Switzerland that will focus on the domestic market. They seek to win 20% of the market by the year 2000. The unit plans to provide customers in 30 cities with telecom phonecards and data transmission services this year. When the Swiss market is fully liberalized in 1998, the unit expects to provide full services. The Global One partners also went after the second carrier license in Israel during the same time period. Joining with Israel's Clalcom Ltd., a value-added service provider, and Matav, an Israeli cable television broadcast service provider, the partners bid for a place in the \$600 million Israeli telecommunications market.

In July 1996, the Global One partners received the final regulatory approval for their venture from the European Union ("Global One finally...", 1996). The approval was granted with a number of conditions. Deutsche Telekom and France Telekom are specifically prohibited from cross-subsidizing their joint venture and discriminating against market players. Both countries had to commit to early liberalization of their infrastructure in 1996. The approval will be valid for 5 years and will be reviewed in 2001 at the same time as the BT-MCI alliance. The Commission also set out a two-tiered approval with authorization of Atlas/Global One European and global services as well as most value-added services in France and Germany from the date on which France and Germany grant the first two alternative telecommunications infrastructure licenses for liberalized services (i.e. basic services can be excluded until 1998) ("Atlas-Global One...", 1996). The second stage of approval (mainly for the Atlas joint venture) may include the national public-switched data networks, Transpac and T-Data. Approval to include these services in the venture will be authorized only when France and Germany fully liberalize all telecommunication services, including basic services and all network infrastructure, which is expected by January 1, 1998. Access to these domestic publicswitched data networks must still be maintained on a non-discriminatory, open and transparent basis to all service providers offering low-level data services (i.e. using protocols such as X.25, Frame Relay, Internet or SNA) and they must also implement any generally applied standard that may modify, replace or co-exist with the current standard. Deutsche Telekom and France Telecom acting as distributors for Global One/Atlas in their respective countries must each negotiate a separate distribution agreement. France Telecom must also sell INFO AG, an important competitor of T-data in the German data network services market.

As we have seen in this section, Deutsche Telekom has aggressively sought international opportunities through foreign direct investment and strategic alliances. The various investment strategies have included purchasing shares in a telecommunications operator, establishing joint ventures, obtaining a license or franchise to offer telecommunication services usually with other partners, and merging or acquiring a telecommunications provider. As we review our "Telecom" model of internationalization, we see that Deutsche Telekom fits this model exactly.

CONCLUSIONS

Within the last decade telecommunication companies have been internationalizing their operations at an unprecedented pace. Stagnant home markets, liberalization and increased competition have prompted many telecommunication companies to seek profits outside of their home market. This research has sought to qualify and to quantify the internationalization process of telecommunication companies. In Chapter 1, the "Telecom" model of internationalization was developed. This model presents a number of firm-specific and environmental factors that are influencing the internationalization process. The outcome of the process was identified as foreign direct investment and/or strategic alliances. In Chapter 2, the environmental factors such as global trends of regulatory reform, technological developments, increased competition and the internationalization process.

In Chapter 3 and 4, Deutsche Telekom, the German national carrier, was chosen to test the model. Deutsche Telekom has pursued an aggressive internationalization strategy that has focused on foreign direct investment and strategic alliances. Through internal restructuring and cost reduction since 1990, the company's revenue development and cash flow improvements have given it the cash to make investments at an unprecedented pace. With management support, the company has pursued opportunities in Eastern and Central Europe as well as into the former Soviet states with striking success. Starting with the Ukraine and continuing on in Hungary, Kazakhstan, Russia, Indonesia, Singapore, the Czech Republic, and Austria, Deutsche Telekom has

68

capitalized on its internal strengths and knowledge and has rapidly internationalized its operations within three years.

On a broader basis, Deutsche Telekom has forged strategic alliances (Eunetcom, Atlas, Global One) with a potential adversary (France Telecom) and courted the third largest long distance carrier in the U.S. (Sprint) to meet its goal of achieving "critical mass" and creating a global infrastructure to meet the demands of its global customers. Since the conclusion of the agreement in February 1996, the Global One partners are already aggressively pursuing opportunities in Switzerland and Israel.

The telecommunications world has dramatically changed. In this climate of global regulatory reform and market liberalization, internationalization among telecommunication companies will continue to grow. With 1998 approaching for full market liberalization in Europe and the recent passage of the Telecommunications Act of 1996 in the U.S., this indeed, is a changing, yet exciting time for telecommunication companies worldwide.

APPENDICES

ADDITIONAL FIGURES



Figure 6 - Austria O-Call Joint Venture





Figure 7 - Czech Republic: Digital Mobile Telephone Joint Venture



Figure 8 - Hungary: MATÁV (Hungarian Telecommunications) Joint Venture



Figure 9 - Poland: Polska Telefonia Cyfrowa (PTC) Joint Venture



Figure 10 - Ukraine: UTEL Joint Venture



Figure 11 - Ukraine: Ukrainian Mobile Communications Joint Venture

76 APPENDIX A



Figure 12 - Belarus: Belarus Telecommunications Joint Venture



Figure 13 - Russia: Mobile Telesystems (MTS) Joint Venture



Figure 14 - Russia: Roscom (50 X 50 Project) Joint Venture



Figure 15 - Russia: GSM Mobile Telephone System Joint Venture



Figure 16 - Russia: RTK Equity Investment

81 APPENDIX A



Figure 17 - Kazakhstan: Dekatel Joint Venture

82 APPENDIX A



Figure 18 - Kazakhstan: Kaztelekom Joint Venture

83 APPENDIX A



Figure 19 - Indonesia: Satelindo Joint Venture

| Deutsche Telekom Telecom | | | |
|---|---|--|--|
| Nature: | Cooperative Agreement (Non-Equity) | | |
| Partners: | Deutsche Telekom Singapore Telecom | | |
| Initial Announcement: | July 1994. | | |
| Initial Investment: | Not Applicable. | | |
| Goals: • Develop te • Enhance en • Explore and (ISDN) and | elecommunication facilities between the two countries. xisting joint services and introduce new ones. eas of cooperation in integrated services digital network ad broadband services. | | |
| Source: various | | | |

Figure 29 - Singapore: Cooperative Agreement



Figure 21 - International: Romantis Joint Venture

86 APPENDIX A



Figure 22 - International: Eunetcom Joint Venture



Figure 23 - International: Global European Network



Figure 25 - International: Trans Asia Europe Line (TAE)



Figure 26 - International: Global One Joint Venture

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