

APPENDIX 1 THE NATURE OF BUSINESS

Service providers need to secure spectrum to provide wireless network services. The capability and capacity of each service provider in providing wireless network services depend on their allocated spectrum and their technological adaptability. Thus, telecommunications companies face constraint on their maximum switching capacity. (Koshi and Majumdar, 2002)

Switching Capacity & The Peak-Load Pricing

Switching capacity refers to the ability of a service provider in connecting one call to another that is built in to the nature of spectrum and their technological investments. This switching capacity is not transferable as the extra capacity is sitting idle during the off peak period. In order to use efficiently the switching capacity, service providers who face different demand curves at different times of the day, have to charge a higher price during the 'peak' and a lower price for the 'off-peak'. The mobile phone billing system captures the opportunity cost of the switching capacity, using the 'peak-load' pricing¹. Service providers practice price discrimination, by offering different plans for different category of users. Table A and table B provide a cross section comparison of the available plans and their charges on both prepaid and postpaid services, offered by the mobile service providers in Malaysia.

In the postpaid segments, we noticed that when the monthly access fee is lower, the call rates will normally be higher; and vice-versa. Besides, the 'peak-hours' of the

¹ "Microeconomics Theory & Applications", Edgar K. Browning and Mark A. Zupan, John Wileys & Sons, 2002, p345.

postpaid segment covers from 7.00 am to 7.00 pm. Then, from 7.00 pm to the next morning 7.00 o'clock is the 'off-peak hours'.

In the prepaid sector, service providers that do not impose the network reload charges will charge at higher call rates. From the following table, we found that only 'Celcom-Excel' package charges the network reload charges. The airtime reload is available at RM50.00, RM100.00 and RM200.00. On the other hand, other prepaid plans charge the mobile phone subscribers based on the total amount of usages for mobile services. DiGi Prepaid and Time cel Prepaid set the 'peak hours' to start at 7.00 o'clock in the evening to 12.00 noon next day. On the other hand, the 'off-peak hours' starts at 12.00 noon to 7.00 pm. . TM Touch defines difference time period for the 'peak hours' and the 'off-peak hours'. Maxis charges calls made during 10.00 am to 12.00 midnight at 'peak-hours' rate, whereas, from 12.00 midnight to 10.00 am and 12.00 midnight to 5.00pm on Sunday, at 'off-peak hours' charges. Celcom prepaid packages charge calls made between 7.00 am to 11.59 pm at 'peak-hours' rates; from 12.00 midnight to the next morning 7.00 o'clock at 'off-peak hours' rates.

The purpose of adopting a peak load pricing system is to distribute the telephone usages more efficiently when there is limited supply of the switching capacity. As consumers are charged based on the amount of time they use in mobile telecommunications, the framework, structure and effects of 'peak-load pricing' policy are further strengthened when the retail consumers respond by shifting their consumption between the two periods due to the rates discrimination. Given the two distinct prices for both periods, rational consumers will adjust their calling behavior

accordingly by reducing usage when the cost is high and increase the usage only when it is less expensive.

Looking the peak-load pricing and the purpose of the consumers' usages, we can differentiate mobile phone users into business and retails consumers. Business consumers refer to those who use mobile services to enhance their productivity and performance whereas retail consumers use mobile phone services mainly for personal consumption. Thus, most of the total uses take place during normal working hours (the peak periods) and are mainly attributed to business activities. On the other hand, residential uses are mainly in the evenings.

Table A1.1 Postpaid Plans

	Maxis				Celcom		
	Standard Plan	M-style		M-world	ART900(010)	Right Choice	GSM(019) Call Plan 50
		RM138 package	RM238 package	RM500	RM1000		
Deposit (Malaysian/non Malaysian)	RM300	RM300	RM300	RM600	RM1200	RM100	RM100
Connection Fee	RM50	RM50	RM50	RM50	RM50	RM50	RM50
Monthly access fee	RM60	-	-	-	-	RM300(for 1st year) RM60(subsequently)	-
Service Tax	RM3	5%	5%	5%	5%	5%	5%
Stamp Duty	RM10	RM10	RM10	RM10	RM10	RM10	RM10
Fixed Monthly Payment	RM10	RM 138	RM 238	RM500	RM1000		
Type of call							
Peak	(7am - 7pm)	(7am - 7pm)	(7am - 7pm)			(7am - 7pm)	(7am - 7pm)
Local Area	RM0.30/min	RM0.30/min	RM0.30/min			RM0.30/min	RM0.50/min
Adjacent Regional	RM0.80/min	RM0.80/min	RM0.80/min			RM0.80/min	RM1.00/min
Non Adjacent Regional	RM1.50/min	RM1.50/min	RM1.50/min			RM1.50/min	RM2.00/min
East Malaysia to Singapore	RM3.00/min	RM3.00/min	RM3.00/min				
All calls within Malaysia							
B to Singapore							
West Malaysia to Singapore							
Off Peak							
Local Area	(7pm - 7am)	(7pm - 7am)	(7pm - 7am)			(7pm - 7am)	(7pm - 7am)
Adjacent Regional	RM0.15/min	RM0.30/min	RM0.15/min			RM0.15/min	RM0.50/min
Non Adjacent Regional	RM0.40/min	RM0.40/min	RM0.40/min			RM0.40/min	RM1.00/min
East Malaysia to Singapore	RM0.75/min	RM0.75/min	RM0.75/min			RM0.75/min	RM2.00/min
All calls within Malaysia	RM1.50/min	RM1.50/min	RM1.50/min				
B to Singapore							
West Malaysia to Singapore							
IMS Peer to Peer	RM0.15	RM0.15	RM0.15			RM0.15	RM0.15
IMS to Other service provider	RM0.15	RM0.15	RM0.15			RM0.20	RM0.20
Voice Mail							
International Roaming							
DD							
Rewards/discount							
	Local call charges Depend on country Depend on country 1) Stay and get RM30 rebate. 2) Monthly charges is RM150 and above rebate RM10.	Local call charges Depend on country Depend on country 1) Stay and get RM30 rebate. 2) Monthly charges is RM150 and above rebate RM10.	Local call charges Depend on country Depend on country 1) Stay and get RM30 rebate. 2) Monthly charges is RM150 and above rebate RM10.	Local call charges RM0.15 RM0.15 Local call charges	Local call charges RM0.15 RM0.15 Local call charges	Local call charges Depend on country Depend on country 1) Total bill RM50 to RM149.99, RM10 rebate 2) Total bill RM150 to RM249.99, RM25 rebate 3) Total bill RM250 and above, RM40 rebate	Local call charges Depend on country Depend on country 1) Total bill RM50 to RM149.99, RM10 rebate 2) Total bill RM150 to RM249.99, RM25 rebate 3) Total bill RM250 and above, RM40 rebate

Table A1.2

Prepaid Plans

	Maxis Hotlink Prepaid	Celcom Prepaid			Digi Prepaid Plus
		Explore	Exceed	Excel	
Deposit/Simcard (RM)	88	48	128	168	68
Connection fee (RM)	0				0
Network reload				RM50 for 30 days RM130 for 90 days	
Monthly access fee (RM)	0				0
Type of top-up vouchers	1) RM 60 for 1.5 month 2) RM 100 for 3 months	1) RM50 for 50 days 2) RM100 for 100 days 3) RM200 for 200 days	1) RM50 for 50 days 2) RM100 for 100 days 3) RM200 for 200 days	Airtime reload available at RM50, RM100 and RM200	1) RM 30 for 1 month 2) RM 50 for 1.5 month 3) RM 100 for 3 months
Charges (RM)					
Peak	10am - Midnight		7am - 11.59pm		7.00pm - 12.00 noon
Local Area	\$ 0.60/min	\$0.58/min	\$0.45/min	\$0.30/min	\$0.60/min
Adjacent Regional	\$ 1.40/min	\$1.50/min	\$1.40/min	\$0.80/min	\$1.20/min
Non Adjacent Regional	\$ 2.60/min	\$2.70/min	\$2.60/min	\$1.50/min	\$1.80/min
Off-peak	Midnight - 10am, Sun Midnight - 5pm		12midnight - 6.59am		12.00 noon - 7.00pm
Local Area	\$ 0.30/min	\$0.38/min	\$0.45/min	\$0.15/min	\$0.40/min
Adjacent Regional	\$ 0.70/min	\$0.90/min	\$1.40/min	\$0.40/min	\$0.80/min
Non Adjacent Regional	\$ 1.30/min	\$1.80/min	\$2.60/min	\$0.75/min	\$1.20/min
SMS peer to peer	\$ 0.15 per message	\$ 0.15 per message	\$ 0.15 per message	\$ 0.15 per message	\$ 0.20 per message
SMS to other operators	\$ 0.15 per message	\$ 0.20 per message	\$ 0.20 per message	\$ 0.20 per message	\$ 0.20 per message
Voice Mail	RM0.30	local call charges	local call charges	local call charges	local call charges
IDD	Std IDD + RM 0.30			No IDD Surcharge	

Table A1.2 (Continued...)

	TM Touch Advance-local	TM Touch Advance-Nation	TM Touch INTM	TIMECel Prepaid
Deposit/Simcard (RM)	58	58	58	168
Connection fee (RM)	0	0	0	0
Network reload				
Monthly access fee (RM)	0	0	0	0
Type of top-up vouchers	1) RM 50 for 1.5 month 2) RM 100 for 3 month	1) RM 50 for 1.5 month 2) RM 100 for 3 month	1) RM 50 for 1.5 month 2) RM 100 for 3 month	1) RM 30 for 1 month 2) RM 50 for 2 months 3) RM 100 for 3 months
Charges (RM)				
Peak	7.00pm - 6.59a.m. \$0.54/min	7.00pm - 6.59a.m. \$0.66/min	(12.00pm - 11.59pm) \$0.60/min	(7.00pm - 12.00 noon) \$0.51/min
Local Area	\$1.19/min	\$1.07/min	\$1.20/min	\$1.20/min
Adjacent Regional	\$2.10/min	\$2.04/min	\$2.40/min	\$1.20/min
Non Adjacent Regional				
Off-peak	7.00am - 6.59pm \$0.39/min	7.00am - 6.59pm \$0.51/min	(12 Mid - 11.59am) \$0.48/min	(12.00 noon - 7.00pm) \$0.39/min
Local Area	\$0.79/min	\$0.67/min	\$0.96/min	\$0.84/min
Adjacent Regional	\$1.41/min	\$1.29/min	\$1.92/min	\$0.84/min
Non Adjacent Regional				
SMS peer to peer	\$ 0.15 per message	\$ 0.15 per message	\$ 0.15 per message	\$ 0.15 per message
SMS to other operators	\$ 0.20 per message	\$ 0.20 per message	\$ 0.20 per message	\$ 0.15 per message
Voice Mail	\$0.30	\$0.30	\$0.30	
IIDD				

Last Updated July 15, 2003

APPENDIX 2 MOBILE TELECOMMUNICATIONS TECHNOLOGIES

Due to the immense demand for Internet services using mobile communication, an enhanced mobile telephony service with more advanced technology is required. GPRS(General Packet Radio Service) is then introduced to overcome this lack. This is the combination of GSM and Internet protocol technologies for data transfer that allows network to send 'packet of data' at a faster rates; capable of handling data transmission up to 115 kbps. GPRS is also known as 2.5G technology.

Then comes the broadband and packet-switched technologies, known as third generation(3G) technology. 3G offers a high capacity, high data transmission rate, real time video streaming and many more features. It can transmit data between 144 kbps and 2mbps¹. It combines features of mobile communications, internet access and mobile computing, thus serving a broad array of services, including voice, data, audio, and video applications. The 3G technology is also known as UMTS in Europe. Due to enormous investment shrouded with uncertainty in expected return, many developing markets have yet to roll into this technology.

Malaysia adopted the Wideband Code Division Multiple Access(W-CDMA) transmission standard for 3G.² In view of the spectrum scarcity, the Commission announced an invitation to the bid of three blocks of 3G spectrums on the basis of a 'beauty contest'. Competitive bidding generates substantial revenues for the government and also comparative information about the spectrum price for scarcity.

¹ Maxis Annual Financial Report Year 2001, p177 – 179.

² International Telecommunications Union has established the IMT-2000 as the global standard for 3G. There are two major transmission technologies: Wideband Code Division Multiple Access(W-CDMA) and Code Division Multiple Access(CDMA2000). W-CDMA evolved from the GSM transmission technology, whereas CDMA2000 evolved from CDMA One standard. (Maxis financial report)

Malaysia Communications and Multimedia Commission(MCMC) successfully awarded Maxis Communication Bhd and Telekom Malaysia Bhd 3G licenses with conditions. However, Celcom(M) Bhd, eTouch Sdn Bhd and TIME Sdn Bhd all failed in their tenders. The successful bidder will be granted a 2 X 15 Mhz block of spectrum for 15 years at the price of RM50 millions.³ It is believed that with 3G spectrums, operators will be able to provide a seamless transition for the consumers, which is expected to roll out at the end of 2003.

³ "3G allocation signals telco industry consolidation", Monday, 12 November 2001.
<http://www.theedgedaily.com>

APPENDIX 3

Questionnaire for study on "Churning in the Mobile Telecommunications Industry"

The data collected from this questionnaire will be used to study why mobile phone subscribers switch their mobile phone service providers. All information collected will be confidential. Only aggregated data will be published.

A. PERSONAL DETAILS

(Please tick on the column that is the most appropriate in describing you)

1. Your age is : _____

2. Sex :

Male ☐
Female ☐

3. Race:

Malay ☐
Chinese ☐
Indian ☐
Others* ☐

4. Marital Status

Single ☐
Married ☐
Others* ☐

* include divorce/married but separated

Please specify

5. What is your education level?

No Education ☐
Primary School ☐
Secondary School ☐
College / University ☐
Others* ☐

* Please specify

6. What is your occupation?

Clerical/Administrative ☐
Technician ☐
Sales/Service Executive ☐
Professional ☐
Manager/Director ☐
Others* ☐
Pls specify _____

7. Which sector/industry are you working in?

Manufacturing ☐
Transportation ☐
Building ☐
Service ☐
Education ☐
Others* ☐

* Please specify

8. Your Gross monthly income is:

RM: _____

(If interviewee is reluctant to disclose his income, please prompt for a range e.g. between RM1,000 and RM2,000)

9. Do you have fixed-line phone at home?

Yes, I do ☐

No, I don't ☐

If YES,
Are you paying for it?

Yes ☐

No ☐

10. Do you have fixed-line phone at office?

Yes, I do ☐

No, I don't ☐

If YES,
Are you paying for it?

Yes ☐

No ☐

B. MOBILE PHONE USAGE

1. How long have you been using mobile phones?

_____ years _____ months

2. Which of the following mobile services are you CURRENTLY using? (Tick one or more)

	Postpaid	Prepaid		Postpaid	Prepaid
Celcom (019)	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	TM Touch (013)	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
Digi (016)	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	Time Cel (017)	(7) <input type="checkbox"/>	(8) <input type="checkbox"/>
Maxis (012)	(9) <input type="checkbox"/>	(10) <input type="checkbox"/>			

3. How long have you been with the CURRENT mobile service provider?

_____ years _____ months

4. Why did you sign-up with your current mobile service provider?

Attractive pricing ☐

Recommendation from hand phone dealer ☐

Recommendation from friends ☐

Others: _____ ☐

5. Please state the INITIAL amount of money you have paid for the above services:

(a) Deposit: RM _____

(b) Registration: RM _____

(c) Others: RM _____
()

6. Your mobile is mainly used for:

Mostly Personal

☐

Mostly Business

☐

Both Equally

☐

7. On Average, how many number of calls do you RECEIVE in a day? _____ calls

8. On Average, how many number of calls do you MAKE in a day? _____ calls

9. In a day, on average, how much time do you spend on mobile phone conversations?

_____ minutes

10. What type of additional services are you using under the CURRENT mobile services provider(s)?

SMS

☐

Voice Mail

☐

IDD

☐

International Roaming

☐

Others:

☐

11. Are you paying for the mobile phone SERVICES you are currently using?

Yes

☐

No *

☐

* If No, please state the person paying for it:

12. What is your average monthly bill for mobile services?

RM _____

C. CHANGE IN MOBILE SUBSCRIBER

1. Have you ever switched mobile phone service provider?

Yes

☐

How many times have you switch? _____ times

No

☐

(If No, go to question 4 in this section)

2. If you have switched mobile service providers before, which is the previous service provider?

	Postpaid	Prepaid		Postpaid	Prepaid
Celcom (019)	(1) <input type="text"/>	(2) <input type="text"/>	TM Touch (013)	(5) <input type="text"/>	(6) <input type="text"/>
Digi (016)	(3) <input type="text"/>	(4) <input type="text"/>	Time Cel (017)	(7) <input type="text"/>	(8) <input type="text"/>
Maxis (012)	(9) <input type="text"/>	(10) <input type="text"/>			

3. What is your average monthly bill with the previous mobile phone service provider?

RM

4. What is the reason(s) for switching your mobile phone service provider?

Price	<input type="text"/>
Service Reliability	<input type="text"/>
Clear Signal	<input type="text"/>
Others:	<input type="text"/>
<input type="text"/>	

5. Are there any reasons why you have not switched your mobile phone service provider in the past?

Satisfied with existing provider	<input type="text"/>
Too costly to switch:	<input type="text"/>
Why? <input type="text"/>	
Others:	<input type="text"/>
<input type="text"/>	

6. Do you intend to switch to another mobile phone service provider in the next 6 months?

Yes*	<input type="text"/>	* I intend to switch to <input type="text"/>
No	<input type="text"/>	

7. State your reason(s) for your intention to switch mobile phone service provider in the next SIX months.

Price	<input type="text"/>
Service Reliability	<input type="text"/>
Clear Signal	<input type="text"/>
Others:	<input type="text"/>
<input type="text"/>	