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Telecommunications in Israel: Advanced Technology, Evolving Competition

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5.1 Introduction

5.1.1 Overview

Modern telecommunications infrastructure and services are of extreme importance to Israel's economy and receive special attention by the general public and the government. The past decade was characterized by major changes and improvements in Israeli telecommunications. Ongoing regulatory changes are enhancing competition and leading to added improvements in the quality and variety of telecommunications services.

This chapter presents both a historical overview and an updated description of the regulatory environment and the telecommunications networks and services in Israel. Emphasis is put on regulatory aspects (policy, organization, licensing, type approval, privatization, tariff setting, and regulation), telecommunications networks (infrastructure, international telecommunications, technology, data communications and information technology services, mobile communications, and broadcasting), and economic development (history of economic development and tariff structure). Future trends from technological and policy-making aspects are also discussed.

5.1.2 National Characteristics

The state of Israel was established in 1948 based upon democratic and juridical principles derived from western democracies combined with the traditions of Jewish law and practice. Israel is a parliamentary democracy, consisting of legislative, executive, and judicial branches.

Israel is a small country. Its borders enclose a total area of 7,993 square miles. In comparison, Great Britain has an area of 94,500 sq. miles, and Denmark, 16,611 square miles. Despite its small area, Israel contains almost every type of

geographical terrain—mountains, subtropical valleys, deserts, and fertile farmland. In 1994 the population was 5.4 million (of which 600,000 are immigrants arrived since 1990), totaling 1.4 million households. Prior to the recent wave of immigration from the Soviet Union and Ethiopia, the annual growth rate averaged 1.3–1.9%. Israel is now experiencing a high growth rate. (The gross domestic product increased in 1991, 1992, 1993, and 1994 at an annual rate of 6.2%, 6.6%, 3.5%, and 6.7%, respectively.) This naturally affects all aspects of Israel's economic and social development.

Israel has established a wide range of academic, industrial, and service activities that compare favorably with other larger industrially developed countries. However, due in large part to Israel's socialist history, while 50% of the economy is in private hands, 25% is in the hands of the trade union movement (the Histadrut) and 25% is in the hands of the government. As is seen by the example (discussed later in this chapter) of Bezeq, the Israel Telecommunication Corporation, Israel is moving further in the direction of a market economy.

Israel was, until recently, politically isolated from most of the surrounding Arab nations. It relies on trade with Europe and North America and its growing trade with the Far East. Israel is in the unique position of a "trade bridge" by virtue of free-trade agreements with the United States, the European Community, the European Free Trade Association (EFTA), and the new Palestinian National Authority (Luboshits, Kasirer, 1994). An Israeli-based subsidiary or an Israeli strategic partner of a foreign company with manufacturing operations in Israel benefits from tax and investment incentives, from duty-free status when importing inputs from the United States or Europe to Israel, and from duty-free status when exporting the finished products from Israel to Europe or the United States. Due to the definitions of rules of origin within the agreements and the highly skilled labor available in Israel, industries that can take greatest advantage of this double agreement are those employing high technology or those capital-intensive industries employing high-grade labor.

5.1.3 General View of the Israeli Economy

Recent dramatic political events have propelled the economy on a fast track: The large wave of immigration (about 600,000 immigrants arrived since 1990, 565,000 from the former Soviet Union and 35,000 from Ethiopia) and the signing of the Declaration of Principle between the Government of Israel and the Palestine Liberation Organization (PLO) in September 1993 opened new doors and opportunities for business and economic activity. The wave of immigrants affected the economy in three ways: an enormous impact on construction, a temporary but sizable rise in private and public expenditure, and a downward pressure on wages. The peace process has already yielded significant economic benefits, among them a rise in tourism and a rise in exports, the result of a more positive attitude to Israel, especially in the Far East markets (Baudot-Trajtenberg, 1994), as well as growing investment in Israel, especially by multinational corporations. In 1994 Israel's gross domestic product per capita reached \$13,000.

The government economic policy since 1992 has been to decrease government

involvement and increase private sector initiative, utilizing foreign financing. The government provided massive support to the building sector, in order to provide housing for new immigrants, and through a public construction spurred economic growth, of which investment in infrastructure (such as roads, electrical utility, and telecommunications) was a key element. In parallel, the government initiated a privatization program, with the aim of increasing Israel's competitiveness in foreign markets by removal of business and industrial activities from government control and by further liberalization of the economy. In 1995 the economy was moving in the direction of export-oriented economic growth, mainly owing to the success of Israel's high-tech products in world markets.

In telecommunications, cooperation between the local communications industry and Bezeq has been very important. In 1994, 95% of all Bezeq purchases were Israeli manufactured, making Bezeq a prime tool in supporting industrial development and thereby indirectly improving Israel's competitive capabilities in international telecommunications markets. Telecommunications manufacturing capability ranges from basic telephone handsets to sophisticated public switching systems, transmission systems, radio equipment, data communications, and satellite communications technology.

Sales of electronic products totaled \$5,210 million in 1994, of which 72% were exports. At the end of 1994 there were 38,000 employees in the Israeli electronic industries. Sales per employee reached \$136,420. The added value of this industry reaches 68%; 33.6% of total electronic industry sales (and 30.5% of exports) were civilian telecommunications products (Association of Electronic Industries, 1995).

5.2 History of Telecommunications Development

5.2.1 *Development of Telecommunications: 1948–1984*

The development of the telecommunications sector in Israel is a direct result of major developments in the Israeli economy. In the two decades after the establishment of the state, the population grew by over 3.5 times, and the gross national product, by over 4.2 times. The demand for telephones per capita in the early 1970s was five times higher than it was in 1948, and the size of the network per capita was nine times greater (Hai, 1969).

All telecommunications activities, except the manufacturing of equipment, were under the direct management of the Ministry of Posts, with the resultant bureaucracy concerning operation management, allocation of resources, funding, and labor policy. The Civil Service Commission, the Ministry of Finance budget department, and the Comptroller General had a great influence on this industry. The officials of the Ministry of Posts had limited authority to manage the operations of telecommunications development. One basic result of this, whereby the ministry had limited authority and the operations management had responsibility but no authority while other influential parties had other priorities, was persistent

unbalanced development, manifesting itself in the size of the excess demand and the structure of the network, switching versus transmission channels, and local access. One of the major phenomena of telecommunications network development in Israel was the huge waiting list, which reflected the state of outstanding demand and the structure of the rationed market. In May 1948 the network consisted of almost 11,000 telephone customers with an outstanding demand for 24,500. By March 1969 the network contained 300,000 lines with an outstanding demand for 337,000 telephone lines. During the first two decades, 60% of the demand was located in residential areas, and 40% was generated by the business sector and industry. As a result of the supply shortage in the telephone market, the business sector was formally given priority in the allocation of new installations. Thus, of the additional supply of telephone lines, the portion allotted to households at the end of the 1970s was under 40%. This explains the phenomenon of the waiting list in residential areas (Hai, 1979a). Also, the demand for telephone services was highly concentrated in urban areas, especially in Tel Aviv and the surrounding region, which accounted for almost 75% of total outstanding demand in the first decade. By the end of the second decade the burden was even higher and reached 80% (Hai, 1979b).

In 1948 there were 45 switching centers of which only 19 were fully automated. At the end of the first decade there were about 72 switching centers, of which 57 were fully automated. By 1969 the entire Israeli network was fully automated.

Both the number of switching centers and the average capacity per central office reveal the change in technology. In 1950 the average capacity per central office was 1,000 lines, whereas by the end of 1969 the capacity level reached 10,000 lines. The massive demand and the structure of operations management required the implementation of technological changes. Simultaneously, a whole series of line-sharing devices ("party lines") were introduced, which helped meet demand but impaired the service quality drastically (Hai and Berman, 1973).

Growth in the telecommunications sector during Israel's first two decades was higher than growth in the national economy. Between 1948 and 1951 this industry went through an organizational phase in preparation for growth which was parallel to other industries after the establishment of Israel. The increase in telephone prices suggests that the government was shocked by the sudden increase in demand and used a pricing mechanism policy as a demand barrier. In the years 1952–1954 the country in general was under the effect of a "new economic policy" introduced to fight inflation; the installation rate was decreased in line with government policy of decreasing public expenditure.

The period 1954–1960 was the "preboom" period of the Israeli economy. There were cyclical changes in demand with an effective increase in real prices that telephone users were supposed to meet. The overall trend was increased demand, exceeding the amount of resources that the administration directed to network expansion.

This was followed by the "boom period" (1960–1965), when unemployment reached 2%. The industrial sector began to flourish and the economy progressed toward the industrialization phase. Demand and supply of telephone lines grew

with lags between the ministry's ability to meet supply and the economy's requirements.

The period 1965–1968 was one when Israel, for the first time, faced a decrease in immigration. A large construction project for water resources that provided an ample number of jobs was terminated, and the 1967 war halted the increase in general activity. The telecommunications industry reacted with a lag of two years, and only by 1969 did the industry reveal a slowing trend in demand and in overall activity.

Another boom period, 1968–1970, started after the 1967 war when government funds were directed toward building up the infrastructure within the new borders of Israel. The telecommunications industry was summoned to contribute its share, and statistical analyses show an increase in the outstanding demand for telephone lines (Hai and Raiphan, 1976).

The geopolitical situation of Israel calls for profound and well-built international ties. Thus, Israel has one of the most developed international telecommunications systems in the region. The trend began at the end of the 1960s. Until 1968 most of the international network was based on high-frequency radio links. In 1968 the first submarine cable to Marseilles was laid (with 128 voice channels). This new medium enhanced expectations for increased traffic, and within three years the initial investment was covered.

In 1970 the Ministry of Posts changed its name to Ministry of Communications (MoC), reflecting the changing role of its activities. The new ministry made a concentrated effort in the early 1970s to expand capacity. In 1972 Israel became part of the global International Telecommunications Satellite (INTELSAT) network, having completed its modern satellite earth station. The development in international telecommunications was faster than the performance of MoC in other parts of the network. Capacity was highly redundant, and traffic increased at the rate of 20% to 25% per annum. In the early 1970s television channels were used for international program transmissions, and international data communication circuits were available (Shalom and Razin, 1986).

In the third decade the telecommunications network faced a turning point. The general economic environment required more and more resources from this industry. Revenue transfers from the MoC to the government were increased but were not used to expand the telecommunications network (Hai, 1968). Deterioration in the quality of services became almost the trend at the end of the third decade. Its manifestation was failure to obtain dial tone, bad and noisy communications, and unsuccessful calls during the business hours and in the evenings.

An intense effort was made by two succeeding governments to make the system more efficient. Finally, in August 1982 after prolonged discussion with other bodies of government (especially the Ministry of Finance), the Knesset (Parliament of Israel) approved the Telecommunications Law (Knesset, 1982), laying the foundation for a new organization to operate telecommunications activity to be called Bezeq, the national telecommunications company, and a newly structured ministry, the MoC, to regulate it. This new structure came into effect in 1984. The Postal Authority was likewise formed and began operations in 1987 (Knesset, 1986a).

5.2.2 *Bezeq, the Israel Telecommunications Corporation: 1984–1994*

Bezeq is a government-owned corporation with a board of directors nominated by the government. The management runs the operations independently, guided by the board of directors.

As a monopoly, Bezeq is bound by the regulations of the MoC. The final confirmation of tariffs is given by the finance committee of the Knesset. The designers of this structure intended to separate management from control, leaving management to managers who operate in a quasi-private enterprise environment and leaving control in the hands of government, whose job it is to set rules for the entire telecommunications sector and, in particular, for Bezeq as a “natural monopoly.”

Bezeq was mandated to mobilize, within the first five years, enough resources to clear the market demand for telephone lines and to create a solid infrastructure. Bezeq launched an entire system of operations aimed at meeting these goals. In the first five years, Bezeq generated a 10% rate of annual growth, while national economic growth was 2% to 3%. It introduced the most advanced technologies in switching and transmission and provided a wide range of customer-premises equipment and advanced services over and above the basic services.

Bezeq initially focused on supplying demand for basic telephony services and delivering data communications services, vital for Israel's economy. These goals were achieved by mid-1989. In the beginning of 1984 there were 1 million direct main lines, and the telephone density was 24.9 main lines per 100 inhabitants, while the waiting list was over a quarter of a million, with average waiting time of over three years and some customers waiting up to 10 years for a telephone line. By the end of 1988 there were almost 1.5 million main stations, the telephone density was 32.9 main lines per 100 inhabitants, and the average waiting time for a telephone line was three months. By the end of 1994 the telephone density rose to 39.2 main lines per 100 inhabitants, and the average waiting time for a telephone line was 28 days.

During its first five years, the company added 386,000 telephone lines, about 40% more than in the equivalent period prior to the creation of Bezeq. In the next five years 486,000 telephone lines were added. This represents an increase of 80% in the number of main lines, a significant achievement. Also during this first five-year period the total number of telephone calls increased by 40%, and international traffic, by almost 120%. The growth in the number of paid minutes in the next five years was 66%. Another important achievement was the 70% increase in public phones installed, placing Israel as one of the 10 advanced countries in the world in public phone penetration (Bezeq, 1994), achieving a density of 313 public phones per 100,000 inhabitants in 1988 and a density of 352 public phones per 100,000 inhabitants in 1994. During 1990, Bezeq began the installation of card-operated pay phones, and by the end of 1994, 85% of the pay phones were card operated.

Bezeq also recorded in the first five years a high rate of expansion in the number of leased data lines from 4,400 to 10,500, including 2,000 digital point-to-point lines installed in 1987 alone. This represents an increase of 140% over the previous period. In addition, along with Motorola Israel, Bezeq built a cellular

radio telephone system that served over 6,000 customers at the end of 1988 and about 150,000 customers by the end of 1994. This same period saw an appreciable slowing down in telex services, mainly because of the availability of alternatives, such as facsimile and electronic mail.

At the outset of the five-year period, almost the entire switching and transmission system was analog. Only 3% of the capacity was digital. At the end of 1994, 81% of the central office capacity was digital. The interurban network is rapidly being converted to fiber cables.

Efficient use of resources has been a main theme of the corporation. Over the first five-year period, the number of Bezeq employees increased by 11%. There was a consistent decline in the number of employees per 1,000 lines, from 7.6 to 6.55—one of the lowest in the world (Bezeq, 1994). The number of invested days in development and maintenance rose over 33% during this period. At the end of 1988 Bezeq had 9,120 employees. The efficiency continued to improve, and by the end of 1994 Bezeq had 9,705 employees, 4.63 employees per 1,000 telephone lines.

Improving the quality of service is of major concern to Bezeq. Since 1989, Bezeq shifted its focus from supplying basic demand to improving the quality and variety of services. Bezeq is engaged in a major effort to achieve a high quality of service, covering all the company activities. The main efforts were concentrated on building a market-oriented service culture into Bezeq's organization and personnel. The results of the quality of service improvement program are impressive. During 1994, Bezeq processed and fulfilled 80% of new telephone installations within 10 days. Ninety-four percent of repairs were carried out within the same work day. Average waiting time for operator services is less than 10 seconds. Call completion rate reached 57.5%, and customer fault rate went down to 1.5 per 1,000 direct telephone lines.

The corporation's commercial operation resulted in profits that were mostly absorbed by the government in different forms. Over the first five-year period, profitability decreased from 5% to 1% return on equity, growing again to 7.6% in 1994. In the first five years there was a permanent lag in the adjustment of tariffs, and these were thus deflated by 35%. Transfer payments to the government of royalties and interest on debentures amounted to more than 20% of the corporation's revenue. This was amended to a degree in later years. In 1994 transfers to the government were 5.0% of Bezeq revenue as royalties and 3.5% as taxes (Bezeq, 1994).

5.3 Telecommunications Policy, Privatization, and Reregulation

5.3.1 National Telecommunications Policy

Before 1982, the policy of the MoC was to preserve the monopoly structure of the sector in order to maintain maximum rate of growth and network integrity. The structure and level of tariffs were basically an extension of taxation policy, the target being to generate maximum income from those with the ability to pay (Hai, 1976a). Access charges were relatively high to discourage newcomers from the waiting list and to disperse the heavy burden on the population, which already had

access to telephone services. Usage fees were far above real costs, and the telecommunications industry made reasonable profits, but resources were only partially funneled to increasing its capacity (Hai, 1968), and the rest was transferred to the government treasury.

The crux of the policy was to concentrate on the supply of basic telephone services and international services, required as a result of Israel's geopolitical isolation. The limited resources resulted in achieving quantitative growth at the expense of quality of service. In addition, there were cross subsidies between postal, telecommunication, and broadcasting services, including the actual transfer of funds from telecommunications to the other activities.

After 1982, when the Telecommunications Law provided the legal and regulatory framework for the changes in the MoC (Knesset, 1982) and the creation of Bezeq, and after 1986, when the Postal Law provided the framework for the creation of the Postal Authority (Knesset, 1986a), all parties were involved in building their own infrastructures. The MoC had to learn how to regulate two bodies whose functions it formerly operated, while Bezeq and the Postal Authority had to learn how to operate as commercially viable but regulated enterprises.

The MoC appointed several committees to recommend policy. The recommended policies were slowly implemented. While the establishment of these committees reflected an attempt to address the public and industry concern with regard to telecommunications policy, the rate of implementation can probably be attributed more to political than to any other causes.

In 1995 the customer-premises equipment market (telephones, key systems, and modems) was highly competitive, subject to MoC-type approval. Bezeq still has sole responsibility for commissioning and maintenance of PABX equipment, although the purchasing of the equipment itself is open to competition, and customers usually buy directly from local industry (Tadiran and Telrad). Simple resale of leased lines was prohibited. Value-added services were still licensed by the MoC, although the policy of granting such licenses has been greatly liberalized. Thus, in recent years several organizations have each acquired broad licenses, allowing the provision of value-added services over their own networks, including the ability to offer packet-switched public data services. All other value-added services have been required to base their services on ISRANET, Bezeq's packet-switched public data network. Terms of licenses are also liberal in the use of leased lines between hosts and users or information providers.

5.3.2 Restructuring of the Telecommunications Sector

In May 1991 a committee on restructuring the telecommunications sector (called the Boaz committee after its chairman, then director of the Budgets Department in the Ministry of Finance) recommended that competition should be encouraged in several areas of telecommunications, particularly in customer-premises equipment, value-added services, data communications, mobile telephony and international services (Government of Israel, 1991). Nonetheless, the committee noted that it would still be advantageous to maintain a monopoly in many infrastructure-related areas and in basic telephone services; the infrastructure itself, however,

should be made competitively available to service providers by the monopoly (Bezeq) on a commercially viable basis. Bezeq should also be permitted to enter into competition in the provision of services if it does so through subsidiaries.

The committee differentiated between monopoly services (basic telephone services), services to be provided with limited competition (cellular telephony, international telephone services, and satellite earth stations), and services to be provided under full competition (customer-premises equipment, infrastructure and maintenance, value-added services, and mobile services such as paging and trunking). The committee also noted that resale and sharing of circuits with capacity of up to 2 Mbit/s should be licensed (higher capacity circuits would still be exclusively offered by Bezeq) and that cable television networks should be open to information service providers.

The committee suggested that a liberalization policy should be adopted in telecommunications among members of closed user groups. It also asserted that it is necessary to regulate all activities that are wholly or partially monopolistic whether there exists a single monopoly or a limited number of licensed operators. The committee recommended that regulation should relate to the quality and availability of the service, the tariff rates and structure, and the equality of service provision mechanism. In areas in which there is full competition, the market would be expected to create an environment that is conducive to quality service, and it is incumbent on the government to ascertain that licensing conditions are met, as are compulsory standards.

In order to accomplish these recommendations, the Boaz committee implicitly stated that the 1982 Telecommunications Law should be modified. This was approved by the Knesset in January 1993 as part of the 1993 government budget bill. This change paved the way to competition in both cellular telephony and international telecommunications services.

5.3.3 The New Bezeq General License

On 9 July 1992 the departing minister of communications issued a policy paper and a new general license for Bezeq (Ministry of Communications, 1992a). The policy paper supported the main ideas presented by the Boaz committee and created a new structural regulation policy as a key policy ingredient, assuring true competition in the relatively small Israeli marketplace.

Structural regulation, according to this paper, meant that Bezeq should be controlled by a holding company. Bezeq should be allowed to offer only regulated monopolistic services, and nonmonopolistic services must be offered through only affiliated subsidiaries, in which Bezeq's holding company would control no more than 49%.

Bezeq would not be permitted to offer competitive telecommunications services, including customer-premises equipment, enterprise-premises telecommunications systems, satellite-based international digital leased line service, domestic microwave links service, satellite earth stations, paging, cellular telephony, public telephones, information technology value-added services (including electronic mail, EDI, and data base access and management), packet switching, and telex. Bezeq would continue to provide broadcasting services, until a more detailed

decision on this subject could be reached. The relationship between Bezeq and its customers would be based on standard practice commercial-type contracts.

The manner in which the new general license was issued and the limitation on Bezeq's activities and investments were not well accepted. The activities of interested parties, among them Bezeq management, worker unions, and the industrialist lobby, created strong public pressures, and the newly appointed minister of communications immediately appointed a new committee to examine the telecommunications policy and the Bezeq general license. The committee (called the Maoz committee after its chairman, then adviser to the minister) presented its final report to the minister of telecommunications in September 1992 (Ministry of Communications, 1992b).

The Maoz committee's key recommendations were to support the Boaz committee recommendations and subsequent policy paper and general license and to widen the list of monopolistic services provided by Bezeq to include building and operating the public telecommunications infrastructure, basic telephone services, international telecommunications services, packet switching, telex, supplementary telephony services, microwave links, and prime telephone sets.

Liberalizing the structure of the telecommunications industry must be achieved, the committee maintained, before Bezeq privatization could continue. The Maoz committee wanted to refine the "structural control" policy, regarding provision of competitive services, by allowing Bezeq to provide competitive services through subsidiary companies, controlled by Bezeq, or by companies controlled by Bezeq's holding company. Bezeq's holding company would not be allowed to control more than one company providing a specific nonmonopolistic telecommunication service.

Other changes were suggested in the previous policy paper and general license, among them allowing Bezeq (in some cases through subsidiary companies) to be actively engaged in all forms of telecommunications services, ensuring removal of cross subsidies before introduction of competition in international telecommunications, ensuring fair competition regarding royalties in competitive market segments, and re-examining financing of Bezeq investments in preparedness for national emergencies and changes in tariff policy.

After a long and tedious process, a new Bezeq general license was finally issued by the subsequent minister of communications on 1 March 1994 (Ministry of Communications, 1994a), reflecting the Maoz committee's recommendations with minor changes (among them the abandonment of the holding company concept). This represents a starting point for a new regulatory regime in Israeli telecommunications, the structural regulation regime.

In a response to the new license requirements, Bezeq split its nonmonopoly activities into subsidiaries. Thus, during 1995, four major subsidiaries were formed: Pelephone (50% owned by Bezeq, 50% owned by Motorola Israel), providing cellular services; Bezeq-Bit, providing residential and small business terminal equipment (100% owned by Bezeq); Bezeq-Kol, providing business enterprise telecommunications systems and customer-premises wiring (100% owned by Bezeq); and Bezeq International Projects, undertaking overseas activities, partnering in telecommunications projects in East Europe and Asia (100% owned by Bezeq).

5.3.4 *Bezeq's Privatization*

In early 1990 a committee of ministers decided to sell part of the government ownership in Bezeq to the public through a privatization process. The decision was gradually to transfer to private ownership up to 25% of government equity in Bezeq, out of which 1.25% would be offered to Bezeq employees (Government of Israel, 1991).

The decision was part of a national policy to replace government activity with free market forces and was complemented by reforms in labor laws, the tax structure, and the capital market. The main object was to help the economy utilize domestic resources in order to achieve economic objectives at a national level rather than asking for assistance from abroad. Thus, the government chose privatization to mobilize internal resources rather than to achieve efficiency in the telecommunications sector. It aimed to enlarge and strengthen the private business sector so that businesses could take a leading role in economic growth and help support the 1 million immigrants then expected to arrive over the next few years in Israel.

As a direct result of this decision, a package was offered to the public in September 1990 composed of shares and option debentures that were convertible into shares until September 1992. Thus, 5.15% of the governments' share holdings went to the public and 1.2% to Bezeq employees. The offer was highly successful. The reaction of the stock market was 420% in excess demand. When the options are released, the government's shares in Bezeq were expected to decrease to 91%.

The sale of shares did not bring any monetary benefits to Bezeq itself. However, direct results of the first Bezeq share offer to the public were the creation of a firm, stated government policy regarding telecommunications tariffs; a change in Israeli law banning government interventions in Bezeq's commercial decisions; and enhancement of Bezeq as a major body in the Israeli stock market; and the raising of resources to finance national goals (Eldad and Goldberg, 1991).

In May 1991 the government implemented a second offering that fulfilled its early commitment to release 25% of its ownership in Bezeq. Once again the result was substantial excess demand and a high price per share. Nevertheless, the main achievement is the change from a wholly public holding into a partially private one.

In July 1991 the government decided to continue with the sale of Bezeq shares, reducing government holdings to around 28%, and to look for a strategic alliance with a foreign public network operator.

Following the June 1992 general elections, the Labor party came to power after 15 years of Likud government. One of the top priorities of this government was privatization of government-owned enterprises in order to achieve higher efficiencies through better, businesslike management, which would stimulate economic activity and achieve a higher growth rate of the national economy. Privatization was also considered as the means for raising capital and reducing the public deficit.

As a part of this policy, the new government created a special ministerial committee for privatization, headed by the prime minister. One of the major topics on the agenda of this committee was Bezeq's privatization. The two main methods discussed were continuous floating of shares to the general public through the Israeli stock exchange and selling 14% control shares to a strategic partner (the

partners considered were major operators from abroad or major Israeli corporations). After a heated discussion, and mainly because there was resistance to allowing a foreign party to control the strategic telecommunications infrastructure, the government decided in February 1993 to postpone this decision. It was decided that the government would retain control over 51% of Bezeq's shares, and the remaining shares would be offered on the Israeli stock exchange. Privatization would take place after liberalization of the Israeli telecommunications marketplace, namely, after competition in cellular telephony and international telephony was introduced. In 1995 the government prepared a third Bezeq offering, parallel with a tender for two additional international service operators.

Another interesting event that occurred during 1995 was the acquisition by Cable & Wireless from the public of 10.1% of the ordinary share capital of Bezeq, thus becoming a major shareholder and having a seat on Bezeq's board. Cable & Wireless paid \$101 million for its first lot of Bezeq shares (7.01%), 18% above the Tel Aviv Stock Exchange market price (Sandler and Dwyer, 1995).

5.3.5 Tariff Restructuring

Starting in 1985 a cyclical policy of freezing tariff rates was implemented under a state of high inflation. The result was a persistent decrease in the profitability of Bezeq. To a large extent it also affected the relative structure of rates and their linkage to costs.

Early in 1987 the MoC began to recognize the difficulties inherent in cross subsidization as well as the need for competition in order to develop the industry. The readjustment of tariff rates and structure was the first step toward a policy of liberalization and privatization. A committee was appointed, headed by A. Fogel, to suggest consistent rules for tariff setting to be valid for five years. Bezeq and outside experts played an important role in the study that lasted a whole year. As a result, criteria for tariff adjustment were set. The basic principle was that there would exist a maximum level in the form of price caps to the domestic and international services. The caps were to be adjusted according to the inflation level with compensation for productivity increases (Government of Israel, 1989).

Over five years, this procedure was supposed to decrease real telecommunications prices by 20%. In the benchmark period there was a tremendous distortion in the allocation of costs to the various services. Thus, over the whole period a set of readjustment rules were elaborated to eliminate cross subsidies gradually. There were particularly large cross subsidies between access and call charges, between local and toll charges, and between domestic and international calls; international calls are heavily surcharged.¹ Data communications and dedicated circuits, excluding the local components, were overcharged.

The Fogel committee suggested closing gaps between tariff rates and their relative cost within a period of five years, starting in 1989. Rate restructuring was to be done in two major steps: a once-and-for-all change in the rate level and structure and further examination by the regulatory body, the MoC, of cost methods and practices that are pursued by Bezeq. The preferential order for restructuring

the tariff rates was suggested to be (1) dedicated local and toll lines, (2) international telecommunications services, (3) data communications rates, and (4) local and interregional rates. By November 1989 adoption of the recommendations was designed to generate an 8.5% rate of return on equity. From then, the rate of return would become a variable determined by growth and efficiency improvements. This required an immediate change in rate level of 22%. Politically, this was difficult to defend, and thus it was split into two parts, 10.4% in December 1989 and 10.4% in June 1990.

The price cap policy was adopted, and even though it has not been fully implemented, it is now a major ingredient that it is hoped will introduce new order in the industry, eliminating excess and artificial demand for underpriced local calls and local private lines and enhancing the demand for international calls, data communications, and all types of new information services in which the old tariff structure had actually been a type of heavy taxation. The entire set of telecommunications tariffs for the private investor in the telecommunications infrastructure and services will be changed toward cost-sensitive levels.

As prescribed by the Fogel committee, a new committee was appointed by the MoC in October 1992, headed by S. Shorer, to suggest tariff adjustments as of 1 January 1994, tariff readjustment rules, the period during which these rules would stay valid, and the means to eliminate (or minimize) cross subsidies. The Shorer committee presented its report in November 1993 (Government of Israel, 1993). The main suggestions of the committee were (1) a general reduction of Bezeq tariffs as of 1 January 1994, meant to achieve an overall average reduction of 5.3%, with internal adjustments to reduce cross subsidies; (2) keeping the Fogel tariff updating procedures (tariffs updated whenever the accumulated increase in the consumer price index is near or above 8.5%; adjustment by RPI minus productivity increase factor) while changing Bezeq's productivity increase factor from 3.5% to 6.5% per year in the first 2.5 years and updating this factor within plus or minus 1% afterwards; (3) reducing cross subsidies by gradual change of balance between local and international tariffs at every tariff update; (4) reducing the government royalties (The details were left to the decision of the MoC, which reduced government royalties from 11% to 8% on all Bezeq's income.); (5) accepting the Fogel recommendation regarding Bezeq's return on equity, planning for 8.5% rate of return; (6) validating the procedure for a period of five years; and (7) establishing an independent regulatory body, with statutory powers, to regulate Bezeq's tariffs and monitor quality of services.

One of the precedents established by the Fogel and Shorer committees was adding major periodic tariff adjustments to the price cap mechanism, ensuring that Bezeq's return on equity would not deviate from the prescribed 8.5% and introducing a periodical offset in the cross subsidization elimination effort.²

5.3.6 Market Liberalization in the 1990s

The 1990s have been characterized by increased liberalization. A new cellular operator, Cellcom, started operation in December 1994 after winning an international tender. A tender for two additional international telecommunications opera-

tors was approved for 1996, and the MoC is discussing Personal Communication System (PCS) tenders. A cable television shopping channel was licensed during 1995. Several operators provide international call-back services.

As of December 1994 the MoC has issued over 500 types of approvals for customer-premises equipment (telephones, multiline equipment, facsimile machines, and modems) and over 50 special licenses for value-added services (information technology services, voice mail services, and Internet providers).

Following a MoC decision and a limited trial, liberalization of enterprise-premises telecommunications systems is under way. It will allow large customers to own and manage their internal private on-premises telecommunications system (for example, internal wiring and PABX), which has until 1994 been the monopoly of Bezeq.

The liberalization of the telecommunications market allows for many small businesses to engage in related activities: production, trade, and service of customer-premises equipment; operation of value-added services; and consultation.

During 1991, the government approved the AMOS program of the Israel Aircraft Industries for the launching of two small communication satellites (with Ku-band transponders) to a geostationary orbit at 45 degrees east. Launching took place in 1996 with an estimated investment of \$200 million.

Telemesser, a small privately owned company, is the leading provider of voice mail-box services, offering a wide array of voice store-and-forward services over the telephone network. Two other small similar service providers are Tele-Clal and Euronet.

Operation of value-added voice services began in 1992 when Bezeq created access and billing arrangements over the Public Switched Telephone Network (PSTN). The services are called "056" services (similar to the "900" service in the United States). Unfortunately, most services were of pornographic nature, about 720,000 customers asked for the service to be blocked, and the MoC revised the licensing rules, limiting the use of "056" services for entertainment and creating a "057" service for other voice information services. Access to the "056" service is granted only according to a specific request of a telephone subscriber.

During 1995, Bezeq received a license for a video on-demand trial, and the cable television companies received a license for a multimedia trial. Some of the cable television companies started to offer on an experimental basis pay-per-view channels.

Standardization has a major impact on the development of competitive telecommunications services. Israel faces a complicated telecommunications network (mixing European and North American standards) and difficult problems in implementing the Hebrew language in information technology services,³ especially in multilingual systems. A joint effort of Israeli industry, headed by the Standards Institution of Israel (SII), aims to develop standards for telecommunications and information technology applications (Rosenne, Perry, and Yuklea, 1987). The standardization effort is carried out as a "market-oriented" activity, dedicated to solving the unique problems of the Israeli marketplace, only in those areas in which international standardization cannot be used. Special emphasis is given to interfaces to the public telecommunications network, for both voice and data services, as well as to aspects of language implementation such as control

sequences, character sets, naming and addressing, the directory, and virtual terminals (Perry and Rosenne, 1989).

5.4 Telecommunications Networks and Services

5.4.1 Telecommunications Infrastructure

Israel has a modern telecommunications network, which by the end of 1994 included 2.1 million main telephone lines, of which 81% are connected to modern digital exchanges, providing 39.2 main lines per 100 inhabitants. Digital transmission is provided at all network levels, from PABX connections in the local loop to long haul trunks, utilizing modern monomode optical fibers, existing coaxial cables, and symmetrical pairs. Digital technology provides 95% of the channel capacity in the transmission network.

The digital exchanges are manufactured by local industry (Tadiran and Telrad), based on the Alcatel-Bell System 12 and Northern Telecom DMS 10/100 technology. By 1993 all tandem switching was digital, and electromechanical switching was used only for local switching. By 1997 all switching and transmission will be converted to digital technology. A program to convert to common-channel signaling system CCITT # 7 was initiated in 1990 and completed in 1993.

The transmission "highway" is based on 140 Mbit/s and 565 Mbit/s PDH, as well as 155 Mbit/s, 622 Mbit/s, and 2.5 Gbit/s SDH links over monomode optical fiber cables. Transmission redundancy is supported by 140 Mbit/s microwave radio links. Existing (analog) coaxial cable systems were modified to 34 Mbit/s or 140 Mbit/s digital transmission, and some of them are still in operation. The common local transmission method was 2 Mbit/s digital transmission over symmetrical pairs, but since 1990, no new systems have been installed, and all new local transmission systems use optical fiber. Bezeq is leaning extensively on technologies for better use of its copper local network, mainly digital 0+2 pair gain systems, and has already started trials of new technologies in the access network, such as high speed digital subscriber line (HDSL), fiber to the curb (FTTC), passive optical networks (PON), and hybrid copper radio (HCR) wireless local loop (WLL), in order to implement them on large scale during 1996.

There is a wide range of telephone services. These comprise 19,000 public telephones, free phone ("177") service, customer features (including free-of-charge tone dialing, call waiting, follow me, three-way calling and others), directory services ("144"), international operator services ("188"), audiotex services ("056" and "057"), wake-up service, detailed billing, phone cards, and Integrated Services Digital Network (ISDN).

A telex service, based on modern Siemens EDX access/tandem exchanges, supports about 3,000 subscribers (their number is rapidly declining) and has wide international connectivity. A domestic satellite service, utilizing leased transponders in INTELSAT satellite, is used for television distribution and data transmission.

Bezeq invested enormous resources in quality of service improvements. Some major activities involved in this effort include building a modern infrastructure

capable of immediate response to customer demands for new lines and transfers, improving the traffic flow in the switched telephony network, transferring customers from heavily loaded electromechanical switches to new digital switches, improving the local loop, implementing computerized trouble reporting and remote-testing facilities for local loop maintenance, transforming the manual data base to a modern computerized system and constructing computerized maintenance and network control centers, local metering and computerized billing for all electromechanical switching equipment, and improving public facilities, including business offices, service stations, directory information services, and public pay phones.

Israel's international communications are expanding constantly. The international connectivity is based on submarine cables and satellites. A coaxial submarine cable in the Mediterranean Sea (from Israel to Italy) has a capacity of 1,380 telephone channels. An optical fiber submarine cable was put into service in December 1990, connecting Turkey, Greece, and Israel through a three pair submarine optical cable to Italy (Palermo, Sicily) via branching units at sea and providing 280 Mbit/s digital connections from Israel to Italy, and from there to France, Spain, and the transatlantic network. A repeaterless optical fiber submarine cable connecting Cyprus and Israel was inaugurated during 1994.

The Emeq Ha'Ella earth station uses Atlantic Ocean region satellites and Indian Ocean region satellites, providing telephony and data and video services. The Gal-On earth station uses other Atlantic Ocean region and Intersputnik satellites. Digital satellite communications are provided using IDR/IBS modems and digital circuit multiplication equipment. A Bezeq satellite teleport in Ayalon (near Tel Aviv) and some private teleports are providing data and video services to the business community.

All the telephone customers in Israel have direct international dialing to more than 100 countries. Common-channel signaling system CCITT #7, as well as international ISDN, were introduced on major international routes.

5.4.2 Data Communications and Information Technology Services

Data communications networks and services are of extreme importance to Israel's economy. A special national steering committee (Government of Israel, 1986), appointed by the government in 1983, focused on a major backlog in the supply of data communications. Since then, Bezeq has almost reached the point of satisfying the demand for data communications.

Leased point-to-point data lines, operating through analog modems, are used for data transmission at speeds of 2,400 to 19,200 bit/s and are the basic transmission facility in most private data networks. About 12,000 such lines were in service in 1995. Bezeq does not supply modems, which are type approved by the Ministry of Communications and owned by the customers. A major policy change regarding these leased lines was a 1989 tariff change that priced leased lines according to line quality instead of according to bit rate.

Bezeq provides a domestic digital data transmission service called SIFRANET. The basic service provides point-to-point leased digital data lines. In 1995 about 9,000 such lines were in service. Bezeq supplies the network termination at customer premises and creates a virtual circuit between these termination points,

utilizing a special TDM infrastructure (Rosenne, 1989a). Circuits are provided with bit rates of 2,400 bit/s to 2 Mbit/s.

Until 1988, international leased lines used analog channels and were limited to 19,200 bit/s. Since then, Bezeq has begun to supply digital international leased lines at 64/128 kbit/s and higher bit rates using IBS or IDR satellite modems. This service is now also provided through submarine cables. As of 1992, three companies, ISRASAT, DARCOM, and EURONET, were licensed to set up satellite teleports and provide a competing international satellite service.

The Israeli packet-switched public data network (PSPDN), called ISRANET, supports domestic and international permanent X.25 and temporary dial-up connections, using analog modems over the public-switched telephone service, at bit rates of up to 14.4 kbit/s. By 1995 the network supported 1,500 fixed X.25 connections and 2,500 dial-up users and is connected to more than 40 similar X.25 networks worldwide. During 1994, frame-relay services were successfully introduced to the ISRANET service; they supported permanent connections with bit rates up to 2 Mbit/s. This service has some 500 customers and enjoys an enormous growth rate, mainly for local area corporate networks interconnect applications. Competing international packet-switching services are provided by local BT-MCI Concert node (operated by Tadiran Operations) and a SprintNet node (operated by CLALCOM).

Bezeq introduced a high-speed (2 and 34 Mbit/s) Metropolitan Area Network (MAN) service in 1993. The service usage is limited to very few customers, as the customers favor more standard and cost-efficient frame-relay service. Bezeq began a narrow-band ISDN pilot service in 1994 and is planning to supply country-wide commercial service during 1996, in accordance with its long-term plan (Rosenne, 1989b). Bezeq is concentrating on basic 2B+D and primary 30B+D ISDN connections, providing different types of network termination and PHI connectivity to the ISRANET network.⁴

5.4.3 Value-Added Networking Services

While still requiring a license from the MoC, value-added networking services using the Bezeq infrastructure are highly competitive. Typically, these services have been offered over switched-voice and data or dedicated-data communications lines, but we have begun to see the beginning of use of television and cable as channels for providing value-added networking services.

The more traditional services being offered are access to on-line data base and other information services. This market is largely controlled by two major players, Trendline Information and Communication Services Ltd. (Kav Manhe) and Goldnet (Bezeq Zahav). Trendline is a leading provider of financial information originating from the Tel Aviv Stock Exchange and offers a continuous real-time flow of information directly from the trading floor. As a complement to this service, Trendline provides its customers with Financial Markets Data Services from over 20 international exchanges. Trendline is also the representative of CompuServe (claiming over 2,500 Israeli users), Dow Jones/News Retrieval, FT Profile, Investext, and EUR-OP and provides Internet access. Goldnet is a partnership

whose major owners are Bezeq and AT&T EasyLink Services, with minority ownership of Bynet Communications and Malam. Goldnet offers a messaging service based on AT&T Mail. Goldnet also represents and provides access to Lexis/Nexis, a major on-line service provider in the Reed-Elsevier group of companies, Questel/Orbit Infomaster, CD Plus, and Newsnet. Goldnet offers a series of Israeli data bases, such as access to the Israel Registrar of Companies, "Red Lights" credit information service, and real-time and historic information from the trading floor of the Tel Aviv Stock Exchange. Goldnet is also beginning to offer Internet services. The services of both Trendline and Goldnet include on-line access bundled with telecommunications connectivity. One can also access on-line services directly using Bezeq's X.25 network, ISRANET; larger companies and institutions heavily use this route, as do individuals, accessing Dialog and MAID, examples of two of the popular destinations.

Internet access was limited prior to 1993 to only research and development institutions through Reshet Ilan, the Israeli universities' Internet access. As of 1993, the MoC allowed Reshet Ilan to provide direct leased-line service to the research and development units within industry and allowed four companies (Trendline, Goldnet, DataServe, and ActCom) to connect by leased line to Reshet Ilan and then to provide dial-up service to the same type of units. These units needed to receive prior written permission from a government, university, and industry committee before being allowed either dial-up or leased-line service. In May 1994 the first two commercial Internet providers were licensed, elroNet, a division of Elron Electronic Industries Ltd., and NetVision, a subsidiary of Net-Manage Ltd. These two companies have since merged their operations, operating under the name NetVision and including a third, foreign owner (the U.S.-based PSINet). The four companies previously restricted to providing only research and development services were allowed to increase their offering, and during the following year, 12 additional companies were granted similar licenses. In 1995 less than half the companies had serious operations with international interconnections to the Internet through leased lines to the United States.

Another interesting activity is managed network services. Domestic wide area network managed network services are offered by several Israeli companies. International one-stop-shopping managed network services are offered by Israeli companies representing Sprint and BT-MCI as well as NetVision.

The Postal Authority's activity in value-added services is through its "rapid services" product line, which is based on the SHOAHAM system: integration of express services such as postal branches, couriers, telex, facsimile, and telephony serving registered customers or occasional users. Following a public tender, SHOAHAM services are being operated for the Postal Authority by a private company, Elitech.

TV-Tel is a national on-line integrated information and shopping service provided by a consortium of leading Israeli corporations (Bezeq, Elbit, and Tadiran Operations). The TV-Tel system allows users with personal computers (or specially equipped television sets) to log on to TV-Tel by using a 14.4 kbit/s modem and dialing a uniform PSTN access number ("133"). TV-Tel offers modern Hebrew graphic user interface, providing the user with a uniform, easy to use, and

friendly interface to a variety of services: data bases, purchasing items, financial transactions, family entertainment (individually or in groups), interaction with municipalities and government services, bill paying, ticket buying, e-mail and Internet access, and much more. The service was launched experimentally in February 1994 with 500 users. Following the success of the experimental service, commercial service began in February 1995. Six months later, the service had 5,000 customers, which produced 1.3 million minutes of use (with an average tariff of \$.04 per minute, and some services reaching \$.12 per minute), utilizing about 100 different services provided by five "service hubs."⁵

5.4.4 Land Mobile Services

Mobile services are popular in Israel. The MoC exercises its control over the use of the frequency spectrum and issues licenses for every radiation-emitting device. Two competing carriers operate cellular telephony services under general licenses, and special licenses are provided for trunking and paging operators. The market for equipment is regulated, and some 500 licenses for selling and servicing of equipment were issued. The major mobile services are cellular telephony, two-way radio, paging, and radio alarms and control.

Cellular telephony was initially provided by Bezeq in cooperation with Motorola Israel. Motorola Israel won an international build-operate-transfer (BOT) bid in 1984 and made the initial investment in return for a 10-year revenue-sharing scheme. During 1994, following a tender for a second cellular operator, Bezeq and Motorola Israel set up a jointly owned company, Pelephone, providing the cellular service (utilizing NAMPS technology), and a second cellular operator, Cellcom, began operations (utilizing TDMA technology). In March 1995 there were about 200,000 cellular customers (Pelephone had about 150,000 customers and Cellcom about 50,000 customers), and the market is growing fast. It is predicted that the quantity of cellular users will almost double during 1995, mainly due to the extremely low initial tariffs of Cellcom.

In March 1995 some 165,000 licenses for civilian land mobile equipment were provided, mostly for private networks. Analog trunking networks were set up by two operators, Motorola Israel and Rotcom/Iturit, and a digital trunking network began operation in 1995. Five paging operators offer numeric and alphanumeric services to some 75,000 customers. Five operators serve approximately 55,000 radio-alarm and control stations. Calling party pays in cellular service was introduced during 1994, meaning that air time for calls from a fixed telephone to a cellular handset is paid by the fixed telephone subscriber. It is also planned to introduce calling party pays into paging services. Frequency spectrum availability limits growth of mobile services. Cellular operators are allocated 20 MHz each, about 200 two-way radio terminals are used per each 25 kHz channel.

5.4.5 Network Modernization

Network modernization is the focus of telecommunications development. Bezeq's modernization strategy is based on (1) implementing mature technology, (2) uti-

lizing strong local capability, (3) having multiple suppliers for all major network components, (4) balancing investment in various network elements, (5) building advanced MIS support, (5) emphasizing personnel training at all organizational levels, and (6) paying careful attention to data telecommunications networks.

The implementation plan called for phased implementation. The first phase (1982–1986) was based on the “digital islands” strategy and included outside plant modernization, utilizing modern cables and street cabinets and changing the local access copper network architecture from rigid to flexible service area structure, and introduction of digital switching and MFC R2 signaling, of digital transmission over existing symmetrical pair cables and existing coaxial cables, and of digital radio.

The second phase (1987–1991) was based on the “digital highway” strategy and included further expansion of digital switching, introduction of signaling system #7, and a phased replacement of electromechanical switching, starting with electromechanical tandem switches and step-by-step local switches. High-speed fiber cable digital transmission was implemented in large scale. The public started to enjoy improved and advanced services, such as tone dialing (DTMF) and “green number” free phone services.

The third phase (1992–1996) could be described as the narrow-band ISDN era, with modernization plans focused on enhancing the competitive posture of Bezeq in the liberalized environment, and calls for replacement of the remaining local step-by-step and crossbar electromechanical switching and introduction of modern services such as narrow-band ISDN and intelligent network services. A major effort is directed toward local loop modernization, including better utilization of existing copper network by DSL and HDSL pair gain systems, optical fiber in the local loop, and wireless local loop. Implementation of SDH transmission technology has been done on a large scale, including high-speed trunks, survivable rings, and digital cross-connects.

The plans for broad-band ISDN implementation are well advanced and call for large-scale introduction of broad-band Asynchronous Transfer Mode (ATM) switching and advanced local network (optical fiber and wireless local loop), in parallel with other activities: advanced intelligent network, personal communication services, and residential broad-band services. Pilots and trials are being carried out. One of the major efforts combines Bezeq and local industry in a consortium devoted to the development of broad-band telecommunications technology, in order to achieve competitive edge.

5.4.6 Broadcasting and Cable Television

Until 1990, broadcasting was performed by the Israel Broadcasting Authority (IBA), operating under the 1965 Broadcasting Authority Law (Knesset, 1965), the military broadcasting station (Galei Zahal) and two “pirate” off-shore AM/FM radio stations (Voice of Peace and Channel 7).

The IBA broadcasts seven different radio programs: five domestic programs (of which two have country-wide AM and FM coverage, one has only FM coverage, and two have only AM coverage), one high-power AM program in Arabic for

Israel and the Middle East, and a shortwave program for world-wide coverage. Galei Zahal provides country-wide AM and FM coverage.

Television in Israel is based on the PAL standard. Channel one, an IBA channel, provides country-wide coverage and is operated in a "shared use" concept—the daily broadcasting schedule is divided between Educational Television (an organization that reports to the Ministry of Education), Television in Arabic, and General Television (belonging to the IBA). A commercial channel, Channel two, began operation in November 1993. A third television channel, Channel three, began full operation in 1995. Channel three is operated by the IBA and is used mainly for cultural purposes. The general television channel transmissions are based on 54 VHF/UHF transmitters, while transmissions of Channel two are based on a combination of terrestrial delivery, using seven UHF transmitters, and satellite transmission. It is planned to add eight more transmitters for Channel two in order to increase terrestrial coverage. Channel three utilizes only satellite distribution. Domestic satellite transmission of all three television channels is based on Bezeq's leased INTELSAT transponders. The cable television operators distribute all three channels.

The law for the second television and radio authority was approved by the Knesset in January 1990 (Knesset, 1990). It provides for an independent authority to operate the second television channel and regional radio stations on a commercial basis. After setting the commercial operations of Channel two, the authority began to issue public tenders for local FM radio stations, of which the first four stations (out of 16) began transmissions in September 1995.

In August 1986 the Knesset approved a change in the Telecommunications Law (Knesset, 1986b) to provide the legal basis for cable television operation. The Ministry of Communications divided the country into 31 areas. Franchises to cable television operators began to be issued in March 1990 following public tenders. By the end of 1990 transmission began in 10 out of 31 areas, and cable television reached about 90,000 households. In August 1995, 850,000 households were connected (65% of total households, 70% of homes passed). It is still unknown when customers in peripheral areas will be connected, which causes a concern to the MoC (Ministry of Communications, 1994b). The cable television operators provide more than 35 channels: television programs from Israel, neighboring countries, and worldwide reception (by satellite); film channels; and local programming. The cable television networks are built utilizing fiber-based feeders and "tree and branch" coaxial distribution systems.

5.5 Discussion

Despite continuing economic problems, Israel has achieved outstandingly in the field of telecommunications. However, in retrospect, the progress has always lagged behind customers' requirements.

In the first 35 years of its existence, 1949–1984, the telecommunications industry was organized as a nationalized system, a market structure well suited to an underdeveloped economy. No private initiatives were available to support infra-

structure development. The central government pursued the role of establishing the foundation of the industry by marketing its services to the public and by generating an expanding demand for the industry's product. While the government was successful in achieving this target, it faced difficulties in running the business efficiently (Hai, 1976b).

First, government by nature is ill adapted to decision making of the type needed to run an industry. This caused vital decisions to be delayed to a point at which they were no longer relevant to the changing conditions of the telecommunications system.

Second, investment activity in telecommunications was linked to the national budget. Thus, even though sufficient internal funds were generated that could have been reinvested, telecommunications had to compete with all other public projects for resources. Subject to the national policy makers' manipulations, it suffered from a consistent shortage of funds.

Third, as a state industry, telecommunications was inevitably dependent on political pressures in addition to the pressures exerted by economic groups. A noticeable example was the wide range of social groups entitled to a special reduction in their telephone charges.

Fourth, tariff rates were manipulated in order to generate revenue for government instead of being used to ensure the most efficient use of scarce resources by the industry. This created a discriminatory rate structure, catering to specific social needs with an inadequate tariff level and a resultant excess (or lack) of demand for industry's services.

Finally, the industry operated under circumstances of excess demand that were totally insensitive to the standard of service provided and generally learned to accept as a given the country-wide dissatisfaction with the quality of service.

In the period between the mid-1970s and the early 1980s, distortions in the allocation of resources, lack of funds, excessive political penetration of management, and delayed technological progress led to underachievement across the whole range of telecommunications, as manifested by an increasing demand for its basic product, the telephone line.

While these economic distortions could be tolerated under circumstances of generating demand for telecommunications services, they became a real obstacle in an upward-moving economy. It took almost 20 years and several task groups at the national level to recommend conversion of the market structure into a quasi-private enterprise that would start to function as a profit-motivated industry in order to eliminate shortages and provide needed services. These changes were, in general, in line with similar moves in telecommunications industries throughout the world.

The Israeli experience illustrates the advantage of maintaining a natural monopoly in the initial stages of telecommunications development while encouraging limited competition, such as in the field of customer-premises equipment. Such a policy is however not necessarily the optimal one during subsequent stages and thereby requires a process of continuous revision.

The government has continued to control activities in this industry. While the Telecommunications Law of 1984 was highly detailed as to the role of Bezeq in the market, it left the issues of regulation quite open and surrendered a great deal

of freedom to the MoC in dealing with the sector. Nevertheless, individual entrepreneurs have entered the industry in specific areas in order to provide value-added services and modern information facilities and services.

Empirical evidence from the path of growth as discussed earlier shows that the conversion to a quasi-private body was highly successful. It provided an incentive for maximum growth within a limited span of time; for example, over the first five years of Bezeq's existence the outstanding demand for basic product and services was met.⁶ Technological changes were adapted very swiftly into the infrastructure to modernize at minimum costs to the national economy. Bezeq succeeded in acquiring the necessary development capital from private sources in Israel and abroad. Equipment manufacturers in Israel expanded their capacity to support Bezeq's needs under a competitive environment relying on key international sources, adapting state-of-the-art technologies in switching, transmission, and customer-premises equipment. Even auxiliary industries that provide complementary resources have found themselves adapting to a high standard of technical and industrial requirements. Quality of services became a central management issue and has penetrated the industry in the form of strict requirements for suppliers and Bezeq personnel. Empirical estimates do not reflect the entire improvement because the rapid rate of growth in the network exerts a countereffect on the quality of the service. Telecommunications reorganization included extensive changes in Bezeq's labor force. This enhanced the capacity of top management to benefit from internal economies of scale in steering the company toward clearing the outstanding demand.

In general, advanced technologies can be seen as a barrier preventing a country's advancement or as a lever for development. Israel has used telecommunications technology for the latter. In particular, several factors have favored the early implementation of advanced technologies in Israel. First, they have been made available both to industry and to the national operators of the telephone and postal services through alliances with organizations using these technologies in the developed world. Second, the national character readily adapts to new technologies. Third, although heavily unionized, national unions never felt that the introduction of these technologies should be prevented but rather worked with the national operator in their implementation, to the benefit of their members as well as the general public. Fourth, there has generally been cooperation between the industry and Bezeq in the implementation of new technologies.

Operationally, Bezeq and the other new enterprises active in telecommunications are regulated by the MoC, which plays the role of telecommunications watchdog, the Ministry of Finance, as a coordinating office for nationwide resource allocation, and the Finance Committee of the Knesset, as the tariffs control board. These three bodies create regulatory machinery that does not necessarily act in the same direction.

The regulators are under continuous pressure from different directions—the general public, which seeks better services for lower tariffs; Bezeq, which struggles to improve service delivery and quality while fighting for freedom of management and economical tariff structure; and various business forces, which maneuver different political forces in order to achieve a part in the growing

telecommunications business. These forces create a slow re-regulation process, enhancing competition but only in a step-by-step process.

The belief that the national economy could improve from liberalization and competition in telecommunications, together with strong business and political forces aiming to gain some part of the telecommunications pie, were the major forces behind the restructuring of Israel's telecommunications, which began during the 1990s.

The process of restructuring the telecommunications sector and the introduction of competition is still in its beginning, and no conclusions on the process and its possible outcomes can be drawn. There is no doubt that the undertakings of the MoC are changing the telecommunications arena, from a Bezeq monopoly to a competitive marketplace (although Bezeq is still the major force in Israel's telecommunications).

The real question is whether the competition will continue to evolve to the benefit of Israel's consumers and economy. It seems that there is a general support for the introduction of competition in telecommunications, although there is concern about the following points:

- Government involvement. Government involvement, under the new evolving regulation, remains extremely high. Competing telecommunications service providers are and will continue to be dependent on various decisions of the MoC. Unless regulation is relaxed, no free market will evolve.
- Frequency spectrum availability. The key resource that can create competition in telecommunications is the availability of the frequency spectrum to competitive service providers, thus providing them with the means to compete against the "natural monopoly" in the access network and participate in the growing area of portable and personal services. A major change in the frequency spectrum regulation was approved in January 1994 (Knesset, 1994), in which the use of the spectrum is subject to a tariff, and service providers pay monthly tariffs to the government for their frequency allocations. Tariffs are higher for frequencies below 1 GHz. Tariffs for microwave links are dependent on overall bandwidth, link length, and frequency (the wider the bandwidth, the longer the distance, the higher the tariff; the higher the frequency, the lower the tariff). It is believed that frequency spectrum pricing will bring about an economic approach to frequency utilization, allowing for better use of this limited resource. Despite the change, the MoC, as yet, is not developing a major effort to provide frequency spectrum for competitive service providers. This is because the frequency spectrum in Israel is an extremely scarce resource, due to the defense community requirements and the geopolitical position of the country. Provision of a few hundred megahertz of frequency spectrum to be used by competitive telecommunications providers is a key issue in developing competition in telecommunications, as well as the provision of modern services by the existing operators. The spectrum can come from more efficient allocation of the broadcasting spectrum, as well as re-allocation of frequencies used by the Israel Defense Forces.

- Investment in infrastructure. Telecommunications infrastructure requires enormous investments. Will the new competitive environment allow operators to make the huge investment required to continue the development of Israel's telecommunications infrastructure? Can the investment be justified on business decisions, knowing the instability of the marketplace due to fierce price competition and high government (and political) involvement? Could it be that competition will mean that investment in infrastructure will actually slow down, depriving Israel of modern services?
- Tariff restructuring. Will the government succeed in removing cross subsidies from telecommunications tariffs? Will the government succeed in achieving fair and economically based interconnection tariffs, important for the creation of the competitive market for telecommunications services? Will Bezeq reach a reliable cost accounting system that will be open to the public and that will actually reflect a cost-based tariff system?
- Universal service provision. As in the case of the cable television operators, competitive providers may offer service only in populated regions and may not be willing to spend resources in peripheral areas. It is still to be seen if Cellcom, the second cellular operator, will actually provide quality country-wide coverage. What effect will removal of cross subsidies have on universal service goals? Will the regulator introduce new mechanisms, forwarding universal service goals?

It is debatable whether Israel is ready for a totally deregulated free telecommunications market. The question is whether free competition can actually exist in a small market such as Israel, and whether free competition can assure long-term investment in telecommunications infrastructure. Also debatable is whether Israel can "experiment" in free competition in telecommunications or whether watching competition develop in other countries and learning from other nations' experience is not a better course of action. However, this is not the course of action chosen by the last few governments; instead, it appears, other countries will be learning from Israel's experience.

By its very nature, telecommunications is a field in which free competition rarely exists. Public control policy needs continuous modification, and the optimal mix of imperfect markets should be sought. Regulatory agencies should continuously screen the system in order to identify those branches of industry that can be operated most efficiently while ensuring the maintenance of a certain degree of competition in the rest of the industry. One question remains—will the Israeli regulatory system evolve in the pattern that will ensure continuous growth and development of the telecommunications sector?

Notes

All ideas expressed in this chapter represent the views of the authors themselves and not necessarily of the organizations that employ them.

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and Control Division, and David Hyman, Bezeq assistant vice president for marketing and customer services.

1. It should be pointed out that local call tariffs are based on measured service. Flat-rate local service does not exist.
2. It should be mentioned that Bezeq makes the following payments to the Ministry of Finance: (1) royalties of 8% on providing basic services (the royalties were 11% up to January 1994); (2) regular income and property taxes (as do all corporations in Israel); (3) mandatory dividend allowance on after-tax profits.
3. Hebrew is written from right to left, using a unique character set.
4. ISDN services are implemented according to ETSI standards and the European ISDN MOU (which Bezeq signed in 1994).
5. One-time registration fee is \$25 for customers with a modem or \$100 including 14.4 kbit/s modem. Each registered user receives a personal hardware security plug.
6. Bezeq overcame the long waiting list and also supplied an annual addition of 120,000 orders.

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Appendix: Statistical Tables

See pages 117 to 125.

TABLE 7.1. Development of the telephone system

Year ending 31 March	General Data					Direct Lines Installed ^b			Orders Received ^c	
	Exchange Capacity ('000)	Lines Connected ('000)	Total Propensity ('000)	Total Demand ('000)	Total ^b	New Subscribers	Transfers	New Lines	Transfers	
1976	718	597	737	182	68,200	53,790	14,410	78,800		
1977	793	642	782	181	68,710	51,850	16,860	61,700		
1978	831	686	835	193	71,340	49,100	22,240	75,800		
1979	864	731	897	217	70,320	50,070	20,250	86,700		
1980	922	786	956	219	86,220	66,530	19,690	81,100		
1981	983	859	1,022	247	100,250	78,080	22,170	70,000		27,600
1982	1,040	922	1,086	250	93,800	69,650	24,150	87,500		34,500
1983	1,130	977	1,156	277	81,390	57,580	23,810	88,600		34,900
1984	1,195	1,040	1,234	298	91,090	65,380	25,710	96,900		34,400
1985	1,326	1,103	1,298	292	94,250	68,540	25,710	86,910		29,440
1986	1,445	1,208	1,364	229	131,460	100,970	30,490	94,860		30,750
1987	1,577	1,313	1,429	173	145,010	109,640	35,370	98,510		38,760
Year ending 31 Dec.										
1986	1,514	1,283	1,411	190	137,070	104,720	32,350	98,765		37,484
1987	1,665	1,392	1,487	143	146,990	108,250	38,740	100,650		40,210
1988	1,796	1,472	1,552	113	138,900	93,590	45,310	97,760		43,336
1989	1,882	1,533	1,587	81	135,890	86,770	49,120	106,820		51,210
1990	1,974	1,626	1,657	52	148,840	95,030	53,810	124,375		54,790
1991	2,058	1,03	1,719	31	161,225	112,905	48,320	143,280		56,685
1992	2,145	1,804	1,833	46	191,635	137,255	54,380	193,870		65,400
1993	2,238	1,958	1,970	32	252,027	175,725	76,302	206,620		81,840
1994	2,294	2,138	2,149	34	287,458	192,994	94,644	237,403		106,259

Source: Bezeq, 1994.

^aFor year ending on indicated date.

^bThe propensity to own a telephone — the potential population demand for main telephone lines: total main lines plus outstanding orders plus installation orders in hand plus unpaid installation accounts.

Table A.2. Development of the Telecommunications System—Indicators (year-end data)

	Unit	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Telephone exchange complex												
Total exchanges		140	149	154	169	178	180	182	185	202	225	233
In permanent buildings	Number	181	189	209	239	247	254	260	268	297	288	300
Mobile caravans		147	155	169	184	196	207	216	223	240	212	206
Remote line modules		34	33	33	36	23	18	9	4	2	2	3
Exchange capacity	('000)	—	1	7	19	28	29	35	41	55	74	91
(numbers of which: digital		1,295	1,402	1,514	1,665	1,796	1,882	1,975	2,058	2,145	2,238	2,295
DDI capacity	%	6	12	16	24	32	37	43	52	58	71	79
Direct lines connected	('000)	240	348	433	494	558	622	696	800	910	1,040	(8)
of which: digital		1,086	1,180	1,283	1,392	1,472	1,534	1,626	1,703	1,804	1,958	2,138
Outstanding orders	%	5	9	15	22	28	34	44	53	61	74	81
New lines	('000)	251	191	131	103	74	50	26	12	22	18	14
Transfers		217	168	114	88	62	41	20	8	16	13	10
Installation orders in process	('000)	34	23	17	15	12	9	6	6	6	5	4
New lines		33	42	44	29	27	24	17	14	21	13	19
Transfers		24	31	31	20	19	16	11	10	15	9	13
Unpaid installation accounts	('000)	9	11	13	9	8	8	6	4	6	4	6
Total Demand—New lines		10	13	15	11	12	7	9	3	3	1	—
Transfers		251	212	160	119	93	64	40	22	34	22	23
Public phones		43	34	30	24	20	17	12	9	12	9	10
	Number	9,300	10,600	12,400	13,600	14,000	14,540	14,730	15,360	17,120	19,008	19,150

Cellular mobile telephones	Number	—	1,500	3,500	6,250	9,900	15,240	23,000	(4)	(4)
Telex lines	Number	4,900	5,330	6,425	6,300	5,690	5,190	4,410	3,650	3,007
Analog point-to-point data lines	Number	5,100	6,100	8,225	9,370	10,270	11,455	12,480	(4)	(4)
Digital point-to-point data lines	Number	—	—	600	1,800	2,590	3,300	3,450	(4)	(4)
ISIRANET (PSPDN) subscribers	Number	350	490	700	1,080	1,430	1,680	1,839	(4)	(4)
International telephone channels	Number	1,100	1,205	1,388	2,051	2,353	2,447	3,327	(4)	(4)
Telephone lines per 100 inhabitants	Rate	25.9	27.7	29.6	31.6	32.9	33.6	33.7	34.7	36.8
Public phones per 100,000 inhabitants	Rate	221	248	286	309	313	319	304	330	357
Telex lines per 100,000 inhabitants	Rate	117	125	137	146	141	125	87	70	57
Population	('000)	4,200	4,266	4,331	4,406	4,477	4,556	5,059	5,196	5,332
Households	('000)	1,090	1,107	1,131	1,149	1,166	1,189	1,291	1,355	1,404
Average number of persons per household	Rate	3.61	3.52	3.63	3.63	3.61	3.52	3.64	3.66	3.65
Percent of families: Owning a phone	Percent	72	77	81	85	88	90	91	92	93
Distribution of telephone lines by sector:										
Residential ^a	Percent	75	75	75	74	74	74	73	74	74
Business	Percent	19	19	19	20	20	20	21	20	20
Government & public institutions	Percent	6	6	6	6	6	6	6	6	6

Source: Bezeq, 1991, 1994.

^aIncluding residential/business.

Table A.3. Development of International Telephone Traffic

	84/85	85/86	86/87	1987	1988	1989	1990	1991	1992	1993	1994
Total paid minutes (millions)	122.5	138.8	170.0	207.2	240.8	283.0	320.2	387.6	^a	^a	^a
Outgoing	36.5	41.2	53.3	73.6	91.4	106.7	118.0	140.3	^a	^a	^a
Incoming	86.0	97.6	116.7	133.6	149.4	176.3	202.2	247.3	^a	^a	^a
Telephone voice channels (annual average)	987	1,085	1,255	1,415	1,752	2,115	2,400	3,060	^a	^a	^a
Paid minutes per voice channel ('000)	124	128	135	146	137	134	133	127	^a	^a	^a
Average number of paid minutes per main line	114	120	135	154	168	187	203	233	^a	^a	^a
Average number of paid minutes per capita	29	33	39	47	54	63	69	79	^a	^a	^a

Source: Bezeq, 1991.

^aSince 1992, certain official statistics are not published.

Table A.4. Bezeq's Total Annual Investment (million \$, adjusted to 1994)

	86/87	4-12/87	1988	1989	1990	1991	1992	1993	1994
Total Investment	433.3	316.1	350.1	377.7	475.8	465.9	543.3	517.7	531.4
Land and buildings	16.3	24.0	22.9	26.4	14.2	14.2	16.7	16.0	4.9
Switching and power equipment	234.1	151.8	147.3	197.8	207.3	234.5	267.4	222.3	218.7
Transmission ^a	140.0	104.6	149.1	179.2	118.5	96.5	94.1	106.3	96.8
Access network	—	—	—	—	37.5	54.2	83.4	91.2	131.8
Subscriber equipment and public phones	22.5	14.7	17.5	12.6	17.0	32.8	41.3	46.6	48.6
Management information systems and office equip ment	9.8	13.4	10.0	14.8	8.8	16.7	22.7	24.2	17.0
Vehicles	10.7	7.6	3.4	6.9	12.7	17.1	75.6	11.1	13.6

Source: Bezeq, 1994.

Table A.5. Bezeq's Financial Highlights (million \$, adjusted to 1994)

	85/86	86/87	4-12/87	1988	1989	1990	1991	1992	1993	1994
Income	1,043.9	1,221.2	993.5	1,390.1	1,428.3	1,546.2	1,667.4	1,767.0	1,898.4	1,999.8
of which: Telephones	94.3%	91.7%	95.3%	95.7%	96.0%	96.8%	96.9%	97.5%	96.7%	97.1%
Indices based on 85/86=100, adjusted to COL index	100	117	95	133	137	148	160	169	182	192
Expenses	866.9	974.6	846.3	1,165.3	1,191.6	1,231.5	1,344.1	1,425.6	1,524.7	1,628.6
Operating and general	502.4	567.3	500.2	666.4	701.7	700.7	794.1	863.7	902.4	1,039.3
Depreciation	292.7	330.0	279.1	405.1	392.4	421.0	427.5	437.7	479.0	489.8
Royalties	71.8	77.3	67.0	93.7	97.6	109.8	122.5	124.2	143.3	99.4
Operating income	177.1	246.6	147.2	224.8	236.7	314.7	323.3	341.4	373.7	371.3
Financing	75.6	159.6	94.9	200.9	182.5	176.4	181.0	156.4	143.8	84.4
Other expenses	—	—	—	—	—	11.2	—	37.1	45.2	119.9
Income taxes	69.1	48.0	19.7	13.8	31.0	62.0	63.5	60.4	77.6	70.8
Net income	32.3	39.1	32.6	10.0	23.2	65.0	78.7	87.5	107.2	96.3
Net return on equity capital	3.2%	3.1%	4.3%	1.0%	2.2%	6.0%	7.0%	7.5%	8.7%	7.6%
Income per employee ('000)	124	140	148	154	155	160	165	171	187	203
Telephone income per line (\$)	848	883	934	926	907	948	971	983	976	949
Operating expense per line (\$)	433	450	496	465	464	450	486	493	479	507
Net value of fixed assets per main line (\$)	2,603	2,443	2,332	2,169	2,077	1,949	1,882	1,834	1,760	1,632
Total investment	395.0	433.7	316.1	350.2	377.7	415.6	465.9	543.3	517.7	531.4
as % of income	37.8%	35.5%	31.8%	25.2%	26.4%	26.9%	27.9%	30.7%	27.3%	26.6%
as % of national investment	4.7%	4.2%	4.4%	3.5%	4.0%	3.7%	2.8%	3.0%	2.9%	4.6%
per capita (\$)	93	100	97	79	83	89	94	106	99	99
Average tariff for telephone services ^a	100	95	96	90	82	81	81	71	69	58

Source: Bezeq, 1994.

^aIndices based on 1984/85 equals 100 and adjusted to cost of living index.

Table A.6. Bezeq's Tariffs (yearly average, current \$)

Year	Installation Fee		Transfer Fee	Monthly Rental		Metering Unit (cents)	Token (cents)	International Calls (cents/minutes)			
	Business	Residential		Main Cities	Other Cities			Telephone		Telex	
					Villages	USA	Europe	USA	Europe		
1980/81	218	218	79	6.12	4.10	4.10	7.17	2.38	1.88	2.60	1.74
1981/82	256	205	56	4.40	2.97	2.97	5.50	2.47	1.95	1.77	1.19
1982/83	255	182	50	4.29	1.84	1.84	5.37	2.69	2.19	1.84	1.23
1983/84	195	140	49	3.59	2.30	2.30	4.67	2.51	2.01	1.84	1.25
1984/85	186	133	47	3.19	2.05	2.05	4.79	2.45	1.97	1.77	1.2
1985/86	205	148	52	3.50	2.25	2.25	5.28	2.81	2.26	2.03	1.39
1986/87	257	186	65	4.25	2.3	2.3	9.28	2.90	2.32	2.09	1.43
1986	238	172	60	3.98	2.56	2.56	7.64	2.92	2.34	2.10	1.44
1987	306	221	78	4.89	3.15	3.15	13.62	2.87	2.31	2.15	1.48
1988	350	252	89	5.47	3.55	3.55	16.15	2.90	2.27	2.28	1.56
1989	329	238	84	4.98	3.22	3.22	15.83	2.41	1.92	1.90	1.31
1990	377	272	96	5.68	3.68	3.68	18.59	2.30	1.90	1.85	1.27
1991	386	319	106	6.40	6.50	3.93	20.70	2.23	1.78	1.75	1.21
1992	251	251	102	4.98	5.19	3.37	20.27	^a	^a	^a	^a
1993	219	219	96	3.91	3.97	2.90	17.68	^a	^a	^a	^a
1994	199	199	63	5.51	5.51	4.61	16.61	^a	^a	^a	^a

Source: Bezeq, 1991, 1994.

^aSince 1992, certain official statistics are not published.

Table A.7. Selected Indicators Illustrating Quality of Telecommunications Services

	Unit	1987	1988	1989	1990	1991	1992	1993	1994
Telephony customers trouble reports and service restoration (daily average)									
Faults reported per 1,000 lines		2.96	2.91	2.58	2.40	2.28	2.10	1.54	1.5
Outstanding repairs per 1,000 lines		3.71	3.98	4.35	3.37	2.49	1.51	0.49	0.7
Percentage of repairs over 48 hours (yearly average)	%	21.75	25.22	22.47	17.57	12.65	7.12	0.84	"
Call completion rates									
Subscriber QOS (live traffic)									
Average	%	44.2	46.0	47.8	49.9	52.4	55.2	56.2	57.5
Intraexchange	%	50.5	52.4	54.2	55.6	58.1	60.6	60.3	61.1
Local	%	47.6	48.5	50.1	50.9	52.9	55.7	56.4	57.5
Local area	%	38.5	41.7	44.0	47.1	51.5	53.9	55.5	56.2
Long distance	%	35.9	38.3	39.9	42.4	46.0	49.6	51.0	53.5
International outgoing	%	28.5	32.0	33.0	32.0	39.0	38.4	40.9	55.7
International incoming	%	42.7	42.3	48.5	51.5	54.4	56.5	58.2	60.0
Call completion rates									
Network QOS (test traffic)									
Local	%	97.2	97.8	98.7	99.0	99.1	99.3	99.5	99.5
Local area	%	85.4	90.2	91.1	95.4	96.9	97.7	98.6	98.8
Long distance	%	80.7	87.5	89.9	93.6	96.5	97.4	98.5	98.5
Customer complaints per 1,000 lines		—	21.3	23.8	9.7	5.6	3.6	1.8	2.0

Source: Bezeq, 1994.

"Since 1994, certain official statistics are not published.

Table A.8. Selected Indicators Illustrating Development of the National Economy

	Unit	1987	1988	1989	1990	1991	1992	1993	1994
Population—annual average									
Permanent population	('000)	4,406	4,477	4,560	4,822	5,059	5,196	5,322	5,447
Households (incl. single persons)	('000)	1,149	1,166	1,189	1,228	1,291	1,355	1,404	1,450
Employed—annual average									
Employed	('000)	1,404	1,453	1,461	1,492	1,583	1,650	1,751	1,861
Unemployed as percent of civilian work force	%	6.1	6.4	8.9	9.6	10.6	11.2	10.0	7.8
National income and expenditure (1990 prices)									
Gross national product (GNP) indices (1990=100)	NIS M Indices	91,710	95,278	96,278	102,271	109,329	116,403	121,166	129,110
Gross domestic product (GDP) indices (1990=100)	NIS M Indices	94,753	97,796	98,846	104,787	111,262	118,692	122,736	131,023
Private consumption	NIS M	58,609	61,300	61,505	64,894	69,631	75,324	81,140	88,694
Public consumption	NIS M	33,420	32,620	29,990	31,457	32,762	32,819	34,668	35,246
Gross fixed capital formation indices (1990=100)	NIS M Indices	10,077	16,998	16,290	20,686	29,379	31,205	32,118	34,821
		83	82	79	100	142	151	155	168
GDP per capita									
New Israeli Sheqels (1990 prices)	NIS	21,505	21,844	21,677	21,731	21,992	22,843	23,062	24,054
Indices	Indices	99	100	99	100	101	105	106	111

Foreign trade												
Net imports	\$ M	11,455	12,287	13,030	15,107	16,691	18,564	20,245	23,444			
Net exports	\$ M	8,201	9,445	10,669	11,603	11,219	12,479	14,083	15,929			
Import surplus (trade deficit)	\$ M	3,254	1,842	2,361	3,504	5,472	6,085	6,162	7,515			
Exchange rates												
Year end	NIS/\$	1,539	1,685	1,963	2,048	2,283	2,764	2,986	3,018			
Annual average	NIS/\$	1,595	1,599	1,916	2,016	2,280	2,459	2,830	3,011			
Price indices—annual average												
Cost of living index	Base-1987	100	116	140	164	195	218	242	272			
Communications price indices												
annual average												
Telephone services	Base-1987	100	110	121	141	192	191	200	202			
Postal services	Base-1987	100	118	139	166	209	241	266	292			

Source: Bezeq, 1994.