

**EXPORT OF MALAYSIA BUSINESS-TO-BUSINESS SERVICES:  
AN EXAMINATION OF CIVIL ENGINEERING CONSULTANCY**

**by**

**LAW YUK HUI**

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## LIST OF ABBREVIATIONS

ACEM	Association of Consulting Engineers Malaysia
AEM	ASEAN Economic Ministers
AER	ASEAN Engineers Register
AFAS	ASEAN Framework Agreement on Services
AFEO	ASEAN Federation of Engineering Organisations
APEC	Asia-Pacific Economic Cooperation
ASEAN	Association of Southeast Asian Nations
BEM	Board of Engineers Malaysia
EMF	Engineers Mobility Forum
EXIM Bank	Export-Import Bank of Malaysia Berhad
FTA	Free Trade Agreement
GATS	General Agreement on Trade in Services
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
IEM	Institute of Engineers Malaysia
IMP3	Third Industrial Master Plan
MATRADE	Malaysia External Trade Development Corporation
MIDA	Malaysian Industrial Development Authority
MITI	Malaysia International Trade and Industry
MRA	Mutual Recognition Arrangements
MSE 2008	Malaysia Services Exhibition
MSDC	Malaysian Services Development Council

NAPSEC	National Professional Services Export Council
NEAC	National Economic Action Council
PSDC	Professional Services Development Corporation
UAE	United Arab Emirates
WTO	World Trade Organization

**URUSNIAGA EKSPORT SEKTOR PERKHIDMATAN MALAYSIA:  
SATU PENILAIAN KE ATAS FIRMA PERUNDING KEJURUTERAAN AWAM**

**ABSTRAK**

Lebihan imbangan pembayaran dalam sektor perkhidmatan buat julung kalinya pada tahun 2007 menandakan sektor perkhidmatan bakal menjadi penyumbang ekonomi utama kepada Malaysia, menyusuli sektor industri. Di antara urusan perkhidmatan, perkhidmatan kejuruteraan awam paling memberangsangkan. Di antara 86 disiplin dalam perkhidmatan kejuruteraan, kejuruteraan awam mempunyai jumlah jurutera berdaftar yang tertinggi (iaitu 47.4% bagi tempoh 1986-2006). Satu kajian telah dikendalikan bagi menilai eksport urusan perkhidmatan Malaysia, terutamanya perunding kejuruteraan awam. Data dikumpul daripada kajian soal selidik kiriman pos, temuramah bersemuka dan sumber-sumber sekunder. Soal selidik telah diposkan kepada semua firma perunding kejuruteraan awam. Daripada 73 soal selidik yang dikembalikan, 19 daripada mereka mempunyai pengalaman antarabangsa. Enam temuramah telah dikendalikan atas persetujuan responden. Antara penemuan yang mencabar kajian-kajian terdahulu termasuk firma kecil didapati lebih cenderung dalam pengantarabangsaan berbanding dengan firma besar dan majoriti daripada firma yang dikaji didapati tidak memasuki negara berdekatan, sama ada secara fizikal mahupun psikik. Dalam mod kemasukan pasaran, pengendongan adalah pilihan yang paling popular (89.2%). Kualiti perkhidmatan, dan tenaga kerja yang berpengalaman dan berkemampuan dinilai sebagai aset-aset kompetitif spesifik firma yang sangat penting. Pengiktirafan kelayakan profesional bersama merupakan aset kompetitif spesifik negara yang tertinggi. Bagi faktor perlokasian, firma Malaysia paling prihatin tentang kestabilan politik, dan undang-undang dan ketenteraman di pasaran luar negeri. Penemuan kajian ini boleh digunakan untuk meningkatkan pengeksportan perkhidmatan perunding kejuruteraan awam Malaysia.



**EXPORT OF MALAYSIA BUSINESS-TO-BUSINESS SERVICES:  
AN EXAMINATION OF CIVIL ENGINEERING CONSULTANCY**

**ABSTRACT**

The surplus of balance of payment in the services sectors for the first time in 2007 portends the services sector becoming the main economic contributor to Malaysia, overtaking the industrial sector. Among the business-to-business services, engineering services is the most impressive. Among the 86 disciplines in engineering services, civil engineering has the highest number of registered engineers (i.e. 47.4% for 1986-2006 periods). A study was conducted to examine the export of Malaysia's business-to-business services, notably civil engineering consultancies. Data was collected from postal questionnaire survey, face-to-face interviews and secondary sources. Questionnaires were posted to all civil engineering consultancy firms. 73 questionnaires were returned, with 19 of having international experience. Six interviews were conducted with consenting respondents. Among the findings that challenge past studies include small firms were more likely to internationalise than large firms and the majority of the surveyed firms were not driven to enter psychically or geographically close countries. In terms of mode of market entry, piggybacking was the most popular choice (89.2%). Quality of service, and experienced and capable workforce were regarded as very important firm-specific competitive assets. Mutual recognition of professional qualification was the highest ranked country-specific competitive asset. As for locational factors, Malaysian firms were most concerned about political stability, and law and order in the foreign markets. The findings of this study can be use for increasing the exporting of Malaysia's civil engineering consultancy services.

# **CHAPTER 1**

## **INTRODUCTION**

### **1.1 Introduction**

This chapter provides a brief introduction on internationalisation of Malaysian civil engineering consultancy firms. It begins by research question, research objectives and research scope. The purpose and value of the research is next elaborated. It ends by briefing on the outline of the thesis.

### **1.2 Industry background**

Malaysia's services sector contributed 55.0% to the gross domestic product (GDP) and 52.2% share of employment in 2008 (Ministry of Finance Malaysia, 2009). In terms of trade, Malaysia's services sector experienced a surplus of balance of payment for the first time in 2007, and likewise in 2008. For a decade (1998-2007) in world export of commercial services, Malaysia was ranked among the top 30 countries. These statistics portend services sectors becoming the main economic contributor to Malaysia, overtaking the dependence on industrial sector.

In liberalisation, Malaysia is on track to meet the Association of Southeast Asian Nations (ASEAN) Framework Agreement on Services (AFAS) which targets full liberalisation of all the services sectors by 2015. Most recently, the Government had liberalised 27 services sub-sectors, with no equity conditions imposed.

In the Ninth Malaysia Plan and the Third Industrial Master Plan, the services sector became the major focus, and professional services were highlighted. For professional services, an export fund had been allocated and monitored closely by Professional Services Development Corporation (PSDC), and the National Professional Services Export Council (NAPSEC) (Malaysia International Trade and Industry, 2006).

In nine disciplines listed under professional services, engineering services made the greatest contribution. They were the biggest contributor in terms of value of gross output (1981-2005) and had the biggest number of registered professionals (1986-2005) for two decades. They contributed 0.7% to GDP and engaged 19,984 employees in 2005.

Malaysia signed the Mutual Recognition Arrangements relating to engineering with all 10 ASEAN countries. Malaysia is a party to the Asia-Pacific Economic Cooperation (APEC) Engineer Register, Engineers Mobility Forum (EMF) International Register and ASEAN Engineer Register. Most recently, Malaysia was fully accepted as a Washington Accord signatory, thereby gaining acknowledgement that her engineers meet the necessary quality standards to practise in the international arena.

Among the 86 disciplines in engineering services, civil engineering held the biggest numbers of registered engineers who were governed by the Board of Engineers Malaysia (BEM), Institute of Engineers Malaysia (IEM) and Association of Consulting Engineers Malaysia (ACEM). Table 1.1 highlights some of the Malaysian civil engineering consultancy firms which have exported their services and the projects they were

involved with. It is by no means exhaustive. In all, 62 civil engineering firms were identified as being service exporters.

There has been no study conducted to looking into civil engineering consultancy exporters. Among the three engineering sector representative bodies - Board of Engineers Malaysia (BEM), Institution of Engineers Malaysia (IEM) and Association of Consulting Engineers Malaysia (ACEM) - only ACEM maintained a database of firms which have gone overseas. Coincidentally at the time of the study, the PSDC was compiling its own list of construction-related consultancy firms which had gone overseas. However these two bodies did not examine any aspect about their exporting behaviours.

Table 1.1: Selected civil engineering consultancy exporters and their overseas projects.

COMPANY NAME	PROJECT
MINCONSULT SDN BHD	<ol style="list-style-type: none"> <li>1. Road Employment Project for Settlement &amp; Intergration of Returning Refugees &amp; Displaced Persons. (Afghanistan)</li> <li>2. Rehabilitation of Railway for Brunei LNG Sdn Bhd. (Brunei)</li> <li>3. Highway No.320 Tonglu Zhaiqi-Fuchun Jiang Bridge Section, Zhejiang. (China)</li> <li>4. Geresik Power Plant-Refurbishment of Boilers. (Indonesia)</li> <li>5. Nepal Second and Third Water Supply Project. (Nepal)</li> <li>6. Maidduguri-Baga-Ngubwa Road for Joint Konsult. (Nigeria)</li> <li>7. Design Review and Construction Supervision of National Highways N50 &amp; N70. (Pakistan)</li> <li>8. Pulau Seraya Combined Cycle Power Plant. (Singapore)</li> <li>9. Greater Colombo Water Supply Improvements. (Sri Lanka)</li> <li>10. Amata / Bang Pakong Combined Cycle Power Plant. (Thailand)</li> <li>11. Phu MY 2-1 Gas Turbine Plant. (Vietnam)</li> </ol>
SMHB SDN BHD	<ol style="list-style-type: none"> <li>1. Port Sudan Water Supply Project. (Sudan)</li> <li>2. Chestnut Avenue Waterworks. (Singapore)</li> <li>3. Conceptual Design for Cauvery Water Supply Scheme Stage IV Phase 2. (India)</li> <li>4. Groundwater assessment for EPZ water supply, Hanoi. (Vietnam)</li> <li>5. Water Supply to 4 Towns. (Papua New Guinea)</li> <li>6. Domestic, Medical and Hazardous Waste Management Services in Riau. (Indonesia)</li> <li>7. Review and Design of Wastewater Treatment Plants. (Syria)</li> <li>8. Gadong Sewerage Scheme. (Brunei)</li> <li>9. Houay Champi-Bangliang HEP. (Laos PDR)</li> <li>10. Qiongsan Water Supply Project in Hainan Island. (China)</li> </ol>

	<ul style="list-style-type: none"> <li>11. Vehicle and Pedestrian Study for Jabal Omar Development, Makkah. (Saudi Arabia)</li> <li>12. Master Plan for the New Government Head Quarters Office Complex, Islamabad. (Pakistan)</li> </ul>
PETAREKA PERUNDING (M) SDN BHD	<ul style="list-style-type: none"> <li>1. Nexus Naga Casino &amp; Hotel at Hun Sen Garden, Phnom Penh for Neptune Orient Sdn Bhd. (Cambodia)</li> <li>2. Coal-Fired Power Plant (2x300 MW) at Rembang, for Zelan Bhd. (Indonesia)</li> <li>3. Catering Facility for New Doha Airport. (Qatar)</li> <li>4. New Cement Silos and Existing Silos Modification for Ha Tien Cement at Ho Chi Minh City. (Vietnam)</li> <li>5. 4-Storeys In-Flights Catering Facility, Bandaranaike International Airport, Katunayake, Colombo. (Sri Lanka)</li> <li>6. Public Bank HQ, Phnom Penh. (Cambodia)</li> </ul>
HSS INTEGRATED SDN BHD	<ul style="list-style-type: none"> <li>1. Widening &amp; Strengthening of Narayanpur-Bhanupartapur-Rajnandangaon Road. (India)</li> <li>2. Water Resources Study for Sustainable Integrated Rice Farming &amp; Horticulture (Papua New Guinea)</li> <li>3. Beihai Expressway. (China)</li> <li>4. Kang Keng International Airport, Sihanoukville. (Cambodia)</li> <li>5. Best World Technopark, Cavite. (Philippines)</li> <li>6. Napheng-Longxan Highway. (Laos)</li> <li>7. Madinal Al-Arab Masterplan Study. (Dubai)</li> </ul>
G&P PROFESSIONAL SDN BHD	<ul style="list-style-type: none"> <li>1. Foundation Design of Mixed Development, Vietnam Financial Centre, Ho Chi Minh City. (Vietnam)</li> <li>2. Assembly Dredging, Reclamation and Seawall Works. (Kingdom of Bahrain)</li> <li>3. Proposed Offshore Unloading Facilities for Desalination and Power Plants at Shuqiaq. (Saudi Arabia)</li> <li>4. Geotechnical Review of Quay Wall, Port of Ehoala. (Madagascar)</li> <li>5. Bann Eur-Ar-Thorn Housing Project at Bangna – Trad Road KM.29 Samutprakarn. (Thailand)</li> <li>6. Geotechnical Design of Ground Treatment for Highway &amp; Railway, Soil Treatment for Boubyan Seaport Project. (Kuwait)</li> <li>7. Full geotechnical consultancy, Karachi Port Tower Project. (Pakistan)</li> <li>8. Geotechnical consultancy service for the construction of one 20mt/Hr and one 45mt/Hr palm oil mills, Proposed construction of Nyato Palm Oil Mill in Riau, Sumatera. (Indonesia).</li> </ul>
RANHILL CONSULTING SDN BHD	<ul style="list-style-type: none"> <li>1. Montego Bay Bypass. (Jamaica)</li> <li>2. Bahria Golf City. (Islamabad)</li> <li>3. Petronas Headquarters, Khartoum. (Sudan)</li> <li>4. Hanoi Inn. (Vietnam)</li> <li>5. DHI Jacaranda Family Club, Islamabad. (Pakistan)</li> <li>6. Bul Hanine Arab C Gas Cap Recycling. (Qatar)</li> </ul>
SEPAKAT SETIA PERUNDING SDN BHD	<ul style="list-style-type: none"> <li>1. Jawa Tengah Power Plant, Rembang. (Indonesia)</li> <li>2. Manila Cavite Toll Expressway. (Philippines)</li> <li>3. New Hanger Building For Singapore Airlines, Changi. (Singapore)</li> <li>4. 4-storey Shopping Complex Kiulap. (Brunei)</li> <li>5. Flour Mill in Trincomalee. (Sri Lanka)</li> <li>6. Development of New GHQ Complex, Islamabad. (Pakistan)</li> <li>7. Yen So Park, Hanoi. (Vietnam)</li> <li>8. Jazan Economic City (Kingdom of Saudi Arabia)</li> </ul>

Source: Company websites.

### **1.3 Research question**

The success of Malaysian contractors have been properly monitored and recorded over the last few years by the Construction Industry Development Board. However, there is no such documentation for the civil engineering consultancy sector. The sporadic information about their success abroad comes from media reports which are often irregular. Without such information, it is difficult to prepare strategies for the future international growth for this sector. The research questions for the present research are as follows:

1. Do organisational size, age and legal status influence the Malaysian civil engineering consultancy firms' propensity to export their services;
2. What are their motive to internationalise, which countries did they target, what are their modes of market entry, modes of securing contracts, firm-specific and country-specific competitive assets and locational factors.
3. Does size of firm have an impact on the firms' responses given for motives, modes of securing projects, modes of market entry, competitive advantages, and locational factors.

### **1.4 Research objectives**

This thesis investigates the internationalisation of Malaysian civil engineering consultancy firms. The objectives of the thesis are:

1. To determine whether organisational size, age and legal status influence the Malaysian civil engineering consultancy firms' propensity to export.
2. To examine the motives to internationalise, targeted overseas countries, modes of market entry, mode of securing overseas contracts, the firm-specific and country-

specific competitive assets, and the locational factors that encouraged the firms to enter certain countries as oppose to others.

3. To investigate whether firm size have an impact on the reponses given for motives, modes of securing projects, modes of market entry, competitive advantages, and locational factors.

### **1.5 Research scope**

The thesis only focussed on Malaysia's civil engineering consultancy firms, located in East and West Malaysia. All firms registered with the Board of Engineers were approached for the study.

### **1.6 Research Methodology**

The thesis did not rely on any model which explain the internationalisation of firms, as doing so would have constrained the proper understanding of the subject matter. While each model (e.g. the Eclectic Paradigm, Network Approach, Resource-Based Theory, International Entrepreneurship) has its respective strengths, it also has its own limitations. Adopting any one model would only partially explain the internationalisation phenomenon of Malaysia's civil engineering consultancy firms.

### **1.7 Value of the research**

In general, the study of internationalisation of business-to-business services has been sparse. This was the conclusion made by Netland and Alfinés (2007) after reviewing relevant academic journals published between 1999 and 2005 inclusively. In a small way, the research helps to address this issue.

Among the engineering services sector, civil engineering makes major contributions in terms of value of output and number of registered professionals. Understanding the internationalisation phenomenon of this important sub-sector can aid in the formulation of export promotion programmes and assistance which can have the greatest impact.

## **1.8 Outline of thesis**

This thesis is divided into seven chapters. Chapter 1 introduces the study. Chapter 2 briefly reviews Malaysia's economy and services trade, Malaysia's engineering consultancy services, and government assistance to business-to-business services firms. Chapter 3 reviews the literature of internationalisation. Chapter 4 provides the details of research methodology. Chapter 5 reports the findings and analysis of the study. Chapter 6 seeks to make a continuous link between the findings of the study and the literature review. Lastly, Chapter 7 highlights the interesting findings and makes suggestions on future research.



## **CHAPTER 2**

### **ENGINEERING CONSULTANCY SERVICES IN MALAYSIA**

#### **2.1 Introduction**

As a prelude to this study, this chapter dwells on the position of services in Malaysia's economy. Malaysia's engineering consultancy services are next discussed, followed by efforts to liberalise trade in services by the World Trade Organisation (WTO), Association of Southeast Asian Nations (ASEAN) and Malaysia. The various international agreements which will exert a strong influence on the internationalisation of Malaysian civil engineering consultancies are deliberated. The chapter concludes by highlighting the actions taken by the Malaysian government to aid the export of professional services, civil engineering consultancy included.

#### **2.2 Malaysia's Services Sector**

The services sector has the biggest share in Malaysia's gross domestic product (GDP). This sector contributed RM 4,875 million to GDP (45.5% share) in 1970 (Ministry of Finance Malaysia, 1976) and it grew to RM 270,761 million (53.6%) in 2007 (Ministry of Finance Malaysia, 2008). Back in 1960, this sector was smaller than all other sectors, constituting only 37% of GDP (Sieh, 2000). The growth of this sector over the past 47 years (1960-2007) was 44.9%. Between 1970 to 1992, the services sector ranged between 40%-48% share in GDP. The services sector however became more important when it surpassed 50% share in GDP in 1993 (except in 1996 when it only recorded 45.3%). The services sector enjoyed the highest share in GDP (i.e. 57%) continuously in 2001, 2002 and 2003. In 2008, this important component of the national economy,

contributed 55.0% to the GDP of which, 47.6% was contributed by non-government services. This sector is expected to continue enjoying high share in Malaysia's GDP with 57.9% in 2009 and 58.5% in 2010 (Ministry of Finance Malaysia, 2009).

In terms of employment, agriculture, forestry and fishing sector was the biggest contributor (53.2%), while the services sector was the second biggest (32.5%) in 1970. The dominance of the agriculture, forestry and fishing sector in generating employment ended in 1982 when the services sector took over as the biggest employment contributor - 39.4% compared to 37.7% for the former. The services sector accounted for 50.0% share in total employment in 2002 and continued to grow above 50% share in employment since then. In 2008, this sector accounted for 52.2% share and is expected to achieve 52.6% share in total employment in 2009 (Ministry of Finance Malaysia, 2009).

In terms of trade, services had faced large deficits in balance of payment for a long time. In almost every year, this large deficit nearly cancelled out the surpluses generated by the merchandise account (Sieh, 2000). The deficit in services account of the balance of payment which widened from RM9.7 billion in 1990 to RM15.0 billion in 1993 was identified as a major issue by the government (Ministry of Finance Malaysia, 1994). Thus, various strategies were formulated to strengthening the balance of payment since then. In 2007, for the first time, Malaysia recorded a surplus in its services trade and likewise in 2008 (see Figure 2.1). The trade in services valued at RM 2,373 million in 2007 contrasted with a deficit of RM7,230 million in 2006 (Ministry of Finance Malaysia, 2009). The surplus indicates the strong improvements in both the growth and

value of exports (Malaysia International Trade and Industry Report, 2007). The trade in services is estimated to suffer a deficit of RM 803 million due to the global recession in 2009. However, it is forecasted to recover immediately to RM 1,518 million in 2010 (Ministry of Finance Malaysia, 2009).

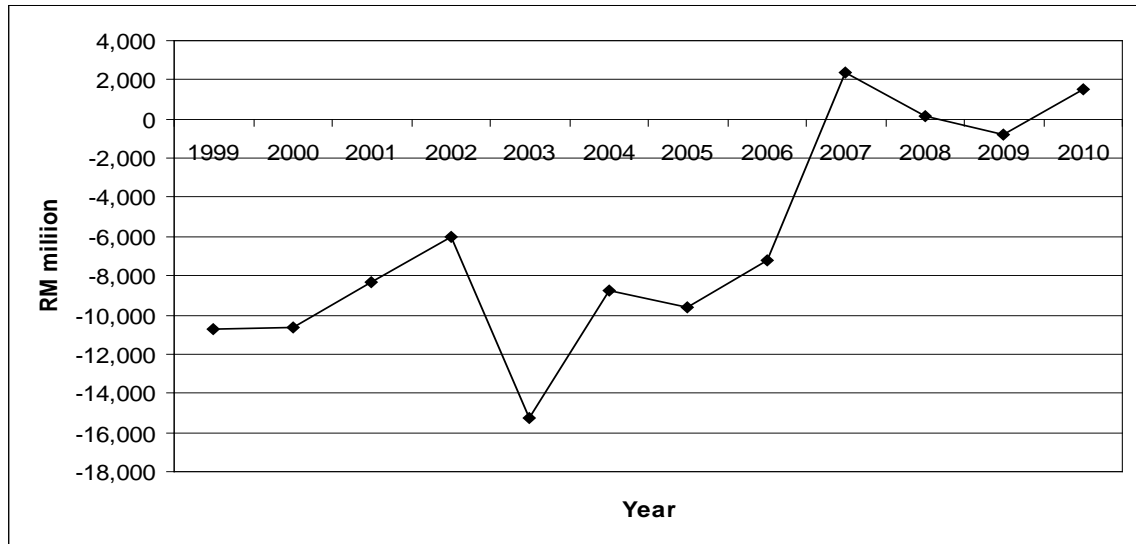


Figure 2.1: Balance of Payment 1999-2010

Source: Ministry of Finance Malaysia (2002, 2005, 2008, 2009)

Note: 2009= estimate, 2010= forecast

: See Appendix 1 for Figure 2.1 value

According to WTO, International Trade Statistics (2008), Malaysia's export of commercial services increased from US\$ 11.4 billion in 1998, to US\$28.1 billion in 2007 (see Table 2.1). Malaysia was among the world's top 30 largest exporter of commercial services in the past decade (1998-2007). There is potential to increase Malaysia's share of world trade in commercial services from the current 0.9%. In aiming to achieve advanced economy status, Malaysia is focusing on the development of the services sector as an important export component of the GDP as the world's trade in

services has grown faster than the merchandise sector for the past two decades (Malaysia International Trade and Industry, 2004). Malaysia is committed to long term, sustainable, and progressive liberalisation for the services sector under the three sets of agreement - the ASEAN Framework Agreement on Services (AFAS), WTO's General Agreement on Trade in Services (GATS), and regional and bilateral free trade agreement (FTA).

Table 2.1: World export of commercial services, 1998-2007

<b>Year</b>	<b>World (US\$ billion)</b>	<b>Malaysia (US\$ billion)</b>	<b>Share (%)</b>	<b>Ranking</b>
1998	1,340.4	11.4	0.9	28
1999	1,392.3	11.8	0.9	28
2000	1,478.4	13.8	0.9	27
2001	1,481.8	14.3	1.0	26
2002	1,593.8	14.7	0.9	27
2003	1,829.3	13.4	0.7	29
2004	2,209.9	16.9	0.8	29
2005	2,473.4	19.4	0.8	29
2006	2,777.9	21.7	0.8	29
2007	3,291.5	28.1	0.9	30

Source: International Trade Statistics (2008).

### **2.3 Malaysia's Engineering Consultancy Services**

According to the Department of Statistics Malaysia, engineering consultancy services refer to the provision of consultancy engineering services for others on a fee or contract basis. These services must be provided by establishments operated by persons registered under Section 7 (1) of the Registration of Engineers Act, 1967 (Revised 1987).

Malaysia's engineering consultancy services are represented by Board of Engineers Malaysia (BEM), Institute of Engineers Malaysia (IEM) and Association of Consulting Engineers Malaysia (ACEM). BEM is a statutory body under the Ministry of Works,

IEM is a learned body promoting the development of profession and ACEM is a self-regulatory body which monitors consulting engineering practices. According to BEM, there are 86 types of engineering disciplines under which professional engineers practise, civil engineering being one of them.

### **2.3.1 Number of Establishments**

The number of engineering consultancy establishments in Malaysia had grown from only 54 in 1971 to 1,089 establishments in 2005 (see Figure 2.2). In the first ten years (i.e. 1971-1981), the number of engineering establishments grew rapidly from 54 establishments to 293, representing a remarkable 442.6% growth rate. For the next ten years (1981-1991), the growth in establishment was 43.0%. The growth contracted from 1984 until 1988, except in 1986 when the number grew by 5.3% compared to the year before. The number of establishments continued to increase from 1991-1999, between 6%-8% growth rates. These growth rates however slowed down between 1996-1999 to only 3%-4%. Rapid growth was recorded after 1999 with 15.9% growth in 2002, 18.7% in 2003 and 51.7% in 2005. The overall growth rate from 1991 to 2005 was 159.9%.

The trend in the number of engineering consultancy establishments was influenced by the national GDP. The number of establishments fell by 0.3% in 1984 and 0.6% in 1985, in line with the contraction of the GDP from 7.8% in 1984 to -1.0% in 1985. The number of establishments grew steadily when GDP grew at 8%-10% between 1990-1995. The recession in 1997-1998 contracted the GDP by 7.4%. This downturn also caused the slow growth of establishments between 1996 to 1999.

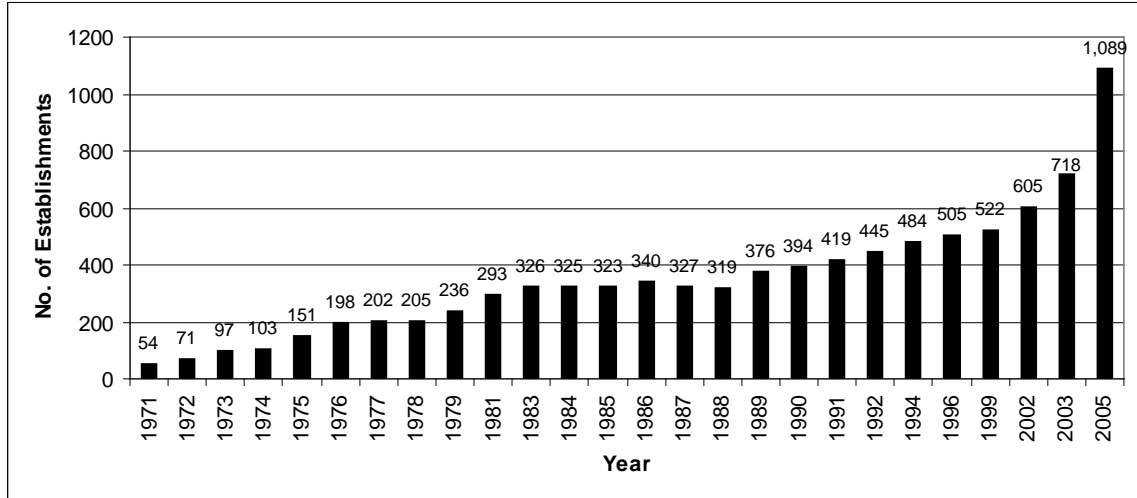


Figure 2.2: Number of Establishments in Malaysia from 1971 to 2005

Source: Malaysia Economic Statistics-Time Series (2007)

Note: No census/survey was conducted for years 1980, 1982, 1993, 1995, 1997, 1998, 2000, 2001 and 2004.

### 2.3.2 Size of Establishments

In terms of size, most Malaysian engineering firms have been small and medium. For five selected years, 89.6% of engineering establishments were small and medium (i.e. less than 50 employees) and only 10.4% were large (50 employees and above). Engineering firms with less than five persons decreased from 118 to only 93 in 2002, but drastically increased in 2003 to 170. This marked an 82.8% growth compared to the previous year. Establishments with 5-9 employees, 10-19 employees and 20-29 employees continuously grew between 1994-2003. Between 1994 and 2003, establishments with 5-9 employees were the highest growth group with 81.3%. Establishments with 10-19 employees accounted for 50.0% of growth, followed by 20-29 employees (48.4%), 30-49 employees (47.7%), less than 5 employees (44.1%) and 100-199 employees (21.4%). Establishments with 50-99 employees did not grow in number in 2003, compared to 1994, and there was a decrease in the number of

establishments in excess of 200 workers from nine in 1994 to eight in 2003. Table 2.2 shows that the size of Malaysia engineering establishments in employment size group.

Table 2.2: Number of establishments

Total/Year	No. of Establishments				
	1994	1996	1999	2002	2003
Below 5	118	111	100	93	170
5-9	91	84	126	145	165
10-19	110	121	133	156	165
20-29	62	56	67	81	92
30-49	44	64	52	74	65
50-99	36	40	26	35	36
100-199	14	17	10	12	17
200 and above	9	12	8	9	8
Total	484	505	522	605	718

Source: Censuses of Professional and Institution Establishment-Private Sector (1994, 1997, and 2000) and Censuses of Professional Services-Private Sector (2003 and 2004).

### 2.3.3 Legal Status

There are four types of legal status for Malaysia engineering firms: individual proprietorship, partnership, private limited companies, and public limited companies. Between 1994-2003 inclusively, 65.3% of the establishments were private limited companies, followed by individual proprietorship (25.0%), Partnership (9.7%) and public limited company (0.1%) (see Table 2.3).

Private limited companies accounted for 56.8% share in total establishments in 1994. They grew to 73.4% share in 2002, but decreased in 2003 with 67.3% share. Individual proprietorship establishments had 31.6% share in total establishment in 1994, but reduced to 16.8% by 2002. However they recorded growth in 2003 with 24.5% share. Partnership establishments had only 11.6% share in total establishments in 1994 but

continued to decrease to only 8.2% share by 2003. The smallest share was occupied by public limited company – even then only three in 2002.

Table 2.3: Legal Status of Engineering Firms

Legal Status/ Year	1994	1996	1999	2002	2003
Individual Proprietorship	153	152	114	102	176
Partnership	56	52	47	56	59
Private Limited Company	275	301	361	444	483
Public Limited Company	0	0	0	3	0
Total	484	505	522	605	718

Source: Censuses of Professional and Institution Establishment-Private Sector (1994, 1997, and 2000) and Censuses of Professional Services-Private Sector (2003 and 2004).

#### 2.3.4 Number of Registered Engineers

As shown in Figure 2.3, the number of registered engineers grew annually from 1985 until 2006. During that time, the growth of registered engineers was 268.4%. The growth of the first ten years (1985-1995) was 79.9% and the next ten years (1996-2006) was 90.6%.

Unlike the number of establishments, the number of registered engineers was not influenced by national GDP growth. The annual increase of registered engineers ranged from 4.0% to 7.5% between 1985 to 1996. However, the growth of registered engineers was the lowest in 2000 (1.5%) after it recorded huge growth the previous year (10.6%). Between 2001 to 2006, Malaysian registered engineers enjoyed steady growth in number, ranging from between 6.0% to 8.3%.



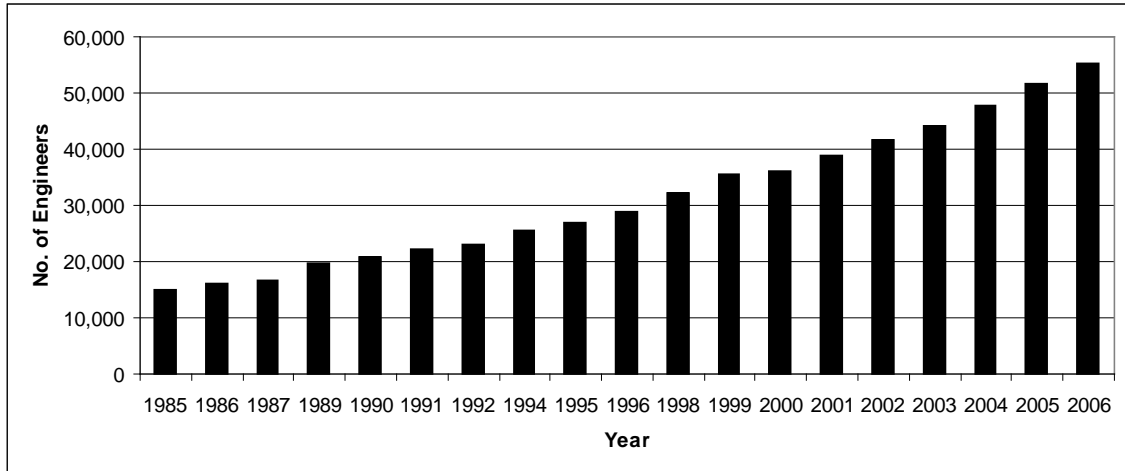


Figure 2.3: Number of registered engineers in Malaysia from 1985 to 2006

Source: Yearbook of Statistics Malaysia (1986, 1987, 1988, 1990, 1991, 1992, 1994, 1996, 1999, 2002, 2003, 2004, 2005, 2006, 2007)

Note: See Appendix 2 for Figure 2.3 value

### 2.3.5 Contribution to Economy

The importance of the engineering consultancy to the economy can be examined from its contribution to GDP and employment. Both are discussed below.

#### 2.3.5.1 GDP Contribution

Between 1990-2006, the average contribution to GDP by the engineering services was 0.6% (see Table 2.4). During that time, Malaysia's export grew by 573.3%, while engineering services in gross output by 778.3%. Engineering services had contributed in excess of 0.5% to GDP between 1990-1996 when Malaysia's construction industry was booming. However, the recession faced by Malaysia between 1997-1998 badly effected the construction industry and engineering services as well. Consequently, the engineering services GDP dropped from the high of 0.8% in 1996 to only 0.4% in 1999. The recovery after recession increased the contribution of the engineering sector to GDP,

from 0.4% in 2002 to 0.5% in the following year. In 2005, the contribution of the engineering sector to GDP was 0.7%.

Table 2.4: GDP contributed by engineering services

Year	Malaysia Export (RM million)	Engineering services in gross output (RM million)	Engineering services to GDP (%)
1990	79,646.4	404.0	0.5
1991	94,496.6	644.7	0.7
1992	103,656.7	714.4	0.7
1994	153,921.2	1,019.5	0.7
1996	197,026.1	1,482.6	0.8
1999	321,559.5	1,310.3	0.4
2002	357,430.0	1,492.9	0.4
2003	397,884.4	1,991.6	0.5
2005	536,233.7	3,548.4	0.7

Source: Yearbook of Statistics Malaysia (1992, 1994, 1996, 1999, 2002, 2003, 2004, 2005, 2006, 2007)

### 2.3.5.2 Total Employees

Based on past statistics, the engineering services sector generates hundreds of job opportunities annually. Between 1971 and 2005 inclusively, the number of employees engaged by the engineering services sector displayed an upward trend, but dipped for two different periods, i.e. 1985-1987 and 1996-1999 (see Figure 2.4). Between 1971 until 1984, the number of employees increased annually. It shrank by 3.9% in 1985, 8.5% in 1986 and 11.9% 1987. However, the trend reversed in 1988 when it recorded 0.3% growth. From 1989 to 1991, total employees rapidly grew at above 20%. The total employees in the engineering services sector dipped significantly between 1996 and 1999 by 24.4%.

Similar to the growth establishments, the growth of total employees has been influenced by the national GDP. The recession in 1985 led to -1.0% in GDP growth. As indicated earlier, the deficit in GDP shrank total employees between 1985-1987. The recession in 1997-1998 was much worse compared to the recession of 1985, with -7.4% growth in GDP. Concomitantly, the number of employees in the engineering services consultancy dropped by 24.4% in 1999.

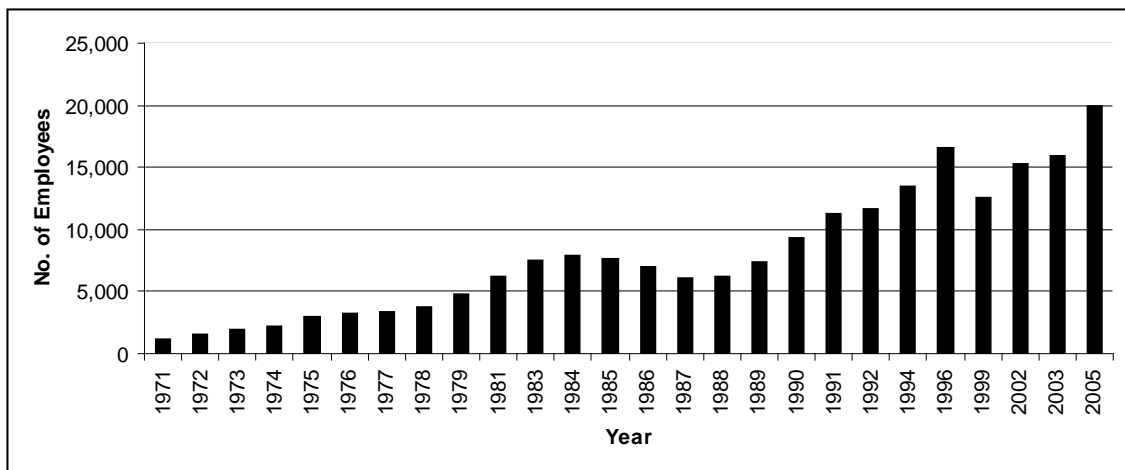


Figure 2.4: Total employee in engineering services from 1971 to 2005

Source: Malaysia Economic Statistics-Time Series (2007).

Note: See Appendix 3 for Figure 2.4 value

## **2.4 Engineering Consultancy Services in Professional Services**

The Department of Statistics compiles data on nine disciplines listed under professional services. They are accounting, architectural consultancy, drafting consulting, dental, medical, engineering consultancy, legal, surveying consultancy and veterinary. In this section, the engineering consultancy services are compared with the eight others.

In two decades (1981-2005), the number of establishments grew by 259.7%, total persons engaged in professional services by 240.2% while total value of gross output by 1,176.1%. As for total number of registered professionals, the increase was 259.2% in a decade (1986-2006). All these are elaborated below.

### **2.4.1 Number of Establishments**

In two decades (i.e. 1981-2005), professional services establishments grew by 259.7%, from 3,792 in 1981 to 13,638 in 2005 (see Table 2.5). For the same period, medical services contributed the largest share of 31.7% followed by legal services (23.4%), and accounting services (13.7%).

Together, these three sectors contributed 68.8% of all professional services establishments during the three and half decades. Engineering consultancy services were only the sixth largest contributor (6.5%).

Table 2.5: Number of Establishment 1981-2005

Year	Number of Establishments									Total
	Accounting Services	Architectural Consultancy Services	Drafting Consultancy Services	Dental Services	Medical Services	Engineering Consultancy Services	Legal Services	Surveying Consultancy Services	Veterinary Services	
1981	654	276	152	250	1,166	293	723	254	24	3,792
1983	694	294	161	324	1,286	326	894	295	39	4,313
1984	731	318	198	372	1,338	325	989	339	44	4,654
1985	735	335	200	419	1,356	323	1,071	352	45	4,836
1986	750	324	194	457	1,399	340	1,163	342	47	5,016
1987	751	318	186	480	1,574	327	1,216	344	46	5,242
1988	762	306	167	488	1,665	319	1,258	350	51	5,366
1989	764	340	166	518	1,787	376	1,342	361	59	5,713
1990	903	342	187	505	1,949	394	1,389	365	58	6,092
1991	900	380	182	513	2,359	419	1,444	377	61	6,635
1992	908	401	193	521	2,578	445	1,629	422	72	7,169
1994	940	549	187	592	2,688	484	1,842	450	73	7,805
1996	987	580	164	657	3,094	505	2,078	499	78	8,642
1999	991	730	151	773	3,302	522	2,639	515	78	9,701
2002	1,001	732	144	858	3,332	605	2,955	629	98	10,354
2003	1,383	914	148	929	3,510	718	3,108	690	110	11,510
2005	1,987	1,090	168	963	4,171	1,089	3,293	766	111	13,638

Source: Malaysia Economic Statistics-Time Series (2007)

Note: No census/survey was conducted for years 1982, 1993, 1995, 1997, 1998, 2000, 2001 and 2004

#### 2.4.2 Total Number of Persons Engaged

Professional services engaged 39,557 persons in 1981 and 134,591 persons in 2005 (see Table 2.6). In two decades, the number increased by 240.2%. Legal services were the biggest contributor for that period, recording 24.7%, followed by the medical services sector (19.9%) and accounting services (17.4%). Engineering consultancy services were the fourth biggest contributor with 14.4% share.

Table 2.6: Total Number of Persons Engaged 1981-2005

Year	Total Number of Persons Engaged									Total
	Accounting Services	Architectural Consultancy Services	Drafting Consultancy Services	Dental Services	Medical Services	Engineering Consultancy Services	Legal Services	Surveying Consultancy Services	Veterinary Services	
1981	7,567	3,359	514	1,000	7,748	6,203	7,225	5,869	72	39,557
1983	8,792	3,709	580	1,301	8,513	7,453	9,490	6,559	148	46,545
1984	9,268	4,355	643	1,414	8,711	7,926	10,138	7,165	138	49,758
1985	9,436	4,181	608	1,680	9,062	7,620	11,350	7,040	138	51,115
1986	9,094	3,735	548	1,804	9,204	6,970	12,082	6,539	154	50,130
1987	9,182	3,079	494	1,898	10,140	6,138	12,667	6,285	146	50,029
1988	9,564	2,920	459	1,931	10,727	6,156	13,630	6,354	161	51,902
1989	10,257	3,344	446	2,076	11,502	7,399	14,968	7,168	181	57,341
1990	11,977	4,006	523	2,058	12,899	9,313	16,538	7,753	183	65,250
1991	12,201	4,671	496	2,174	15,251	11,309	17,421	8,556	194	72,273
1992	12,770	5,121	540	2,200	16,699	11,661	19,289	9,342	199	77,821
1994	14,545	7,009	493	2,528	17,427	13,472	22,124	10,317	192	88,107
1996	15,816	8,063	476	2,812	19,687	16,568	25,979	11,563	224	101,188
1999	14,899	7,396	417	3,281	21,223	12,531	28,089	9,082	224	97,142
2002	16,158	8,466	387	3,884	22,106	15,225	32,054	10,675	314	109,269
2003	19,225	9,367	495	4,085	23,411	15,903	32,288	11,007	390	116,171
2005	23,015	11,006	836	4,658	28,707	19,984	34,970	10,947	468	134,591

Source: Malaysia Economic Statistics-Time Series (2007)

### 2.4.3 Value of Gross Output

In 1981, total value of gross output in professional services was RM893.9 million. It grew by 1,176.1% in two decades, recording RM 11,407.2 million in 2005 (see Table 2.7). Although engineering consultancy services were not among the top contributors in number of establishment and number of persons engaged, it was the biggest contributor in terms of value of gross output. In two decades, engineering consultancy services had 21.4% share in value of gross output, followed closely by medical services (20.3%) and legal services (20.1%).

Table 2.7: Value of Gross Output (RM million) 1981-2005

Year	Value of Gross Output (RM Million)									Total
	Accounting Services	Architectural Consultancy Services	Drafting Consultancy Services	Dental Services	Medical Services	Engineering Consultancy Services	Legal Services	Surveying Consultancy Services	Veterinary Services	
1981	115.8	121.3	6.2	18.6	184.9	172.8	152.9	120.1	1.3	893.9
1983	156.4	205.4	8.2	26.7	234.1	269.1	219.8	156.5	3.1	1,279.3
1984	180.8	229.8	9.6	31.4	252.4	309.6	256.6	176.5	3.1	1,449.8
1985	185.1	201.9	8.3	36.5	270.3	291.3	281.4	172.4	3.5	1,450.7
1986	183.3	151.3	6.6	39.3	271.8	266.8	287.2	163.2	3.7	1,373.2
1987	192.3	115.3	6.1	40.8	294.5	212.8	301.7	166.0	3.8	1,333.3
1988	199.0	113.2	5.8	43.9	326.4	217.9	324.7	181.6	4.6	1,417.1
1989	222.8	136.9	6.3	49.6	372.5	304.7	369.1	223.4	5.6	1,690.9
1990	255.9	187.1	8.1	53.3	449.8	404.0	442.2	284.1	6.4	2,090.9
1991	293.9	274.2	9.3	61.5	567.3	644.7	543.6	339.6	7.1	2,741.2
1992	342.2	302.2	10.1	68.5	658.8	714.4	613.0	387.6	7.9	3,104.7
1994	462.1	435.8	10.1	90.5	794.3	1,019.5	841.9	489.3	9.8	4,153.3
1996	649.2	691.2	12.9	118.9	1,078.6	1,482.6	1,161.8	637.6	12.3	5,845.1
1999	883.1	649.4	10.3	152.7	1,240.9	1,310.3	1,379.1	590.7	14.9	6,231.4
2002	845.6	698.7	10.2	200.8	1,452.8	1,492.9	1,557.6	715.5	21.0	6,995.1
2003	1,080.8	759.5	16.6	229.3	1,642.2	1,991.6	1,595.3	776.5	27.1	8,118.9
2005	1,256.1	999.3	39.6	281.9	2,382.9	3,548.4	1,942.4	916.5	40.1	11,407.2

Source: Malaysia Economic Statistics-Time Series (2007)

#### 2.4.4 Number of Registered Professionals

In total, there were 32,750 persons registered under professional services in 1986 and 117,652 persons in 2006, an increase of 259.2% growth two decades (see Table 2.8). It is interesting to note that engineering consultancy services which were only the fourth biggest in term of number of persons engaged, had the biggest number of registered professionals in professional services (i.e. 47.4%) from 1986-2006 inclusively.

Table 2.8: Number of Registered Professionals 1986-2006

Year	Number of Registered Professionals By Ethnic Group									Total
	Accounting Services	Architectural Consultancy Services	Drafting Consultancy Services	Dental Services	Medical Services	Engineering Consultancy Services	Legal Services	Surveying Consultancy Services	Veterinary Services	
1986	3,791	1,262	378	1,412	5,394	16,053	2,987	940	533	32,750
1987	3,904	1,234	346	1,488	5,794	16,697	3,334	1,023	582	34,402
1989	5,340	1,306	332	1,646	6,577	19,769	3,958	1,241	650	40,819
1991	5,895	1,455	330	1,714	7,198	22,094	4,801	1,621	701	45,809
1992	6,419	1,599	313	1,573	7,719	22,990	-	1,309	708	42,630
1994	7,740	1,815	310	1,870	8,831	25,641	-	1,852	807	48,866
1996	10,038	2,354	307	1,932	10,196	28,950	5,865	1,939	796	62,377
1999	13,661	2,903	-	2,127	12,141	35,491	8,879	2,061	961	78,224
2001	17,041	3,117	-	2,225	13,007	39,018	10,284	2,360	1,128	88,180
2002	18,371	3,224	-	2,297	13,377	41,762	10,688	2,480	1,167	93,366
2003	19,761	3,338	-	2,418	13,869	44,284	12,337	2,726	1,232	99,965
2004	21,124	3,415	-	2,550	13,377	47,875	12,961	2,841	1,333	105,476
2005	22,311	3,292	-	2,743	15,574	51,607	13,479	2,982	1,380	113,368
2006	22,406	3,173	-	2,998	15,574	55,175	13,705	3,177	1,444	117,652

Source: Yearbook of Statistics Malaysia (1986, 1987, 1988, 1990, 1991, 1992, 1994, 1996, 1999, 2002, 2003, 2004, 2005, 2006, 2007)

## 2.5 Civil Engineering in Malaysia Engineering Sector

Among all 86 disciplines listed by the Board of Engineers Malaysia (BEM), civil engineering, electrical engineering and the mechanical engineering have been among the biggest. In terms of the number of professional engineers, civil engineering was the largest discipline with 6,285 persons in 2005 and 6,891 persons in 2008. Electrical engineering was the second largest with 2,477 persons in 2005 and 2,710 persons in 2008. The third largest was mechanical engineering which recorded 2,415 persons in 2005 and 2,664 persons in 2008.



As with the number of professional engineers, the civil engineering discipline recorded the largest in terms of number of graduate engineers. Graduate civil engineers numbered 14,997 in 2005 and 17,542 persons in 2008. Unlike professional engineers, graduate engineers in mechanical engineering exceeded those in electrical engineering. Graduate mechanical engineers numbered 8,316 persons while graduate electrical engineers only recorded 5,528 persons in 2005. Graduate mechanical engineers remained the second largest group with 10,028 persons while graduate electrical engineers recorded 6,787 persons in 2008.

Table 2.9: Number of Professional Engineers

	2005	2006	2007	2008
Civil	6,285	6,447	6,522	6,891
Electrical	2,477	2,540	2,570	2,710
Mechanical	2,415	2,482	2,524	2,664
Total	12,331	12,655	12,817	13,523

Source: Board of Engineers Malaysia

As shown in Table 2.9, professional civil engineers dominated 51% of total number of professional engineers from 2003 to 2008. Graduate civil engineers also dominated 38% of total number of graduate engineers from 2003 to 2008 (see Table 2.10).

Table 2.10: Number of Graduate Engineers

	2005	2006	2007	2008
Civil	14,887	15,690	16,169	17,542
Electrical	5,528	6,088	6,207	6,787
Mechanical	8,316	8,834	9,101	10,028
Total	38,421	41,218	42,583	46,719

Source: Board of Engineers Malaysia

## **2.6 Liberalisation of Services Sector**

Liberalisation of the services sector is currently being undertaken by the WTO (through General Agreement on Trade in Services (GATS)), the ASEAN (ASEAN Framework Agreement on Services (AFAS)), and Malaysia (regional and bilateral free trade agreements (FTA)).

The WTO was established on 1 January 1995 and replaced the General Agreement on Tariffs and Trade (GATT) following the conclusion of the Uruguay Round of trade negotiations in 1994. Malaysia was the founder member of the WTO by virtue of its membership in the GATT since 1957. While the GATT established rules for trade in goods, the WTO also encompasses other trade-related areas such as services and intellectual property rights (Malaysia International Trade and Industry, 2003). Services negotiations in the WTO covered by the GATS. The GATS contains a set of multilateral rules covering international trade in services such as professional, financial, transport, communications, construction and distribution services. The main objectives of GATS were increased transparency and predictability of rules and regulations on trade in services; and promote progressive liberalisation in services through successive rounds of negotiations. One of the most obvious gains from GATS was more predictable services trading and investment environment. Exporters of services will no longer be at the whim of government policies that benefit domestic service suppliers (Malaysia External Trade Development Corporation, 2004). Besides this, service exporters will gain easier access to information about other market characteristics, such as regulations and barriers to trade, as countries are required to be more transparent about market access. Importantly, service exporters will reap the benefits of mutual recognition of professional credentials,