

# **Case studies of Malaysia, Pakistan and Brazil on mobile termination charge**

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# 1 Case Study of the mobile IUC regime in Malaysia

## Market Background:

The end of period mobile penetration in Malaysia in 2005 stood at around 75%. The market was growing steadily and had shown a significant growth in penetration from 57% in 2004 to 75% in 2005 (End of Period). The market was duopolistic in nature with two dominant operators and a smaller third operator. Maxis Communications, was the market leader with around 40% market share closely followed by Telekom Malaysia with 35% market share. The smaller operator DiGi had a market share of around 25%. The market was also characterised by a significant Urban-Rural divide in terms of mobile penetration. In 2005 the rural mobile penetration was only 12% while the urban penetration was at 50%. The market also had a high share of prepaid subscriber base of around 85% in 2005.

## Evolution of Interconnection regime and MTC:

Interconnection arrangements including interconnection charges between operators in Malaysia are currently governed by the Access Regime under CMA 1998 and the ensuing interconnection agreements (ICAs) signed between the respective parties. In a seminal effort to establish the Access Regime under CMA 1998, Malaysian Communications and Multimedia Commission (MCMC), the regulator, issued a new Mandatory Standard on Access Pricing, effective from 1st July 2003. The Mandatory Standard sets out the maximum standard prices for fixed network origination/termination services and mobile network origination/termination services in the form of 24-hour weighted average prices which will be fixed until 2005. The costing methodology used was closer to FAC for fixed services, using Telecom Malaysia's fixed network as proxy to nationwide fixed network and was closer to LRIC for mobile services, using Celcom's mobile network as proxy for nationwide mobile network.

Subsequently, MCMC reviewed the termination rates and issued a new Mandatory Standard on Access Pricing, effective from 15 Feb 2006 (to 31 Dec 2008) with new maximum prices for the said interconnection services as well as other (including additional) services. The costing methodology used is total service LRIC.

The evolution of the interconnection regime and methodology adopted is shown in Exhibit 1.

Year	Interconnection Charging Arrangement	Costing Methodology	Instrument
1990 – 1998	Sender Keeps All (SKA) and Revenue Sharing	-	Commercial Negotiation
1998 – June 2003	Benchmark prices based on cost	Closer to long-run incremental cost (LRIC) for mobile  Closer to fully allocated cost (FAC) for fixed	Determination of Cost-based Interconnect Prices and the Cost of Universal Service Obligation (TRD 006/98)
1 Jul 2003 – 15 Feb 2006	Maximum prices based on cost	Total service LRIC (TSLRIC)	Commission Determination on the Mandatory Standard on Access Pricing
15 Feb 2006 – 31 Dec 2008	Maximum prices based on cost	TSLRIC	Commission Determination on the Mandatory Standard on Access Pricing, Determination No. 1 of 2006

Pursuant to the Public Access Pricing inquiry, MCMC has increased the MTC in Malaysia gradually from US 2.12 cents in 2006 to US 2.55 cents in 2008 (Refer Exhibit 1).

The key features of the costing methodology and principles used are listed below:

- Factors taken into account when regulating prices

On the decision of regulating the prices, factors such as barriers to market entry, whether the market is moving to competition, were taken into account by the regulator

- Mobile interconnection cost based on theoretical operator

MCMC attempted to cost mobile interconnection based on factors such as market share (traffic volume) and spectrum allocation. However, at the end, MCMC decided to adopt a theoretical network based on 33% market share as competition will eventually lead to 33% market share each (fair share between three players); and incorporating time for nationwide roll-out

- Peak and off-peak charges

MCMC replaced peak and off-peak charges with a 24-hour weighted average

- New interconnection services

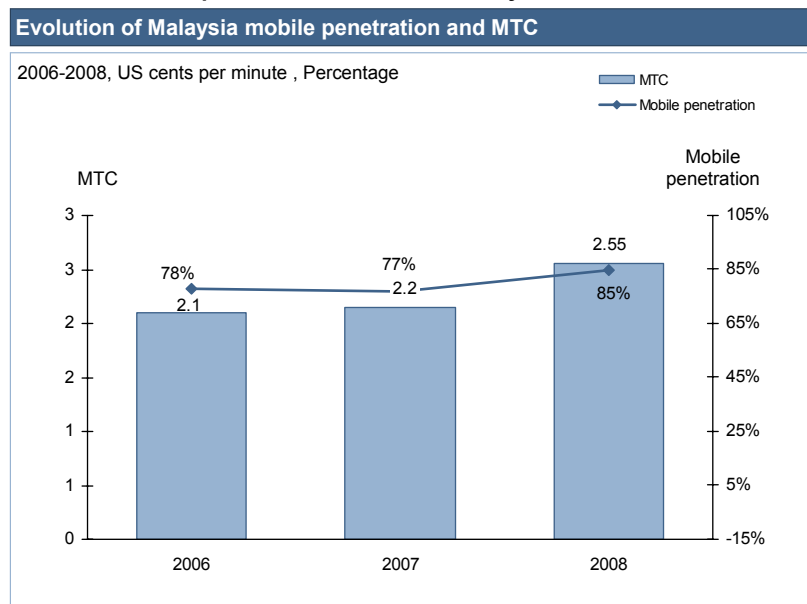
Currently, 3G voice termination follows 2G voice termination. The regulator opined that inclusion of 3G expenses in the LRIC calculation might distort incentives to efficient migration from one platform (2G) to the other (3G), and introduce in the market undesirable cross-subsidization. Moreover, 3G networks are still quite new and innovative, making LRIC modeling results less reliable as a basis for forward-looking policy.

- Cost elements considered in costing exercise

CAPEX (Passive, active and transmission links), OPEX (Fixed and variable) and common costs (Personnel, General administration) were considered. Depreciation, cost of capital (WACC - 12.24%), indirect shared and common fixed costs (mark-up to LRIC) were also included in the cost elements considered.

Moreover, MCMC is of the opinion that rural roll-out costs are mandated by factors external to operators, and hence should be regarded as an unavoidable cost and should thus be included in the LRIC cost.

**Exhibit 1: Evolution of mobile penetration and MTC in Malaysia**



Source: MCMC, SVP analysis

**Key considerations from Malaysia case study:**

- Consistently used LRIC methodology and the review in 2005 was based on a theoretical efficient operator
- The regulator has adopted an approach of reviewing the MTC on a regular basis every 3 years
- In the last review of 2005, the MTC for 2006 has been further reduced from 2005 levels. However the regulator has mandated an increasing trend in MTC for 2006 to 2008. In determining the increase, the regulator has considered the network expansion costs incurred by operators to improve cellular coverage across the country particularly in less affluent areas. More specifically the LRIC model developed considers the rural expansion costs incurred by operators recognizing that these less affluent areas would offer the greatest potential for mobile telephony growth in the future
- Malaysia has thus used an increasing MTC for a defined time frame as a tool to encourage operators to expand their services particularly in rural areas

## 2 Case Study of the Mobile IUC regime in Pakistan

### Market background:

The Pakistan mobile market has shown a healthy growth with 15% in 2005 to 52% in 2008. The market is characterized by the presence of a significant market power. PMCL is the largest operator in the country which had a market share of 46% in 2007. Some of the smaller operators include Ufone (PTML) with 20% market share Warid telecom with 17% market share and Telenor with 13% market share.

### Evolution of interconnection regime and MTC:

Following are the guiding principles adopted by the telecom regulator for the interconnection regime in Pakistan:

1. Interconnection and related services shall be provided on the basis of unbundled network elements and charged accordingly. A requesting operator shall only pay for the network components or facilities of the interconnection that requires it.
2. Charges for interconnection services shall be cost oriented
3. Cost of inefficiencies of an operator should not be passed on to other operator through higher interconnection charges; and
4. Interconnection arrangement should encourage efficient and sustainable competition

In 2005, the regulator requested the then four operators i.e. Paktel, Instaphone, Mobilink and Ufone to work out their MTC using fully allocated costs (FAC) methodology. However the authority noted that its ultimate objective was to move towards a LRIC based costing methodology in a phased manner and considered the use of FAC as a transitory phase. The Authority also used international benchmarks to validate the costs that were submitted by the various operators. The authority determined the MTC, based on a weighted average of the costs submitted by the operators on the basis of number of subscribers for each operator. The mobile termination rate was determined as Rs. 1.6 for the period 1<sup>st</sup> August 2005 to 30<sup>th</sup> June 2006 on this basis. It was also determined that the termination rate would be reduced to Rs. 1.25 from July 2006 to June 2008.

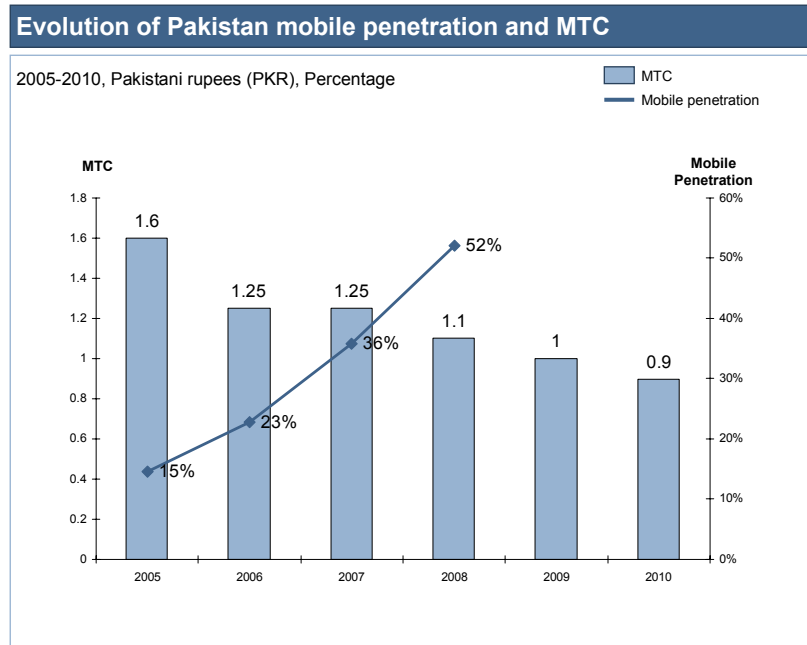
In 2008, the authority adopted a bottom-up LRIC approach to determine the level of interconnection for the both fixed incumbent and mobile operators. In addition the authority continued to use international benchmarking to cross check if the results obtained from the costs model are broadly in range. The following were the key principles on which the LRIC modelling was based:

- The model was based on hypothetical operator.
- Cost elements used included CAPEX (TRX, BTS, BSC, MSC, transmission links etc.), OPEX (site rentals, leased line charges etc.) and common cost mark ups.
- Depreciation was calculated based on tilted annuity methodology
- Equi proportional mark up (EPMU) was used to allocate common costs
- Capital recovery was included by calculating the WACC for the theoretical operator
- Routing table was used to allocate the costs to the various services

Based on the outputs of the LRIC model the mobile termination charge was set at Rs. 1.1 for the period from June 2008 to 31<sup>st</sup> Dec 2008. The authority also set a MTC glide path and determined that MTC would be

further revised to Rs. 1.00 in the period from Jan 2009 to Dec 2009 and would finally remain constant at Rs. 0.90 from Jan 2010. The Exhibit 1 indicates the evolution of the MTC from 2005 to 2010 and the evolution of penetration from 2005 to 2008.

**Exhibit 4: Evolution of mobile penetration and MTC in Pakistan**



**Key considerations from Pakistan study:**

- The Regulator adopted cost based methodology and used both a FAC and a LRIC methodology. FAC was used in the transitory period before moving to a LRIC methodology
- The LRIC model was built using the globally accepted best practices in cost modelling
- International benchmarks were used to validate the outputs of the cost model

### 3 Case Study of the Mobile IUC regime in Brazil

#### Market background:

The mobile penetration in Brazil has evolved steadily growing from 36% in 2004 to reach 65% in 2007. The market is characterised by heavy competition with 4 major players and 3 smaller players. Vivo is the clear market leader which had around 30% market share in the end of 2007. This is followed by the medium scale operators like TIM Brazil (26%), Claro (25%) and Oi (14%). The smaller operators had a combined market share of only around 5%. The market is also characterised by a high proportion of pre-paid subscriber base (around 80%) and a low ARPU.

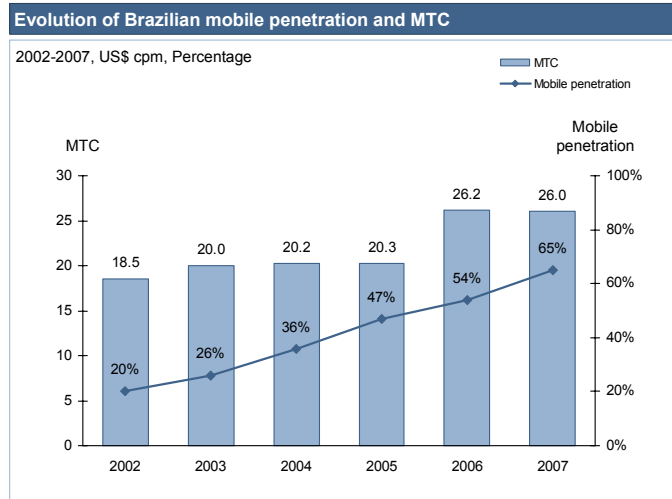
#### Evolution of interconnection regime and MTC:

In 2002, regulations for the Personal Communications System (PCS) were introduced in Brazil. As regards the interconnection on the mobile network, these acts pointed to a deregulation of the setting of access charges, allowing the charges to be set by agreement between the fixed and mobile networks. For calls between different mobile networks, in the period 2002 to 2005 a *partial Bill and Keep* system was adopted in which only operators with traffic imbalance (traffic ratio exceeding 45/55) pay for access. After 2005, the *full Bill and Keep* system was to be adopted and no payments for interconnection were supposed to be made. After ANATEL, the regulator, failed to reach an agreement with MNOs on interconnection rates, the proposed full Bill and Keep system implementation was postponed.

The final change on the regulatory structure is currently under discussion. By the end of 2004, ANATEL put forward a proposal for a new General Regulation of Interconnection, including termination on both the fixed and the mobile networks. On this regulation a new asymmetric regulation structure is also put in place, in which some operators are designed as having Significant Market Power (SMP), with access prices to be set by the regulator. Those considered as not having SMP are expected to have its access charges as determined by negotiation. The mobile termination charge for those considered to have SMP was to be set by the Fully Allocated Cost method, while the fixed termination was to be determined by the Long Run Incremental Cost (LRIC) method. **The Regulator has commenced the process for moving towards a LRIC costing methodology and has invited the operators to submit relevant cost data for the same. It is expected that by 2011, the transition to LRIC will be completed.**

The following exhibit details the increase in mobile termination charge and the simultaneous increase in mobile penetration.

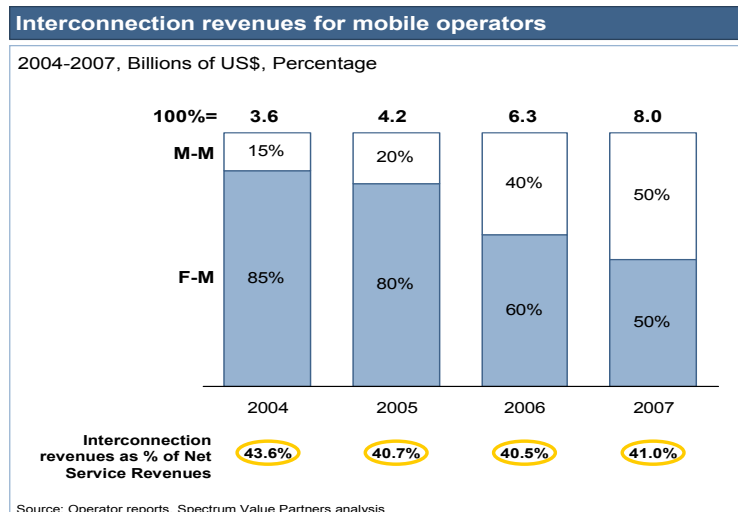
**Exhibit 1: Evolution of Brazilian mobile penetration and MTC**



Source: Ovum, SVP Brazil analysis

Even though fixed line penetration in Brazil is just 21% (2007), 50% of interconnection revenues emanate from fixed-mobile calls (Refer Exhibit 2). This is primarily driven by high proportion of pre-paid customers) who use mobile connections mainly for receiving calls and thus generate very low ARPU (less than US\$ 4 per month).

**Exhibit 2: Breakdown of interconnection revenues for mobile operators in Brazil**



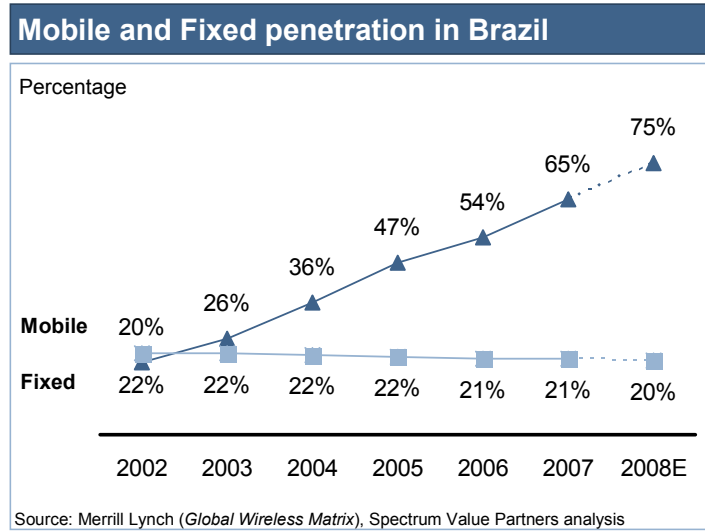
Source: Operator reports, Spectrum Value Partners analysis

In this market, mobile operators depend heavily on MTC as 40% of their net service revenues are from interconnection charges.

In Brazil, the regulator has decided not to reduce the interconnection charges in order to accelerate the development of the mobile market. This is evident from increase in mobile penetration in Brazil (Refer Exhibit 3). A favourable interconnection regime has thus played a major role in ensuring the growth of the prepaid mobile service particularly in semi-urban and rural areas, as revenues stemming from it have made it possible

for operators to provide services to more users who are not financially able to subscribe to the post paid service. A reduction in MTC will force the operators to increase tariffs to ensure marginal profitability in providing mobile services to the pre-paid customers. This potential impact is also highlighted by an econometric study conducted in Europe, which has concluded empirically that a 10% reduction in MTC has resulted in an increase of ~10% in tariffs<sup>1</sup>.

**Exhibit 3: Evolution of mobile and fixed penetration in Brazil**



**Key considerations from Brazil case study:**

- Regulator has adopted a cost based methodology (FAC) to set the MTC for the operator which has a significant market power
- Due to the presence of large proportion of prepaid users in the market, MTC forms an important source of revenue for the mobile operators
- A reduction in MTC could lead to higher tariffs as operators try to ensure marginal profitability. In a market with a proportion of prepaid users this could hamper growth. The regulator has hence used MTC as a tool to develop the mobile market by not reducing the termination charges.

<sup>1</sup> Source: Genakos and Valletta (2008): "Testing the 'Waterbed' Effect in Mobile Telephony," CEIS Tor Vergata, Research Paper Series, vol.6, Issue 2, No. 110