

TELECOMMUNICATIONS REFORMS IN MALAYSIA

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1. INTRODUCTION

The telecommunications sector in Malaysia has undergone significant physical and structural transformation in the past fifteen years. Between 1985 and 2000, the country's telephone penetration rate rose by 540 per cent. Equally importantly, privatization and liberalization of the sector in the 1980s ushered in an era of regulatory reforms and competition in the sector. The market structure as well as the regulatory framework and institutions for the telecommunications sector continue to evolve. As other countries that have privatized their telecommunications are learning now, privatization *per se* is easy. The real challenge lies in what to do after that – putting in place adequate regulatory framework and institutions that will ensure industry growth as well as protect consumer welfare. The on-going micro-regulatory reforms in the sector seek to fine-tune the regulatory mechanisms in the sector.

This paper reviews the recent history and development of the telecommunications sector in Malaysia. Section 2 provides a brief historical account of the sector and the current structure of the sector. This is followed by a discussion on regulatory reforms in

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Section 3. Section 4 examines the impact of reforms in the telecommunications sector. Section 5 concludes by discussing the future policy agenda for the sector.

2. EVOLUTION OF INDUSTRY STRUCTURE

2.1. Physical Expansion

The infrastructure sector plays a key role in Malaysia's economic growth and development. The sector's share of development expenditure in the various five-years plans implemented since 1966 has fallen in the range between 18 per cent to as high as 34 per cent (Lee, 2000). This emphasis on infrastructure development notwithstanding, the expenditures appear to be targeted mainly at the transport and power sectors. As a result, telecommunications indicators - such as the fixed line penetration ratio - remained relatively low particularly before 1980 (**Table 1**). In 1970, the fixed line penetration ratio was merely 1.3 per 100 population. This figure increased to 2.9 per 100 population in 1980 and 8.7 per 100 population in 1990. Significant gains in the fixed line penetration were made after telecommunications reforms were undertaken beginning 1987. By 1995 and 2000, the fixed line penetration ratio had risen to 16.6 per 100 population and 21.0 per 100 population respectively (note: the direct exchange line penetration rate is around 20 per 100 population). Concomitantly, cellular phone subscriptions have grown very rapidly since the early 1990s. The total number of cellular phone subscribers stood close to 84,557. By the year 2000, this had increased to 5.1 million subscribers.

Despite the impressive achievement in telephone penetration (for both fixed line and cellular telephones), access to telecommunications services remains uneven. The

penetration rates in some of the poorer states such as Kelantan, Sabah and Sarawak are significantly below the national average (**Table 2**).

2.2. Liberalization and Privatization

Reforms in infrastructure sector in Malaysia began in the early 1980s. The experience of twin deficits and mounting external debt during this period convinced the Malaysian government to embark on a strategy of promoting private sector-led growth and development. The government considered privatization to be a way to relieve their administrative and financial burdens and at the same time improve the efficiency in service delivery. Privatization was also considered to be an important avenue to address the issue of economic imbalance between the different races in the country. More specifically, the government sought to increase the participation of the indigenous community (or “Bumiputeras”) in mainstream economic activities. Thus, reforms that were carried out in Malaysia had both efficiency and equity considerations. It is difficult to ascertain to the extent of conflict between these two objectives. Some critics tend to think that distributive considerations were given more emphasis compared to efficiency objectives.¹

In the telecommunications sector, reforms began in 1983 when the government allowed the private sector to complement JTM in the supply of terminal equipment such as telephones and teleprinters. This initial effort to liberalize the telecommunications sector was driven by a shortage of terminal equipment as well as the private sector’s ability to convince the government they could remedy the problem. Several locally-owned as well

as foreign companies took advantage of the new market environment. This set the stage for further liberalization in other telecommunications markets such as VANS (1984), radio paging (1985), and mobile cellular (1988).

Even as the telecommunications sector was being liberalized in the early 1980s, plans were already afoot to privatize JTM. By 1985, a series of legislative changes were carried out to make this possible. Two years later, on January 1, 1987, Syarikat Telekom Malaysia Berhad (STM) officially took over the operational responsibilities of JTM. Subsequently, the government sold 25 per cent of STM's equity to the public via a public listing exercise in 1990. (With the public listing, STM was renamed Telekom Malaysia Berhad or TMB). To date, the government continues to own about 70 per cent of TMB's equity through various agencies (Telekom Malaysia Berhad, 2000).² In addition, the government owns a single unit "golden share" which entitles it to veto on major decisions that have national interest implications. This arrangement is common amongst major privatized utilities, e.g. Malaysian Airlines (MAS) and Tenaga Nasional Berhad (or TNB, the incumbent power utility).

After the privatization of TMB, the government continued to liberalize the telecommunications market despite having substantial shareholding interests in the incumbent firm. Kennedy (1990, 1995) and Jomo and Gomez (1999) suggest that political patronage was responsible for the liberalization of the sector before and after the privatization of JTM. Liberalization in the post-privatization era mainly took the form of entry into two major markets, fixed line and cellular services. Between 1993 and 1995,

¹ Adam and Cavendish (1995: 129), for example, regarded privatization as the second phase in the NEP where assets accumulated by the government on behalf of the Bumiputeras were redistributed to individual Bumiputeras and Bumiputera institutions.

five additional licenses to operate in the fixed line market were approved (**Table 3**). Despite the increase in the number of participants in the fixed line market, the incumbent's (TMB) market share remained unchallenged – TMB's market share in 2000 is estimated to be as high as 96.7 per cent (TIME dotCom, 2001, 26). The prohibitive cost of building a fixed line network from scratch discouraged other license holders from competing with TMB in this market. Furthermore, the advent of cellular phone services offered greater growth opportunities at lower investment costs compared to fixed-line services.

The lower start-up cost in terms of investment in the cellular phone services market compared to the fixed-line market meant that the issuance of new licenses in the former introduced new competitors in the market. The first cellular phone services (the NMT450) in Malaysia was introduced in 1984. Subsequently, a second license was issued in 1988 to a STM's subsidiary (STM Cellular Communications Sdn. Bhd.) to provide cellular phone services based on a more advanced technology (ETACS ART 900). In 1989, STM sold 51 per cent of its share in the subsidiary company to Alpine Resources Sdn. Bhd.. In the following year, STM sold its remaining 49 per cent share in the company. Following this event, the company was renamed Celcom Sdn. Bhd.

Although (after the first year of operation) the incumbent firm STM had twice the number of subscribers (57,000 in 1990) than its former subsidiary company (Celcom, which had 23,000 subscribers in 1990), its subscriber base was quickly overtaken within two years. By 1992, Celcom's subscriber base was 123,330 against TMB's 83,118. TMB's market share continued to decline after an additional six licenses were issued in

² The detailed breakdown are as follows - Khazanah Nasional Berhad (36.1%), Minister of Finance, Inc.

1993 and 1994. TMB's market share would have been even worse had it not acquired two operators in the market (Emartel from MRCB in 1996 and Mobikom in 1998).

Aside from market entry via the issuance of licenses, technological change has been an important contributing factor to the intensification of competition in the cellular phone service market. Prior to 1995, cellular phone services offered by TMB (ATUR450), Celcom (ART 900) and Mobikom were first-generation platforms that featured analog voice services. In 1995, the introduction of second-generation platforms featuring digital voice services essentially created a more level-playing field in the market. TMB's GSM-based service (TM Touch) had 2,513 subscribers in 1995, a figure substantially less than other operators offering digital cellular phone services. For example Celcom's GSM services had 25,820 subscribers, Maxis (formerly known as Binariang) had 25,820 and DiGi (formerly Muitara Telecommunications) 23,878 in 1995. By the year 2000, both Maxis and DiGi had increased their market share in the cellular phone services market substantially to 26.5 per cent and 17.3 per cent respectively. The market shares of both incumbents (Celcom and TMB) were eroded significantly (see **Table 4**).

The significant market share gains made by upstarts such as DiGi were partly due to the sale of pre-paid cellular telephony services. Digi was the first firm to launch pre-paid services in January 1998. Not long after this, in the same month, Celcom introduced their own pre-paid services. Other companies followed suit – TMB's TMTouch in December 1998 and Maxis in October 1999. Despite these developments, DiGi appears

(21.3%), Bank Negara Malaysia (8.23%) and Permodalan Nasional Berhad (4.5%).

to have benefited from the first move advantage – its market share of the pre-paid market is estimated to be more than 40 per cent in year 2000.

Another important telecommunications market that has been liberalized is the internet service provider (ISP) market. The incumbent in this market is MIMOS Berhad, originally a government-owned research institute that was established to promote research and development in the electronics and communications industries.³ MIMOS began providing internet service in 1987. Nine years later, a second ISP license was issued to TMB. In 1998, five additional licenses were issued to the other major firms in the sector (TIME, Maxis, Mutiara, Celcom and Prismanet). Of these, three companies (TIME, Maxis and Celcom) began offering ISP services in 2000. The ISP firms with the largest market shares are MIMOS and TMB with a combined market share of more than 70 per cent in 2000.

3. REGULATORY REFORMS

The two major events that have significantly transformed the regulatory regime for the telecommunications sector in Malaysia have been privatization (1987) and the enactment of the Communications and Multimedia Act in 1998.

3.1. Privatization and the Change in Regulatory Structure

Prior to 1987, telecommunications services were provided by Jabatan Telekom Malaysia (JTM) - a government department under the Ministry of Energy, Telecommunications and Posts (METP). As such, the sector was self-regulated with JTM receiving

instructions directly from the ministry. Privatization brought about a fundamental change in the regulatory structure in telecommunications.

First, the Telecommunications Act of 1950 was amended to make JTM the regulatory authority for the sector. Decisions pertaining to licenses (an important market entry condition) continued to be made by the Ministry of Energy, Telecommunications and Posts (METP) (as provided for in the Telecommunications Act). Second, the passage of the Telecommunications Service (Successor Company) Act of 1985 paved the way for Syarikat Telekom Malaysia Berhad (STM, the precursor of TMB) to take over the provision of telecommunications services from JTM, which it did in 1987. With these developments, the provision of telecommunications services and regulatory function were, for the first time, assumed by different organizations.

In 1994, the Ministry of Energy, Telecommunications and Posts issued a 28-page policy paper for the telecommunications sector titled *The National Telecommunications Policy* (NTP). Essentially, NTP contains a set of policy recommendations - both at the macro (general) and micro (specific) levels – aimed at developing the sector between the year 1994 and 2020. The termination year for the policy (i.e. 2020) coincides with the target date for the achievement of developed country status by Malaysia – a policy objective dubbed *Vision 2020* that was announced by the Prime Minister Mahathir Mohamad in February 1991.

In many respects, the NTP foreshadowed some of the important changes that were going to take place in the regulatory policies of the sector. It is explicitly stated in the NTP that competition is an important dimension of regulatory policy:

³ MIMOS or the Malaysian Institute of Microelectronic Systems was established in 1985 and corporatized

“The NTP’s main approach is to encourage a healthy and orderly competition ... The main objective of the telecommunications sector is to encourage competition in the telecommunications sector in order to achieve efficiency and to provide excellent and quality service.”

(National Telecommunications Policy, p. 9)

Despite this emphasis on the importance of competition, the government did not subscribe to a totally laissez faire approach:

“Even though competition is encouraged, the Government is empowered to determine the number of competitors that are economically viable for certain telecommunication systems / services ...”

(National Telecommunications Policy, p. 10)

Another important aspect of the NTP is how the industry structure is perceived within the regulatory framework. The industry structure is described in the NTP as comprising two major components:

- Network infrastructure, made up of:
 - (a) basic network infrastructure and (b) value added network infrastructure; and
- Telecommunications services, made up of:
 - (a) basic telecommunications services and (b) value-added telecommunications services.

in 1996.

This view was consistent with then prevailing licensing practices where licenses were service-specific (telecommunication, cellular, internet) and technology-specific (e.g. AMPS, GSM, PDC in the cellular market). However, with the passage of the Communications and Multimedia Act 1998 (CMA) four years later, the licensing structure was to change. Aside from this, CMA brought about a more formal approach to the treatment of competition in the new regulatory structure.

3.2. The Communications and Multimedia Act 1998 (CMA) and the Malaysian Communications and Multimedia Commission

In November 1998 the Malaysian Government restructured the Ministry of Energy, Telecommunications, and Post (METP) into the Ministry of Energy, Communications and Multimedia (MECM). A major reason for this restructuring exercise was to bring the regulatory structure in line with technological developments, in particular, the convergence in communications and multimedia industries. (The Ministry defines convergence as “the progressive integration of the value chains of traditional communications and content industries within a single value chain based on the use of distributed digital technology.”, <http://www.ktkm.gov.my>).

Concurrent with this restructuring exercise, a new regulatory authority for the sector, the Malaysian Communications and Multimedia Commission (CMC), was formed. The Commission comprise of five members. Even though only a single member of the Commission is a government representative, all five are appointed by the Minister of Energy, Communications and Multimedia. In April 1999, the CMC assumed the regulatory mandate for the sector with the passage of the both the *Communications and*

Multimedia Act 1998 (CMA 1998) and the *Malaysian Communications and Multimedia Commission Act 1998* (CMCA 1998). The former spells out the regulatory institutions and structure for the industry whilst the latter details the function, powers and operational aspects of the CMC.

The CMA 1998 is a comprehensive piece of regulatory legislation. Its enactment streamlines the regulatory structure by consolidating the many legal statutes (Telecommunications Act, Broadcasting Act) and regulatory authorities (METP, JTM, Ministry of Information) for telecommunications and broadcasting by putting them under a single umbrella regulatory framework.

Under the present regulatory framework, the Minister of Energy, Communications and Multimedia is the most influential institution (see **Figure 1**). The Minister makes all key decisions pertaining to regulatory policies. The CMC provides policy recommendations to the Minister and is responsible for the enforcement of regulatory policies and legislation (the CMA 1998). In the case of the issuance of licenses, the Commission administers the application and renewal process, makes recommendations but the final decision is up to the Minister.

There is a greater role for public participation in the present regulatory framework. The CMA 1998 provides for the conduct of public inquiries by the CMC on regulatory matters. The CMC has used this avenue to solicit opinions from operators during the process of drafting regulatory policies (e.g. Access List Determination). Typically, discussion papers are published on CMC's website (<http://www.cmc.gov.my>) and the public is invited to submit their views within a given period (at least 45 days). The CMA 1998 also allows for the setup of an Appeal Tribunal to review CMC decisions

and direction when the need to do so arises. Another avenue for public participation is the establishment of industry forums that act as a consultative body to the CMC in important issues such as access code, consumer code, content code and technical code. Thus far, two industry forums have been established namely the Consumer Forum and the Content Forum.

Even though the CMC takes directives from and makes recommendations to the Minister of Energy, Communications and Multimedia it is an organization outside the Ministry. Unlike its predecessor, JTM, this setup provides the CMC with greater flexibility with regards to regulatory initiatives. This is crucial as it embarks on new functions such as monitoring competition. Besides, as a statutory body with its own funds, the CMC also has greater flexibility in staff recruitment. In particular, since its establishment, it has adopted a “greenfield” approach to staff recruitment i.e. hiring people from the private sector, the industry and other regulatory bodies.

3.3. Regulatory Principles

The CMA 1998 has substantially clarified and deepened the regulatory framework for the communications and multimedia sector. Under the Act, regulatory activities are classified into four key areas: economic regulation, consumer protection, technical regulation and social regulation (see **Table 5**).

(a) Economic Regulation

The objective of economic regulation is to ensure that the communications and multimedia industry is efficient. This is to be achieved through the implementation and

enforcement of three types of regulatory policies – licensing, competition policy and service access.

The licensing structure underwent significant changes under the CMA 1998. Previously, licenses were issued for specific technologies and services such as telecommunication license, broadcasting (TV or radio) license, cellular license, ISP license and VAN license. Under the CMA 1998, licenses were issued for four major categories of activities, namely content application services, application services, network services, and network services. This new licensing structure takes cognizance of the potential for vertical separation, allowing competition at different levels along the upstream-downstream continuum of the industry (akin to enhancing horizontal competition). The activities-based licensing is also expected to facilitate the introduction of convergent services.

Prior to the CMA 1998, previous telecommunications legislation (Telecommunications Act 1950) did not have any provisions on anti-competitive conduct. Recognizing the importance of market competition in the achievement of efficiency and in the absence of a national competition law, the CMA 1998 took the bold step of addressing this issue by incorporating in the Act prohibitions of anti-competitive practices. Since its enactment, the CMC has published a series of guidelines on relevant concepts such as “substantial lessening of competition” (CMC, 2000a) and “dominant position” (CMC, 2000b). It has also published guidelines on the procedures and processes for assessing and remedying anti-competitive conduct (CMC, 2000c).

Access to essential facilities such as the fixed network is an important pre-condition in ensuring level-playing field competition in the telecommunications market.

To this end, the CMA 1998 provides for the determination of an access list. The determination of the access list was completed and came into effect in April 2001. Having settled the issue of access list, the CMC is currently looking into the issue of access codes and pricing.

(b) Consumer Protection

Consumer protection is undertaken to ensure that consumers' needs in terms of access, affordability, and service quality are met. To meet these objectives, the CMA 1998 provides for the implementation of regulatory policies and if necessary, institutions to deal with key issues such as service quality, required applications services, consumer disputes, rate regulation and universal service provision. The two areas that have received the most attention from public are rate regulation and universal service provision.

The CMA 1998 has provisions for market-based rate setting (i.e. cost-oriented and no cross-subsidies) but ironically it also provides for the Minister to intervene on this matter. The latter tends to dominate the former - thus tariff re-balancing requires Ministerial approval. Equal Access by way of call-by-call – which enables subscribers to choose their long-distance (STD) or international (IDD) carrier via dialing of a 3-digit selection code – was implemented in January 1999.⁴ An important aspect of the implementation of the Equal Access is the ruling that operators are not allowed to offer rate discounts that exceed TMB's published rates by more than 20 per cent. This ruling was implemented to allow for a smooth transition to cost-based pricing and avoid a price war (which was considered undesirable for the long-term viability of the industry). An

even more ambitious version of Equal Access, by way of pre-selection – which allows subscribers to permanently pre-select the long distance or international carrier without dialing a selection code – has been deferred.⁵

The CMA 1998 provides for the establishment of a Universal Service Fund (USF) to improve network facilities and services in underserved areas and for underserved groups within the community. Prior to 1999, TMB was the only network operator required to fulfill universal services obligations (USO). In the mean time (for 1999 and 2000), other network operators were required to contribute to the provision of universal services in proportion to their revenues and weighted by services (CMC, 2001a). The USO regime in Malaysia is currently undergoing transition to a full USF-based system.

Prior to the CMA 1998, provisions on service quality and consumers' needs were subsumed under very brief objective statements (e.g. “... the Director General shall have regard to – (a) efficiency and economy; (b) satisfying all reasonable demands for telecommunication services ...”, Section 3B, (2) of the Telecommunications Act 1950). The CMA 1998 makes explicit provisions for the formation of a Consumer Forum (established in February 2001) to deal with matters pertaining to consumer protection.

(c) Technical Regulation

Technical regulation is important to ensure technical inter-operability of networks, efficient allocation of resources and the safety, security and integrity of network services and applications services (Syed, 1999). The key areas under technical regulation are spectrum assignment, numbering and electronic addressing, and technical standards. The

⁴ Equal Access was a policy formulated by the Minister and CMC's predecessor, JTM. Efforts to implement it was deferred from 1995 to 1999.

⁵ Equal Access by pre-selection was originally scheduled to implemented on 1 January 2001. A review of this proposal will be made in mid-2001.

CMC can issue spectrum assignments to operators but only after the Minister has determined the frequency bands for it.

(d) Social Regulation

Social regulation is meant to ensure that content applications and services reflect national cultural aspirations. This area of regulation is targeted at offensive content. There is no mention of Ministerial intervention in this matter but the Minister's control over licenses certainly provides a strong case for some form of moral suasion. The CMA 1998 also has provisions for the promotion of public education. As provided by the CMA 1998, an advisory and consultative body in the form of the Content Forum was designated by the CMC in March 2001.

4. IMPACT OF REFORMS

The impact of reforms has to be evaluated against the objectives of implementing them, namely efficiency and equity. Based on several indicators (such as return on assets, revenue per subscriber, production per employee, direct exchange lines per employee and response rate to customer complaints), TMB's financial performance seems to have improved after it was privatized in 1987 (see **Table 6**).

But these are achievements that were made over a period of ten years. Revenue per subscriber, for example, seems to have increased by 30 per cent during this period. This is not very substantial if one considers the fact that between 1987 and 1997, TMB's operating revenue grew at an average annual rate of close to 14 per cent. Still, substantial

improvements were made in productivity. For example, production per employee rose by 6.4 times its value in 1987.

Since its privatization in 1987, TMB has faced competition from other operators in two areas – cellular mobile phone services and the long distance and international call market. Competition in the cellular services market increased with the entry of three major operators (Maxis, DiGi and TIME) in 1995. The implementation of Equal Access in January 1999 also paved way for competition in the long distance and international call market. Have consumers benefited from these developments? To date, no empirical studies have been carried out to address the question of price changes in the market. The average revenue per unit (ARPU) is reported to have declined from RM150 to RM120 for postpaid services and from RM90 to RM60 for prepaid services.⁶ However, this is probably due to the expansion of the subscriber base to include lower-spending users. Competition in the long-distance and international call market is also driving rates down but this has been limited by the maximum discount ruling (not more than 20% off TMB's rates). TMB, for example, offered discounts between 15-20 per cent on its national and international calls in June 2000. A month later, Celcom too began offering discounts on its domestic and international calls.⁷

Telecommunications operators will continue to invest in the sector only if they are assured that they are able to recoup as well as earn a reasonable rate of return on the investments. Does the telecommunications sector in Malaysia fit this description? In the presence of high start-up costs, ever-changing technology and over capacity, most of the

⁶ See http://www.britain.org.my/trade/sector_summary/telecommunications.htm. Handset subsidies are also eroding the margin from cellular service business. See Malaysian Business, March 1, 2000.

⁷ Malaysian Business, March 1, 2000.

operators are heavily indebted. Total corporate debt in the sector is estimated to be in excess of RM12 billion.⁸ In the past, these companies have sought foreign partners to meet the substantial investment cost and as well as expertise requirement. However, there is a 30 per cent limit on foreign participation in domestic telecommunications companies. During the financial crisis period, this foreign ownership limit was temporarily relaxed, first to 49 percent in February 1998 and later to 61 per cent in April 1998 (on a case to case basis provided the funds used to purchase these stakes come from abroad). At present three of the major operators have foreign partners: Maxis (33% share owned by British Telecom), Celcom (21% by Deutsche Telekom AG) and DiGi (30% by Telenor International AS).⁹ This pragmatic policy has meant that the equity aspect of the telecommunications reforms has for the time being taken a back seat.

5. FUTURE POLICY AGENDA

Market forces were brought to bear on the sector with liberalization and privatization policies in the 1980s. A decade later, in 1998, the *Communications and Multimedia Act 1998* (CMA 1998) marked a new phase in telecommunications reform in Malaysia – that of consolidating and strengthening the regulatory structure and institutions in the sector. For the first time, the implications of convergence for regulation were taken into account. Today, a plethora of common regulatory issues continue to be addressed - competition, access, universal services, among others. But numerous policy issues remain unresolved in the communications and multimedia sector in Malaysia.

⁸ Business Times, May 9, 2001.

⁹ In May 2001, British Telecom announced that it would be divesting its stake in Maxis.

A fundamental principle underlying the CMA 1998 is transparency. Public participation through public inquiries and industry forums is a good start. However, it is still unclear whether a more extensive notion of transparency is desirable and possible since key regulatory policies and decisions are ultimately made by the Minister of Energy, Communications and Multimedia.

The CMA 1998 provides for market-based rate-setting but this has not been fully implemented. The rates for cellular services are no longer regulated (as of August 2000) but local fixed line services continue to be regulated by the government to ensure affordability. This continues to be an obstacle to tariff rebalancing i.e. removing cross subsidies between long-distance and international services and local fixed line services. Perhaps, other market-based approaches ought to be considered, for example, allowing local rates to be market-based with operators offering special rates for economically disadvantaged groups. Ultimately, the choice of a rate-setting system is crucial as this has implications for productivity improvements (e.g. via incentive regulation) and investment incentive in the industry.

Competition policies and laws are virtually non-existent in Malaysia. The incorporation of competition issues in the CMA 1998 is an attempt to remedy this. The lack of tradition and experience in this area means that it will be difficult for the regulator (CMC) to take on (as it has) the responsibility for addressing anti-competition conduct in the sector. The government has to consider the option of implementing a national competition law to deal with anti-competitive conduct rather than have each of the regulatory commission in different sectors (telecommunications, power, ports) deal with it.

Market structure and the role of foreign investment in the sector will be important issues in the coming years. With the third-generation cellular technology (3G) in the horizon, the industry will require additional infusion of funds. With most of the existing operators being heavily indebted and the industry facing diminished foreign participation, technological diffusion in the sector may be delayed. In this regard, the issue of market structure will emerge again i.e. what is the optimal number of operators to ensure investment cost can be recouped and excessive duplication avoided. The industry may also consider new options such as pooling the cost of new infrastructure investment.

The above issues will preoccupy the regulatory authority in the coming years. How these are dealt with will have significant impact on the competitiveness of the Malaysian economy. The structural transformation to developed economy that Malaysia so desires will crucially depend on how well it nurtures the development of the communications and multimedia sector.

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Table 1: Malaysia - Telecommunications Indicators, 1970-2000

Sector	1970	1980	1985	1990	1995	2000
Population Size ('000)	8,118	13,879	15,883	18,102	20,689	23,250
Fixed Line Subscribers	107,000	395,640	948,598	1,585,744	3,332,447	4,628,000
Cellular Phone Subscribers	0	0	4,630	84,557	872,790	5,122,00
Internet Subscribers	-	-	n.a.	n.a.	64,000*	1,659,000
Fixed Line Penetration Ratio (per 100 population)	1.3	2.9	6.0	8.7	16.6	21.0
Rural Penetration Ratio (per 100 population)	n.a.	n.a.	n.a.	2.0	5.5	11.7
Urban Penetration Ratio (per 100 population)	n.a.	n.a.	n.a.	n.a.	24.8	28.6

Sources:

Sixth Malaysia Plan; Mid-term Review of the Sixth Malaysia Plan, Seventh Malaysia Plan; Mid-term Review of the Seventh Malaysia Plan, Eighth Malaysia Plan, Malaysian Communications and Multimedia Commission (<http://www.cmc.gov.my>)

* Refers to 1996 Figures.

Table 2: Malaysia - Telephone Penetration Ratio, by State, 1998

State	Population ('000)	GDP per capita (RM)	Telephone Subscribers			Telephone Penetration Ratio
			Residential	Business	Total	
Johor	2,611.6	12,705	447,525	126,054	573,579	21.9
Kedah	1,554.8	8,896	249,975	49,864	299,839	16.9
Kelantan	1,484.1	4,293	112,639	21,320	133,959	9.0
Melaka	587.6	12,785	108,108	32,530	140,638	23.9
N.Sembilan	823.4	12,245	150,270	33,189	183,459	22.3
Pahang	1,264.8	10,784	145,179	34,295	179,474	14.2
Perak	2,106.4	11,682	371,934	79,991	451,925	21.5
Perlis	221.8	8,724	-	-	-	-
P.Pinang	1,234.4	17,509	254,660	91,976	346,636	28.1
Sabah	2,740.0	7,028	154,638	70,723	225,361	8.2
Sarawak	1,990.2	11,108	188,705	78,892	267,597	13.4
Selangor	3,092.8	17,708	754,466	315,880	1,070,346	34.6
Terengganu	1,004.1	20,623	100,031	22,143	122,174	12.1
K.Lumpur	1,390.8	26,442	146,430	182,288	328,718	23.6
MALAYSIA	22,106.6	12,884	3,184,560	1,139,145	4,323,705	19.6

Sources: Department of Statistics, *State/District Data Bank*, 1999
Department of Statistics, *Social Statistics Bulletin*, 1999
Mid-Term Review of the Seventh Malaysia Plan, 1999

Table 3: Major Telecommunications Markets in Malaysia, 2000

Market	Operator	Year License Issued	Year Operation Started	Estimated number of Subscribers in 2000
Fixed Line	Telekom Malaysia Berhad	1987		3.5 million
	Maxis Communications Sdn Bhd	1993		30,000
	TIME dotCom Berhad	1994		5,000
	PrismaNet (M) Sdn Bhd	1994		4,000
	DiGi Telecommunications Sdn Bhd	1995		-
	Celcom (M) Sdn Bhd	1994		-
Cellular Service	Telekom Malaysia Berhad (Atur, Mobikom & TM Touch)	1985	1985	671,000
	Celcom (M) Sdn Bhd (Art900 & Celcom GSM)	1989	1990	1,340,200
	Maxis Communications Sdn Bhd (Maxis)	1993	1995	1,207,000
	DiGi Telecommunications Sdn Bhd (DiGi)	1994	1995	805,000
	TIME dotCom Berhad (TIMECel, formerly ADAM)	1993	1995	447,000
Internet Service Provider	Telekom Malaysia Berhad (TMNet)	1996	1996	350,000
	MIMOS Berhad (Jaring)	1987	1992	800,000
	Maxis Communications Sdn Bhd (Maxis Net)	1998	2000	300,000
	TIME dotCom Berhad (TimeNet)	1998	2000	137,000
	Celcom (M) Sdn Bhd (Celcom.net)	1998	2000	-
	PrismaNet (M) Sdn Bhd	1998	-	-
	DiGi Telecommunications Sdn Bhd (DiGi)	1998	-	-
	NTT MSC Sdn Bhd (Arcnet)	2000	2000	2,000

Sources : Interviews and Media reports

Table 4: Malaysia: Market Shares in the Cellular Phone Market, 1990-2000

Company	Number of Subscribers ('000)		
	1990	1995	2000
Telekom Malaysia Berhad	57 71.3%	99 11.5%	948 18.5%
Mobikom		150 17.5%	(part of TMB)
Celcom (M) Sdn Bhd	23 28.7%	561 65.2%	1,530 29.9%
Maxis Communications Sdn Bhd	-	13 1.5%	1,359 26.5%
DiGi Telecommunications Sdn Bhd		24 2.8%	884 17.3%
TIME dotCom Berhad		13 1.5%	401 7.8%
Total	78	860	5,122

Sources: Communications and Multimedia Commission (CMC)

Table 5: Key Regulatory Principles Under the Communications and Multimedia Act, 1998

Key Functions	Objectives
Economic Regulation	Industry players must have incentives to invest, innovate and interconnect for the benefit of end-users. There should also be incentives to encourage the export of services.
Technical Regulation	Networks and services must be inter-operable, safe, secure, reliable and guarantee the integrity of services delivered.
Consumer Protection	Consumers have rights to high quality service that are reliable, easily accessible, and affordable from the service-provider of their choice.
Social Regulation	Content developers must have incentives to invest and innovate in applications and services that promote Malaysian culture, identity and values.

Source: Communications and Multimedia Commission (2001a)

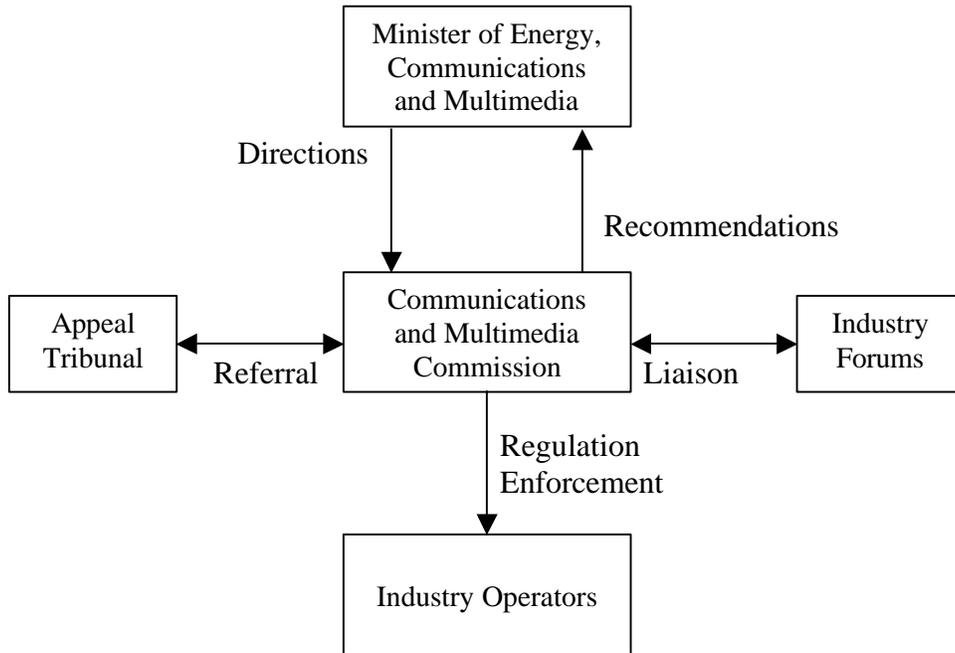
Table 6: Performance of Telekom Malaysia Berhad Before and After Privatization

Indicator	Before Privatization (circa 1986)	After Privatization (1997)
Return on Assets (%)	4.0	7.6
Average Revenue Per User (RM)	1,227	1,609
Production per Employee (RM)	34,372	219,641
Number of Direct Exchange Lines per Employee	36	154
Percentage of Responses to Customer Complaints within 24 Hours	80	91.5
Operating Revenue* (RM million)	1,644.2	7,165.7
Profit Before Tax* (RM million)	4.9	2,376.4
Debt Equity Ratio*	2.3	0.7

Sources: Mid-Term Review of Seventh Malaysia Plan and Poon (2000)

* Refers to figures for year 1997.

Figure 1: The Regulatory Framework for the Telecommunications Industry in Malaysia, 2000



Source: Adapted from CMC (2001a) and the CMA 1998