CHAPTER 3: TRANSFORMATION OF THE MALAYSIAN TELECOMMUNICATIONS SECTOR

The rapid expansion of the Malaysian telecommunications sector is recognised as one of the country's strongest asset for industrial development. The sector experienced accelerated growth in the last two decades. During the same period privatization and liberalization has brought about significant structural transformation of the sector. This chapter examines these changes in the Malaysian telecommunications sector.

3.1 Physical Expansion of the Telecommunications Sector

Telecommunications sector has growth rapidly since the late 1980s. The number of telephone subscribers (residential and business telephone) increased from 107,000 in 1970 to 395,640 in 1980 to close to 1.6 million in 1990 and to more than 4.4 million in 1999 (see Table 3.1). The number of telephone subscribers grew by 1.1 per cent in 1999, with increase in both business (1.8 per cent) and residential (0.9 per cent) subscribers (Bank Negara Malaysia 1999).

The expansion of the telecommunications network was not confined only to the urban areas. Telecommunications network in rural areas has expanded as well (see Table 3.2). This was partly due to the government's efforts to provide rural telephone services in order to ensure a balanced distribution of telephone services within urban and rural area. The rural telephone line penetration rate was 2.2 per 100 people in 1990. Under the Seventh Malaysia Plan, the rural penetration rate increased from 5.5 telephone for every 100 rural resident in 1995 to 9.5 telephone per 100 persons in the year 2000; anyway, this

is still low as compared with national average of 16.6 and 24.7 per 100 people respectively. On the other hand, urban telephone penetration rate was higher at 16.6 per 100 person in 1990 to 24.8 in 1995 and further increase to 32.7 per 100 people by the year 2000.

Table 3.1: Malaysian Telecommunication Statistics, 1980-1999.

Year	Number of residential subscriber	Number of business subscriber	Total telephone subscriber	Number of telephone set: residential	Number of telephone set: business	Total number of telephone set	Number of ATUR subscriber
1980	228,171	167,469	395,640	244,207	354,737	598,944	3,878
1981	296,505	192,170	488,675	314,826	401,984	716,810	4,119
1982	367,157	218,230	585,387	387,190	449,390	836,580	5,866
1983	451,303	248,794	700,097	471,619	504,881	976,500	7,980
1984	563,428	285,701	849,129	586,546	564,314	1,150,860	9,774
1985	649,547	309,051	948,598	675,299	603,452	1,278,751	10,881
1986	723,579	319,248	1,042,827	754,543	626,414	1,380,957	11,383
1987	798,722	332,997	1,131,719	835,205	665,302	1,500,507	17,411
1988	884,138	363,549	1,247,687	929,338	716,360	1,645,698	27,302
1989	990,335	397,848	1,388,183	1,041,304	763,889	1,805,193	39,419
1990	1,135,954	449,790	1,585,744	1,201,151	821,430	2,022,581	54,616
1991	1,298,751	518,109	1,816,860	1,352,900	873,601	2,226,501	70,917
1992	1,504,480	587,098	2,091,578	1,599,949	951,008	2,550,957	83,118
1993	1,737,750	672,971	2,410,721	1,788,904	1,020,511	2,809,415	89,028
1994	2,078,103	785,652	2,863,755	2,136,125	1,129,113	3,265,238	98,730
1995	2,410,523	921,924	3,332,447	2,463,059	1,239,386	3,702,445	95,618
1996	2,695,882	1,014,989	3,710,871	2,755,563	1,397,662	4,153,225	72,126
1997	3,009,884	1,144,309	4,154,193	3,741,432	1,851,677	5,593,109	89,985
1998	3,184,560	1,139,145	4,323,705	3,943,240	1,859,808	5,803,048	71,070
1999	3,258,044	1,172,755	4,430,799	1,788,904	1,020,511	2,809,415	54,000

Source : Telekom Malaysia Berhad; Statistical's Handbook Malaysia, Department of Statistics (1982-1999) & Telekom Malaysia Berhad annual report 1999.

Table 3.2: Telephone Penetration Rate (per 100 person) in Malaysia, 1980-2000

Year	1980	1990	1995	2000
Fixed : Urban		16.6	24.8	32.7
Rural		2.2	5.5	9.5
National	2.9	9.3	16.6	24.7
Cellular National	-	-	3.5	16.5

Source : Mid Term Review of Sixth Malaysia Plan and Mid Term Review of Seventh Malaysia Plan.

The national telephone penetration rate increased more than three fold from 2.9 per 100 person in 1980 to 9.3 per 100 person in 1990 to 16.6 direct exchange line telephones per 100 person in 1995 and further increase to 24.7 per 100 person with the new plan investment technology.

The number of cellular phone subscribers rose from 4,630 in 1985 to 78,000 in 1990 to 700,000 in 1995; and estimated further increase of more than five fold about 3.7 million in 2000. Currently, there are about 2.5 million cellular phone users in Malaysia (New Straits Times; May 12, 2000). The penetration rate for cellular phone was 3.5 per 100 person in 1995 and it is estimated that this has increased five folds to 16.5 per 100 person in 2000 (see Table 3.2). However, this is still low compared to other countries such as 30% in Singapore and 50% in Hong Kong (Star Business, June 10, 2000).

Table 3.3: Malaysia Cellular Telephone Subscriber, 1990-2000

YEAR	1985	1990	1995	2000
Cellular phone subscriber ('000)	4.63	78	700	3,723

Source: Mid-term Review of Sixth, Seventh Malaysia Plan and Naidu and Lee (1994).

Cellular penetration rate is about 11% until the end of June 2000 and the growth in cellular is stronger than fixed lines, which is driven by competition and global trends. The target under the National Telecommunications Policy (NTP) is 50 telephones per 100 people by year 2020 (Information Department Malaysia, 1997).

Aside from the rise in telephone penetration, new technologies have also been introduced. These include fiber optics, wireless and broadband communication services including Asynchronous Transfer Mode (ATM), Synchronous Digital Hierarchy (SDH), High-speed Digital Subscriber Loop (HDSL), Asynchronous Digital Subscriber Loop (ADSL), PCN (Personal Communication Network), GSM[11], video conferencing, EDI and tele-banking and GPRS[12] (general packet radio services).

3.2 Privatization and Liberalization of the Malaysian Telecommunications Sector

In the period before 1987, telecommunications services were provided by JTM (Telecommunications Department Malaysia). Being a public entity, it was also the regulatory body for the industry and it reported to the Ministry of Energy, Posts and Telecommunications[13]. The main objective of JTM was to provide and regulate efficient inland and overseas telecommunications services. Unfortunately, it was not able to meet the demand for telecommunication services and terminal equipment[14] in the country. As a result, the number of applicants on the waiting list for telephone services increased.

[11] The first generation of mobile communications was analogue, which allow people to talk while on the move. The GSM and PCN are standards of the second generation (2G)
[12] GPRS is also known as 2Gplus. With 2Gplus, data can be transmitted at higher speed.
[13] The Ministry changed its name to the Ministry of Energy, Communications and Multimedia Malaysia in October 1998.
[14] Refers Kennedy (1990 and 1995) for further explanation.

The inefficiency of JTM in meeting the demand for telecommunications services in the country was one of the factors that triggered privatization of the Malaysian telecommunications sector. Privatization of the Malaysian telecommunications sector can be divided into two stages.

3.2.1 Privatization Stage I: Corporatization

In the first stage, the operations component of JTM was corporatized on January 1, 1987. Syarikat Telekom Malaysia Berhad (STMB) was established to take over JTM's operations. STMB was registered under *Companies Act 1965* with 100% state ownership and a share capital of RM500 million. It was also granted a monopoly in the provision of telecommunication network and basic services under a twenty-year license, with effect from January 1, 1987. What remained behind with JTM was its regulatory functions.

The corporatization of JTM's operations did not end the government's involvement in the sector. Aside from JTM assuming a purely regulatory role, the government continued to finance some privatized infrastructure investment with soft loans.

3.2.2 Privatization Stage II: Divestiture

The second stage of the privatization of the telecommunications sector began in 1990. The government divested some of its share in STMB via sale of equity through a public flotation. STMB was listed on Kuala Lumpur Stock Exchange (KLSE) main board on November 7, 1990. Subsequently, its name was changed to Telekom Malaysia Berhad (TMB) on June 6, 1991.

The government maintained control in the new entity via a "Golden Share" mechanism whereby it has veto power over major decisions of the privatized firm. This setup is similar to the New Zealand government's 'golden share' in the incumbent operator following privatization and liberalization of the telecommunications sector in 1987.

3.2.3 Rationale of Privatization in the Telecommunications Sector

The telecommunications sector was not the only infrastructure sector to be privatized since the early 1980s. It was part of a broader privatization program initiated by the government. As stated in Privatization Masterplan, privatization was adopted by the government to meet five main objectives in general. The objectives of privatization originally formulated are:

1. Relieve the financial and administration burden of government
2. Improve efficiency and productivity
3. Facilitate economic growth
4. Reduce the size and presence of the public sector in the economy and
5. Help meet the national economy policy targets.

The telecommunications sector was privatized for several reasons. Privatization, in general, was seen as a way to relieve the government's financial burdens. In addition, private provision of infrastructure services was expected to bring about improvement in the efficiency in service delivery. It was also viewed as a mean to obtain technical and managerial expertise and as a tool for restructuring substantial investment. Malaysia lacks capital as well as skilled manpower to meet the demands for telecommunications services.

To increase access to data and voice communications, it was necessary to eliminate existing bottlenecks, something JTM was not able to accomplish.

In Malaysia, the inefficiencies and poor profitability margins of the telecom system, the limited government fund, the failure of government to restructure JTM, an increasing inability to compete in the information industries and the social redistributing wealth among the Bumiputera provide sufficient reasons for privatization. The participation of the private sector in telecommunications is necessary to expedite telecommunication development to meet the growing unmitigated demand of terminal equipment supply problem[15] as privatization will help relieve the administrative and financial burden of the government and contribute towards meeting the objectives of New Economic Policy (NEP)[16]. Anyway, the decision regarding the services to be licensed to TMB which is decided by the Ministry is not always favour the company. For instance, Uniphone was granted a 15-year (expiring in 1988) monopoly license to supply and maintain public payphones in urban services, leaving TMB with non-economical rural areas. Thus, this unfair condition pushed towards the support of privatization in TMB.

3.2.4 Liberalization of the Telecommunications Sector

The removal of restrictions on competition is often referred to as liberalization (Armstrong, Cowan and Vickers, 1994). World Bank (1996) defines economic liberalization as the loosening or elimination of government restrictions on domestic transactions, prices and markets; on external transactions and the free exchange of

[15] JTM began suffer this shortage problem since the late 1970s. Refers to Kennedy (1990) for more detail. p.197

[16] This is supported by Toh (1990)

domestic currency for foreign and vice versa; or on free entry of firms into domestic markets.

Liberalization was seen as a complementary strategy to privatization in Malaysia. In the telecommunications sector, it led to rapid introduction of competition, firstly in customer premises equipment business, and later in the emergence of new network suppliers. An open and competitive environment was seen as a pre-condition for welfare improvements via greater choice and flexibility on the part of consumers.

The telecommunications sector was gradually liberalized by allowing more telecommunications companies of differing technologies to operate and compete in different markets. More licenses were given in cellular phone services, international gateway and subsequently fixed line networks. Hence, TMB's monopoly power was gradually eroded.

Liberalization brought about different problems. For example, there were too many players in the game, especially in the cellular market. Therefore, telecommunications companies might suffer from duplication of infrastructure and over capacity in the market. In addition, not all of the operators competed on equal footing in the market place particularly before an equal access policy was implemented in the early 1999.

3.3 Changes in Market Structure

The market structure of the telecommunications industry is never static because of technological changes. Furthermore, the implementations of privatization and liberalization policies in the telecommunications sector have direct impacts on the

industry's market structure. In fact, the gains from these policies are premised upon changes in market structure i.e. welfare gains derived within a more competitive market.

The telecommunications services that have undergone significant changes in market structure, regulation and performance in recent years including domestic long-distance fixed telephony (trunk), international long-distance fixed telephony (international), and cellular mobile telephony (mobile). The degree of competition varies in different segments of the telecommunications sector. The big five major telecommunications companies in Malaysia compete in most of these markets (Table 3.4). Currently, Malaysia has six fixed line services, five international licensed telecommunications operators and six licensed mobile operators.

Table 3.4: Malaysia - Major Telecommunications Companies and their services provided

	Telekom	Celcom	Maxis	Time	DiGi
Fixed network	Yes	Yes	Yes	Yes	Yes
International gateway	Yes	Yes	Yes	Yes	Yes
Internet service provider (ISP)	Yes	Yes	Yes	Yes	No
Cellular	Yes	Yes	Yes	Yes	Yes
Payphone	Yes	No	No	Yes	No

3.3.1 Fixed Network Service

Prior to the privatization and liberalization of the telecommunications sector, the incumbent firm TMB was the monopoly firm in fixed network service. At present, there are five other firms. More than 98% of fixed network service in Malaysia is provided by TMB (The Star, 6 June 2000) while the rest is shared between Time Telekom dotCom,

Celcom, Maxis Communications and DiGi Telecom[17] and Prismanet (formerly Syarikat Telekom Wireless). TIME Telekom is the second fixed line operator in the country after TMB.

However the portion contribution to the revenue from incumbent fixed line business has declined due to the implementation of equal access in January 2000, competition among fixed line operators, the growing trend towards the use of cellular business and technological developments in the internet. There has affected the drop in national and international calls.

3.3.2 Cellular Telephony

Cellular telephony in Malaysia was first introduced by TMB in 1985 with ATUR 450. Four years later, Celcom introduced ETACS Art 900 system in 1989. These two systems are operated based on analogue technology. This is followed by Mobikom Sdn.Bhd was granted the first license to operate a digital service with brand name Mobifon 800 dual-mode system in 1994. Then came the explosion of digital cellular the following year. By the year 1995, the country has several new cellular telephone systems in operation, namely Mutiara Telecommunications Sdn.Bhd, using the service name DiGi 1800, MRCB Telecommunications Sdn.Bhd (Emartel), Sapura Digital Sdn.Bhd (Adam) and Binariang Sdn.Bhd (Maxis Mobile). In addition, Celcom also went digital with its Celcom GSM digital service. Mutiara Telecom was the first cellular operator that provided GSM roaming service in Malaysia. Then, MRCB sold Emartel to TMB for RM640 million in August 1996. Emartel under TMB was subsequently re-named as TMTouch. Besides, it

[17] Formerly DiGi Swisscom Bhd. Switzerland's Swisscom, pulled out of DiGi Swisscom Bhd, now known as DiGi.com.Bhd.

also bought over another cellular network, Mobikom Sdn.Bhd since May 1998 for RM182.7 million. Thus, TMB has three operating cellular networks - ATUR 450, TM Touch and Mobifon 800. Meanwhile Time Engineering Bhd bought over Adam from Sapura Digital in 1997 for RM750 million of 75% stake.

The breakdown of cellular subscribers is as follows:

TMB currently has 524,000 cellular subscribers which comprise 314,000 TM Touch subscribers, 150,000 Mobifon subscribers and 60,000 ATUR 450 subscribers (The STAR, June 6, 2000). TM Touch had a near 25% market share of mobile service business with combined post and pre-paid subscribers. (The Star, July 7 2000).

Mobikom registered a customer base of 141,434 in 1999, a 3% decrease from the 1998 customer base. Whereas TMTouch's customer base has increased from 138,000 subscribers in 1998 to more than 233,000 customers by the end of 1999.

Maxis is the fastest growing network in the industry. It is the largest digital network with 800,000 subscribers. It controls about 30% share of the mobile phone market (The STAR, June 10, 2000).

Celcom is the country largest cellular phone operator which is wholly owned by Technology Resources Industry (TRI) Berhad. Celcom, with its ETACS ART 900 and Celcom GSM has the lion share of the market. With the migration from Art 900 analogue system to GSM digital system, this subscribers figure declined sharply. Celcom plans to terminate its ART 900 service by the year 2005. Celcom now has over 30% share of mobile service business. (NST July7, 2000). Celcom (M) Sdn.Bhd's customers enjoying access to the internet in addition to the mobile communications and fixed lines services with the brand name of Celcom.net.

Meanwhile, DiGi.com Bhd (previously DiGi Swisscom Bhd) has its own niche market in prepaid package. DiGi currently commands 23% of total mobile services market with around 700,000 subscribers (Star-In Tech, July 18, 2000). It was the first to launch low-usage prepaid mobile phone service. This prepaid service was the primary driver which made DiGi the third largest cellular player after Celcom and Maxis. DiGi currently the market leader in the prepaid segment with 60% market share (Star Business, July 15, 2000).

Time dotCom has a customer base of 820,000 subscribers of which 400,000 are from mobile services (The Star, August 4 2000). TIME Engineering Bhd is the Malaysia's biggest fiber-optic network. Its voice over internet protocol (VOIP) services is using 100% fiber-optic network and manage to market it well.

The cellular sector has shrunk from eight to five players. There are:

1. Celcom Malaysia Sdn.Bhd {two network - ART 900 (Automatic radio telephone); an ETACS network and Celcom GSM (Global System mobile communication network)},
2. Maxis Communications (Maxis Mobile, GSM network).
3. TMB {three networks - ATUR 450 (Nordic Mobile Telephone network-011), Mobifon 018 (Advance Mobile Phone System, AMPS), TMTouch-013 (Personal Communications Network, PCN)},
4. TIME Telekom (Adam, PCN network) and
5. DiGi Telecom (DiGi 1800, PCN network) (refer Table 3.5)

Table 3.5: Current Cellular Phone operators (in operation), service name, types of service, year started operation and prefix - year 2000

Operator	Service name	Types of service	Year started operation	prefix
Cellular Communications Network Sdn.Bhd (Celcom)	ART 900 Celcom GSM	Analogue Digital	August 1989 September 1995	010 019
Maxis Sdn.Bhd[18]	Maxis Mobile	Digital	August 1995	012
DiGi Telecommunications Sdn.Bhd[19]	DiGi 1800	Digital	May 1995	016
Time Wireless Sdn.Bhd	Adam	Digital	August 1995	017
Telekom Cellular Sdn.Bhd	TM Touch ATUR 450	Digital Analogue	June 1995 January 1985	013 011
Mobikom Sdn.Bhd	Mobifon 800	Dual mode	June 1994	018

Source: Adopted from Malaysian Business 16 December 1997 and 16 December 1996.

Telecommunications sector is one of the most competitive industry in Malaysia. There are too many licenses given in this small market. Therefore, those who has greater market share, more advance technology infrastructure and stronger financial strength would determine its ability to compete and win in this competitive market. Due to technological changes, industry observers expect the operational costs for cellular services will become lower and operators will provide cheaper services as well. This will further boost the demand for cellular lines.

[18] Previously was Binariang Communication Sdn.Bhd
[19] Previously was Mutiara Telecommunications Sdn.Bhd

Table 3.6: Cellular Services Subscribers in Malaysia, Year 1990-1997

	ATUR 450	ETACs ART 900	Celcom GSM[20]	TM Touch	AMPs Mobifon 800	Adam	Maxis GSM	PCN[21]
1990	54,616	23,315	0	0	0	0	0	0
1991	70,917	60,761	0	0	0	0	0	0
1992	83,118	123,330	0	0	0	0	0	0
1993	89,028	251,046	0	0	0	0	0	0
1994	96,730	442,890	0	0	32,100	0	0	0
1995	96,345	561,314	25,820	2,513	149,580	13,411	13,411	39,729
1996	72,988	842,000	86,000	16,991	191,271	65,899	151,036	170,262
1997	89,985	1,004,000	643,721	93,474	288,847	165,157	343,821	434,153
1998	71,010	335,000	549,000	138,000	145,677	145,000	489,000	NA
1999	54,000	255,000	799,000	233,000	141,434	250,000	750,000	NA

Source: Statistics Telecommunications Industry Malaysia 1997 & Telekom Malaysia Berhad annual report 1999, Social Statistics Bulletin Malaysia 1999 and Datafile of Asia-Pacific Telecom Telecommunications (2000).
* NA – not available

From the data below, it is estimated that total cellular market in the region is more than three million subscribers as at year ended 1999. Celcom (TRI) has the lion's share of the market with 1,054,000 subscribers which translates to 34.8% and Maxis is closing in with 750,000 subscribers (24.7%).

[20] The benefits of GSM are two-folds. First, it allows users to roam between GSM networks in different countries. Second, it allows the creation of a large single market for mobile telephone networks. PCN operates at a higher frequency and has a bigger bandwidth to accommodate larger capacity than the GSM.
[21] Mutiara was the first licensee to launch its DiGi 1800 service in May 1995. It has proved to be the most successful PCN operator in terms of subscriber numbers. Malaysia Resources Corporation Bhd (MRCB) commenced the service in June 1995 and sold out to TMB in April 1996. The third PCN licensee, Sapura Digital Sdn.Bhd launched ADAM PCN in August 1995.

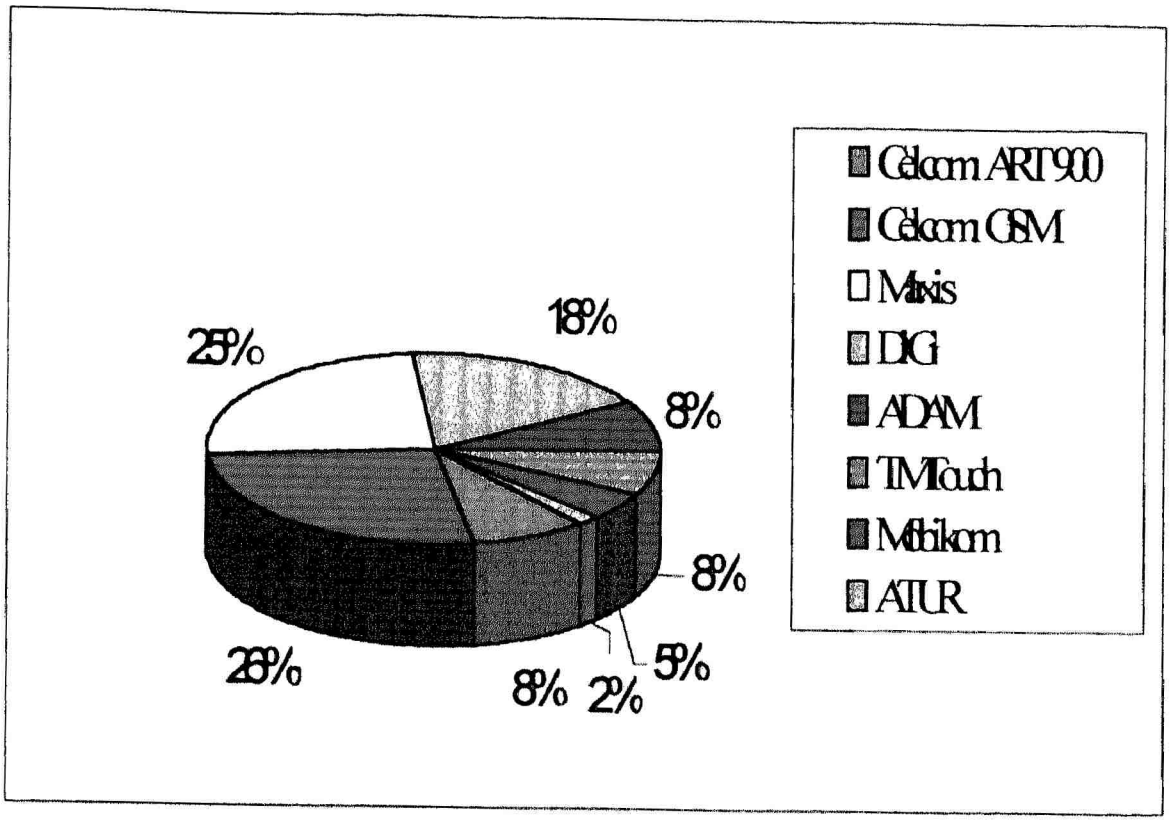

Figure 3.1 Market share of cellular phone from different telecommunications companies as at December 1999.

Number of subscribers as at December 1999

Telecommunications companies	Subscribers ('000)	Market share (%)
Celcom: ART 900	255	8.4
: GSM	799	26.4
Maxis	750	24.7
DiGi	550	18.1
ADAM	250	8.3
TMTouch	233	7.7
Mobikom	142	4.7
ATUR	54	1.8
TOTAL	3033	100

Source: Datafile of Asia-Pacific Telecommunications (2000)

Figure 3.2 Total number of cellular service subscribers.

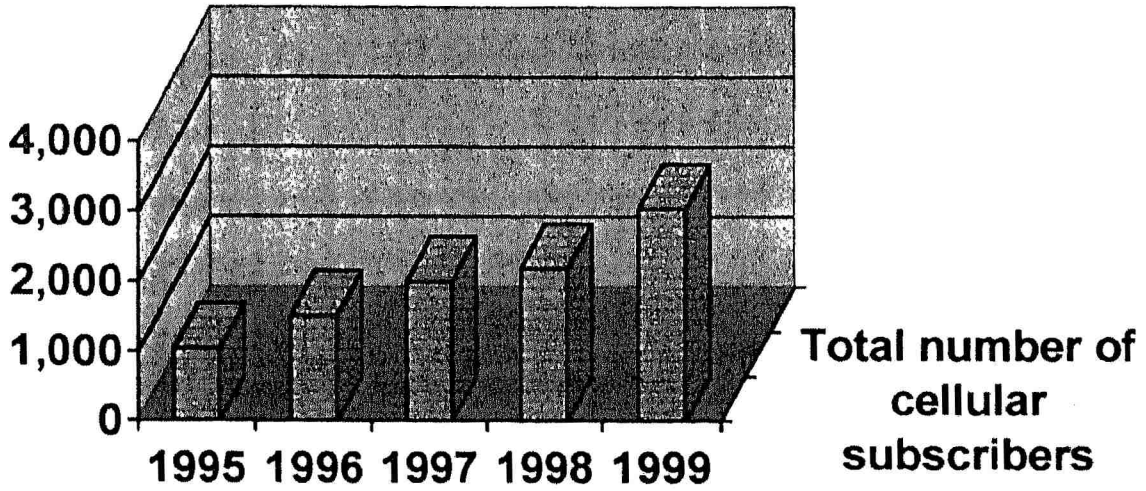

Figure 3.2 Total number of cellular service subscribers

Year	Total number of subscribers
1995	1,043
1996	1,514
1997	1,995
1998	2,184
1999	3,034

Source: Datafile of Asia-Pacific Telecommunications (2000)

3.3.3 Public Payphone

In the public payphone market, TMB is recognized as the biggest payphone operator in Malaysia. Although it is a business orientation entity, it has provided services in rural located communities. The urban payphone market is an oligopolistic market with three firms – TMB, Uniphone Telecommunication Berhad (a subsidiary of Sapura Holdings, a private telecommunication equipment manufacturer) and Citiphone. The rural payphone has also increased rapidly from 8,000 units in 1990 to 21,000 units in 1995 and it is estimated to 35,000 units in 2000 (Table 3.4).

Table 3.7: Public Payphones Service in Malaysia, 1990-2000

Year	1990	1995	2000
Public Payphone: ('000)			
Urban	17	55	279
Rural	8	21	35
Total Installed	25	76	314

Source : Mid Term Review of Seventh Malaysia Plan and Mid Term Review of Sixth Malaysia Plan, The Star May 29, 2000.

Table 3.8: Number of Public Payphones Installed, 1990-1997

Operator	1990	1991	1992	1993	1994	1995	1996	1997
TMB	6,798	8,658	11,268	15,305	23,892	38,182	60,288	89,320
Uniphone	19,515	23,149	28,636	35,956	46,948	62,182	66,819	69,757
Citifon	-	-	-	-	-	2,500	8,784	11,531
Total	26,313	31,807	39,904	51,261	70,840	102,864	135,891	170,608

Source : Statistics Telecommunications Industry Malaysia 1997

Installation of public payphone increased by 25.5% since 1996. New entrant, Citifon captured 6.76 percent of the total payphone in 1997 since its introduction in 1995.

TMB remained as the operator with the largest number of payphone installed, followed by Time Reach Sdn.Bhd (Uniphone). During the year 1999, Citifon was taken over by TMB's payphone business, this has increased the market share in payphone business area. This sector is not competitive. There are only two providers since the merging of Citifon into TMB. Not many investors are interested in this sector because of the high vandalism cost and the cost of installing telephone line in remote areas (where cost are higher than in rural areas. At present, there are 30,000 payphones and 60,000 card-cum-payphones in the country (The Star, May 29, 2000).

3.3.4 Paging Services

Radio paging service is one of the earliest types of mobile telecommunications services in Malaysia. Pager was first introduced by Kilatcom Paging Sdn.Bhd about 25 years ago. With the emergence of affordable cellular phones, its popularity has declined. As show in Table 3.9, the number of paging service subscribers declined from 149,268 in 1995 to 138,860 in 1998. There is not much competition in this sector. Even though the pager penetration rate is low nowadays, the service providers are working on value added services. For example, EasyCall Malaysia Sdn.Bhd has launched a service that enable internet users to page its pager subscribers by accessing EasyCall web site.

Table 3.9: Radio Paging subscriber, 1991-1998

Subscriber	1991	1992	1993	1994	1995	1996	1997	1998
Radio Paging	62,000	80,000	109,000	128,818	149,268	133,442	138,856	138,860

Source : Statistics Telecommunications Industry Malaysia 1997

3.3.5 Internet Provision

Currently, there are six licensed internet service provider (ISPs) in Malaysia. However, there are only two leading ISPs in Malaysia - Mimos and TMB. TMB offers TMnet services since operation in 1996. Whereas Mimos operating under the name Jaring. But Jaring using TMB's network; By the end of 1997, TMnet's subscribers' market share was 51%. TMnet showed encouraging growth rate of 47% to 405,330 customers in 1999, from the 272,000 in 1998, Currently, TMnet has 60% to 70% of the local market. (The Star, March 1, 2000).

Table 3.10: Internet Users in Malaysia, 1996-1999

Internet Service Providers (ISPs)	1994	1995	1996	1997	1998	1999
Telekom Malaysia Berhad (TMnet)	-	-	13,769	105,000	272,000	405,330
MIMOS Berhad (Jaring)	810	14,360	50,176	100,103	275,000	NA
Total	810	14,360	63,945	205,103	455,000	-

Source: Statistics Telecommunications Industry Malaysia, 1997; Economic Annual Report- Socio Economic Statistic (various issues), Economic Planning Unit, Malaysian Quality Of Life 1999.
NA: Not available

Other ISP provider is Maxis. It started offering its internet access in February 2000. Meanwhile, Celcom just started their internet provision since 23rd of June 2000 and most recently Time dotCom has started providing internet access, Time Net in October 2000. DiGi Telecommunications is now the only player that has yet to offer internet access to consumers.

In comparison, a TMnet user pays 1.5 cent a minute for telephone line charges, 1 cent per minute access charges and RM24 subscription fees per annum i.e. RM2 per month. If one only surfs for 20 hours, his bill is RM32 per month. While Maxis Net has

waived registration and access fees, phone charges are 3 cent per minute, which amounts to RM36 per month. Therefore, the Maxis Net charges are actually more expensive. The table below shows that Maxis Net customers pay significantly higher charges compared with Jaring and TMnet users. The savings are only marginal due to per minute call charges. Hence, Maxis Net does not take off well due to stiff competition from both well established ISPs although Maxis is issuing half-sen per minutes rebates to its existing subscriber of Maxis mobile, Connections, Hotlink and Smart Access Service. This rate is on par with TMnet and Jaring subscribers' payment. The situation may even competitive if government approves to revert the existing time-based tariff to flat rate local call because ISPs might offer flat monthly rates for unlimited internet access as what is implemented in US.

Table 3.11: Comparison of charges among TMnet, Jaring and Maxis Net.

Hours of usage	TMnet*	Jaring**	Maxis Net @3.0 sen/min
10 hours	17.00	16.67	18.00
20 hours	32.00	31.67	36.00
40 hours	62.00	61.67	72.00
60 hours	92.00	91.67	108.00
80 hours	122.00	121.67	144.00

Source: The Star: In-Tech March 14, 2000, p.6

* TMnet charges include RM24 annual fee
** Jaring charges include RM20 annual fee

3.3.6 Telecommunications Vendors

The telecommunications equipment sector in Malaysia consists mostly of foreign vendors. Companies such as Ericsson, Siemens, Alcatel, NEC and Lucent are considered to be the primary suppliers for switching and transmission equipment including

installation. However, many others have caught up recently and the incumbent vendors are getting smaller pieces of cake. For radio base stations, the vendors are Motorola and Nokia. Handset suppliers include Nokia, Motorola, Ericsson, NEC, Alcatel, Siemens, Samsung and Philips. This sector is important as vendor could influence the subscribers in choosing different telecommunications companies.

3.4 Liberalization and Foreign Participation

The liberalization of the telecommunications sector did not involve allowing free-entry of foreign firms into the sector. Instead, foreign telecommunications firms participate in the sector via equity shareholding in local telecommunications firms. The participation of foreign players is something the government wants to encourage in order to ensure local players are able to compete in a competitive environment.

Foreign ownership in local telecommunications companies must comply with limits that are imposed by the government. Examples include BT and Deutsche Telecom AG. In 1998, Maxis Communications Bhd[22] announced its partnership with BT. At the end of February 1998, the government increased the limit on foreign equity in local telecommunication companies from 30% to 49%.

BT currently holds a 33.3% share for RM1.8billion in Maxis and the other shareholders are MediaOne International of United States (12.6%); a partner in the satellite operations. In 1996 Deutsche Telekom paid RM1.4 billion for 21% of Celcom. Swisscom AG of Switzerland pulled out its equity of RM686 million for a 30% stake of DiGi and sold to Telenor Inti AG, Norway Telecom in late 1999 for RM787.5million (Malaysian Business, February 16 and March 1, 2000). Other investors in DiGi include

Japan's Softbank Investment (International) Holdings Ltd, with 3% in stake. Tie-ups with strategic partners have proved to work well – for example between Maxis and British Telecom and; between DiGi and Telenor. These alliances have benefited local telecommunications companies in terms of management expertise but not so much in terms of technology transfer (Malaysian Business, March 1, 2000).

Timedot Com Bhd, Time Engineering subsidiary signed the first Service Partner Agreements with a foreign company, US-based Orblynx Inc, that will provide internet content technology, via a satellite transmission path. Thus, this will brought about bandwidth savings and faster surfing speeds for internet users.

Other alliances have not worked out. For instance, Nippon Telegraph & Telephone (NTT) failed to acquire a stake in TMB which was said to be interested in buying 10% to 15% stake in TMB from Khazanah Nasional Bhd[23]. However, Khazanah Nasional Bhd has terminated talks with NTT Communication Corp and its mobile subsidiary DoCoMo Inc on July, 2000 because of significant disagreement over management issues.

Table 3.12: Malaysia – Telecommunications Companies and their Foreign Partners

LOCAL	FOREIGN	% OF EQUITY	YEAR PURCHASED	PRICE PAID
Maxis	British Telecom Media One	33.3 12.6	1998 1995	RM1.8bil US$230mil
Celcom	Deutsche Telecom	20.8	1996	RM1.4bil
DiGi	Telenor Inti AG Softbank	30 3	1999 2000	RM787.5mil Via share swap
Time Engineering	US-based Orblynx Inc	N.A	2000	N.A
TMB	Nil	Nil	Nil	Nil

Source : adopted from Star Business July 25, 2000, p1 and Star Business April 10, 2000, p.3

[22] Formerly was called Binariang.

3.5 Gains From Privatization and Liberalization

Corporatization in 1987 and subsequent privatization in 1990 has turned the telecommunications sector into the largest market capitalization in KLSE (Malaysian Business, December 16, 1996). Another perceived gain from privatization in the telecommunications sector is improvement in productivity and efficiency of the telecommunications service providers as well as the quality of services. One way to examine the productivity and efficiency issue is to look at TMB's performance before and after privatization.

3.5.1 Productivity and Efficiency Gains

Since TMB was privatized in year 1990, improvements were made in the provision of services and distributions in terms of administrative flexibility. These including better billing system (whereby it has reduced errors and complaints), new marketing strategy to increase earnings and improve the quality of services such as upgrading network to enhance capacity application for telephone installations and the speed of attending breakdowns. Table 3.13 has showed that each indicator has improved productivity and efficiency after privatization.

[23] Khazanah Nasional Bhd is the Telekom major share holder with 38.8% stake.

Table 3.13: Efficiency and Productivity Indicators of Telekom Malaysia Berhad

Indicator	Before privatization	After privatization (1997)
Telekom Malaysia Berhad[24]		
Return on assets (%)	4.0	7.6
Revenue per subscriber (RM)	1,227	1,609
Production per employee (RM)	34,372	219,641
Direct exchange lines per employee	36	154
Response to complaint within 24 hours (%)	80	91.5

Source: Mid-term Review of Seventh Malaysia Plan.

The performance of TMB can be explained by intense competition in telecommunications sector. After privatization, TMB financial performance has also improved markedly. During the first year of privatization, 1987, STM was gloomy. The company achieved a pre-tax profit of RM4.91 million. The following year, by contrast, it made RM180.41 million pre-tax profit, a 36-fold increase over 1987 profits. It rose further until the year 1998. However, it has registered a 47% drop in pre-tax profit to RM884.2 million for its financial year ended Dec 31, 1999, from RM1,668.9 million the year before. Operating revenue also marginally lower at RM 7.05 billion compared with the year before. This is largely due to the economy slowdown in the first half of 1999 which affected new subscriber growth.

Equal access was one of the factors. TMB losses more than 200,000 customers during the year because of equal access. It is expected the growth of the fixed line business at 400,000 line in year 2000 given the increasing number of new homes and residences in an improving economy. At the same time, long term debt to equity ratio improved from a high 2.3 in 1987 to 0.3 in 1996. By the way, the labour force increased annually since 1980s until today (Table 3.15).

Table 3.14: Telekom Malaysia Berhad operation revenue, operating revenue growth rate, profit before tax and debt equity ratio, Year 1987 -1999.

	Operating revenue (RM Million)	Operating revenue Growth rate over previous year (%)	Profit before tax (RM Million)	Debt/equity ratio
1987	1,644.2	-	4.91	2.30
1988	1,882.0	14.50	180.41	2.00
1989	2,141.0	13.80	365.78	1.50
1990	2,574.3	20.20	563.70	0.30
1991	3,004.6	16.70	1,079.60	0.20
1992	3,413.8	13.70	1,275.70	0.20
1993	3,930.9	15.14	1,527.20	0.10
1994	4,491.7	14.27	1,676.30	0.23
1995	5,252.8	16.94	1,933.70	0.32
1996	6,416.3	22.15	2,388.10	0.30
1997	7,165.7	11.68	2,376.40	0.69
1998	7,392.4	11.37	1,668.90	0.66
1999	7,049.6	-4.64	884.20	0.60

Source : Annual Report of Telekom Malaysia Berhad 1999 and Telecoms Industry Directory Malaysia 1994; Annual Companies Handbook (Various issues) and Corporate Handbook KLSE Mainboard- the definite guide to listed companies Feb 2000.

Table 3.15: Malaysia - Employment in transport, storage and communication sector ('000)

	1980	1985	1990	1995	1996	1997	1998	1999
Transport, storage & communication	199.1	244.3	302.0	399.2	410.0	434.0	438.4	442.0

Source: Economic Planning Unit, Department of Statistics, Bank Negara Malaysia & Mid-Term Review of Five-Year Plan (various issues)

[24] Privatized in 1990.

3.5.2 Improvements in Quality

The quality of telecommunications services can be measured by a number of indicators. These include:

- the number of faults reported per line (the so-called 'call failure rate') is proxy for network reliability [Refer Table 3.16 for data].
- the number of complaints per 1000 lines [Refer Table 3.16 for data].
- network congestion - the negative externalities that arise from network congestion prevent some users from making calls. Network congestion is caused by insufficient plant capacity. Through 100% digitalization of network currently and upgrading equipment, the quality and capacity of service improved. Line congestion decreased from 15% in 1990 to 3% in 1995.
- the rate response of the operator to assisted calls - operator response to assistance calls (within 20 seconds) have improved from 85% in 1987 to 99% in 1989 (Syed Hussein Mohamad, 1994).
- the number of customer complaints - In 1987, a total of 1.4 million customer complaints or 1.2 per line per annum was received. Two years later in 1989, the number of complaints decreased to 1.2 million or 0.8 per line per annum (Wellenius and Stern, 1989).
- the length of waiting list for telephone facilities - the supply of telephone facilities were far lag behind the demand within 1970 and 1980. The waiting list increased from 12% of total users in 1970 to about 23% in 1980. However, the number of

people waiting for telephones dropped by 46% from 81,780 in 1990 to 44,383 in 1995.

Table 3.16: Quality of Telecommunications Services in Telekom Malaysia Berhad.

Year	Total faults reports per line	Total complaint per 1000 lines
1989	0.79	30.9
1990	0.76	19.9
1991	0.78	14.7
1992	0.78	8.80
1993	0.34	7.20
1994	0.63	7.10
1995	0.60	7.00
1996	0.46	6.80
1997	0.39	7.10
1998	0.38	13.20
1999	0.46	10.20

Source: Telecoms Industry Directory Malaysia 1994, 1996 & Telekom Malaysia Berhad annual report 1999.

In sum, the quality of Malaysian telecommunication services has improved after privatization. Telecommunications companies have committed to invest between RM62.5 billion to RM125 billion up to year 2020. Research and Development (R&D) is extremely important for the development and modernization of the industry. Hence, it is expected to increase the network capacity and serve better quality of services. In addition, government has target to increase the penetration rate to 50 telephones to every 100 population by the year 2020.