Mobile Number Portability in South Asia

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Abstract

Mobile Number portability (MNP), a feature present in most developed telecom markets around the world, is now making its way into the developing telecom markets of South Asia. Unlike the conditions that exist in the mature environments of the western world, however, market structures, pricing mechanisms and even customer phone use behaviours are vastly different in the emerging South Asian markets. As such, the preconditions necessary for the success of this service and its potential implications will be largely different in this region.

The paper explores Pakistan's experience in introducing MNP and will investigate the suitability of introducing the same in India and other emerging South Asian microstates such as the Maldives. The paper will also consider how phone subscribers at the Bottom of the Pyramid (BOP) and the impact of the low-cost, low-ARPU pricing model implemented in South Asia will affect porting rates. The study will be mainly based on secondary data collection (existing reports, market trends and opinions of key stakeholders) while the BOP data will be sourced from LIRNEasia's large sample study, teleuse@BOP3, carried out in six-countries in 2008.

Keywords: mobile number portability, preconditions, policy implications, Pakistan, India, Maldives.

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I.   Introduction

This paper investigates the benefits, costs and preconditions for mobile number portability (MNP), while questioning its suitability for implementation in emerging South Asia. MNP is a service that enables a mobile subscriber to switch operators while retaining his/her phone number.

Mobile subscribers incur switching costs when changing operators to take advantage of lower call rates and potentially better services. Several articles discuss the composition of switching costs and most suggest that it consists of the time and money expended in moving to a different operator, including having to inform contacts of a number change (Dick & Basu, 1994) and the loss of or having to give up a phone number (Buehler, Dewenter & Haucap, 2005). Such an action is perceived as a risk, both financially and psychologically (Dick & Basu, 1994, Murray, 1991). The imposition of contractual agreements and customer loyalty programs by mobile operators add to these switching costs. For business enterprises, the costs of switching operators and changing phone numbers are far greater. This is because they end up having to reprint business cards, sign boards and other paraphernalia on which their numbers are displayed, and websites have to be updated with the new contact information. They also risk losing business opportunities through missing calls from those who are unaware of their number changes (Smura, 2004; Beuhler & Haucap, 2003).

These costs, therefore, act as a barrier to changing operators by reducing the attractiveness of switching to better alternatives; the greater the switching costs, the more likely a subscriber will not move to another carrier (Gerpot, Rams & Schindler, 2001; Kim, Park & Jeong, 2004). For new operators in the mobile sector, high switching costs act as a barrier to winning over subscribers from competing networks; furthermore, operators have to offer tariffs low enough to outweigh the cost of switching networks (Haucap, 2003). As a result, Sutherland (2007) states that regulators have found it necessary to introduce MNP services, as they reduce switching costs and "facilitate consumer choice and ensure effective competition".

To date, number portability has been adopted in about 60 developed countries with mature telecom markets, including several developed Asian countries (Keynote Capitals, 2009). MNP was introduced

in the early part of 2000 in most of Europe and the USA, while Singapore was among the earliest countries to adopt the facility in 1997 (Buehler, Dewenter & Haucap, 2005). The first South Asian economy to have adopted the service has been Pakistan in 2006; and India is yet to do so.[2] Other emerging nations in the region have also considered the adoption of MNP but have not followed through for many a reason (Keynote Capitals, 2009).

Given its presence in the market for many years, it is clear that this type of service is hardly a new feature in the telecom industry. Local number portability, which facilitates porting from one local fixed operator to another while retaining the caller's phone number, was introduced as early as in the mid-1990s in Hong Kong, the US, Canada and Europe. In fact, there are several types of portability services that have been implemented across the world, including service, service provider and location-based/geographic portability (Smura, 2004; Lin, Chlamtac & Yu, 2003). Furthermore, while the most common application of number portability is between mobile to mobile and fixed to fixed markets in Europe, the USA provides subscribers with the opportunity to port between both fixed and mobile service providers (Smura, 2004).

Section II provides a discussion on the benefits and costs of MNP. Section III focuses on measuring the success of MNP. Section IV looks at the preconditions necessary for the implementation of MNP, including the minimum threshold market size. Section V focuses on the regulatory and policy implications of the service. An introduction to MNP in South Asia is provided in Section VI. Pakistan's experience of introducing MNP, as well as a discussion on the potential for implementing the same in India is found in Section VII. In Section VIII, the lessons for the South Asian region and the impact of Bottom of the Pyramid (BOP) subscribers on MNP and implications of Mobile 2.0 on MNP are analysed.

II.   The rationale for implementing MNP

Existing literature on portability contains extensive discussions on the rationale for introducing these services. Among the most commonly cited motives is the lowering of switching costs (Smura, 2004;

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[2] MNP is to be launched in select metros in India towards the latter part of 2009. This is discussed in more detail in Section VII.

Buehler, Dewenter & Haucap, 2005). Mobile customers' who switch operators in return for better quality of service (QoS) and/or call rates, are benefited by the MNP facility as they do not incur costs to update their networks about a number change. In addition, they are less likely to miss out on phone calls (except during the short period when the actual number porting from one operator to another takes place).

As discussed by Gerpot, Rams & Schindler (2001), customers put a value on their phone numbers, especially when they have used that number for an extended period of time, and would rather stay with an unsatisfactory service provider in an effort to retain that phone number. This in itself is a cost to the user, who has to put up with poor QoS and maybe even make calls at uncompetitive rates. The existence of portability, therefore, enables such customers to make a simple change to an operator of their choice as a result of lower switching costs.

It must be noted, however, that MNP cannot completely remove these costs – mobile subscribers will almost certainly incur some cost in switching operators, in terms of time taken to make the switch (it is possible that they may miss a few calls) and money spent on porting the number (the porting process involves a lot of technicalities, the costs of which must be covered by regulators and operators). However, these are one time costs, while the costs of a poor service and the compulsion to carry on may have huge implicit costs and may reduce consumer welfare.

Following from this discussion, the introduction of the MNP service is said to drive competition; it must be noted that the service does not create competition but only improves it. This is based on the theory of contestability which postulates that the threat of new entrants into a market alone should ensure that existing firms behave more competitively. As stated in Buehler, Dewenter & Haucap (2005, 1), "the rationale of introducing mandatory MNP is simple: it is expected to bring about considerable benefits to consumers of mobile services". MNP facilitates the movement of customers between service providers, putting the latter under pressure to provide greater levels of service. The introduction of MNP entails a rethinking of business strategies beyond price wars alone, which result in competitive tariffs among industry players (Buehler & Haucap, 2004), as they will not be enough to retain subscribers; instead, operators will have to improve their QoS and even offer innovative

services and features in order to prevent customers from changing networks. This is perceptibly beneficial to mobile subscribers (Katka, 2004), but operators have to undertake expensive marketing campaigns and advertising costs, and increase investment costs. The potential for high churn rates[3] and loss of subscribers adds to this pressure (Keynote Capitals, 2009). While MNP may have a significant impact on market dynamics, it is difficult to distinguish the absolute effect of the service on the market.

Another benefit from this service is that it helps to create a level playing field for small and new entrants (Katka, 2004). Market asymmetries will be removed to a certain extent; and every service provider is given the opportunity to attract customers regardless of how young or how established the operator is. MNP has effects on "retail prices, termination charges, price elasticities, market shares, as well as entry and investment decisions" (Buehler, Dewenter & Haucap, 2005).

While MNP is expected to reduce switching costs and increase competition among industry players, the extent of these effects is contingent on how accepting operators are to the introduction of MNP services. Service providers can engage in attempts to stifle the effects of MNP by penalizing subscribers' who break their contractual agreements or by imposing hefty charges for porting their numbers. Operators can even provide phones that are locked in to their own networks, making it difficult for subscribers to make a switch to another network, without having to purchase a new phone. Some are even guilty of suppressing information on porting. It is for these very reasons that the success of MNP is deemed by the power wielded by the regulatory and competition authorities. Such preconditions are discussed in further detail in Section 3.0.

The service also has implications on the reallocation of property rights (Buehler, Dewenter & Haucap, 2005), because subscribers become the sole owners of the mobile phone number that they hold, and therefore control its use. This increases the value of number or perpetuates a loyalty towards to number that a subscriber obtains.

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[3] Churn is the movement of customers between operators.

The MNP service also encourages churn, as mentioned above, which service providers generally strive to keep at a minimum. High churn rates are especially useful for new entrants into the mobile market, because they are able to acquire subscribers to their networks. MNP helps these firms to acquire new subscribers, but operators are faced with the task of having to retain their existing subscribers, which may sometimes be harder to do (Smura, 2004). Service providers have to take extra efforts to ensure that they do not lose their own subscribers while trying to entice subscribers from other networks to take up their services, and striking this balance can be tricky. There are, therefore, both positive and negative consequences to high churn rates.

On the other hand, there are several downsides to using MNP services. With the use of MNP customers will generally be oblivious to the network they are calling. In the past, operators have had a specific number code before the remaining numbers that comprise a phone number, in order to make it easy for callers to identify which network they are calling. With the use of MNP, however, this code serves very little purpose as it does not mean that a customer with such a code still belongs to the corresponding network. This, therefore, defeats the purpose of having such a code and has implications on national numbering plans (Ovum, 2000). Additionally, since mobile subscribers are most likely to be unaware of which network they are making calls to and operators can take the opportunity to increase termination charges (Beuhler & Haucap, 2003). In fact, mobile subscribers will be unable to know the price of any call and cannot take advantage of on-net and off-net rate differences too; however, the easiest way to overcome this problem would be to enforce a single rate tariff plan for all operators (Smura, 2004).

The service also tends to be technically costly to implement and many times the benefits achieved by the introduction of MNP are far lower than the costs incurred (Aoki and Small, 1999). There are initial one time costs and recurring costs which are rather high, given the technology involved. Set-up costs (network set-up, systems development, etc), customer transfer costs (porting charges including closing and opening new accounts), and call routing costs tend to be the main costs for setting up the MNP service (Lin, Chlamtac & Yu, 2003). Smura (2004) also considers database management costs, such as upgrading and maintaining charges.

As mentioned previously, operators can sometimes engage in anti-competitive behavior to tie in their customers into long-term contracts, and this is an issue that requires intervention from the relevant authorities. Not only does it stifle competition to a large extent, but with the introduction of MNP, it can also create large numbers of unused handsets. In many cases, when people switch operators they have no choice but to buy a new phone as their old handset is incompatible with the new network (Telecom Asia, 2004).

Given the benefits of implementing this facility and the drawbacks as described above, the decision to introduce MNP into a mobile market is a rather significant one. The tricky part is that its "success" is not guaranteed, as it is dependent on several exogenous factors (discussed in Section 3.0 and 4.0).

III.   Measuring the success of MNP

The successful implementation of MNP is associated with high porting rates. This is because high porting rates signify that the facility is being utilized and confirms that mobile subscribers are in demand of the service. The adoption of MNP in Hong Kong, South Korea and Australia has been touted among the most successful implementations of the facility, simply because these countries have achieved high porting rates, of over 6 percent, and have reaped significant economic returns. Spain and Sweden have also been as successful.

The reasons for these successes can be attributed to several factors, including low porting times, low or even no charges allocated to subscribers for porting their numbers, promotion of the service by regulators and subscriber awareness of the service (Lago, 2007), and the entrance of new or disruptive operators. In the case of Hong Kong, waiting time for porting a number was between 1 to 2 days only. Furthermore, the timing of introducing the MNP facility played a large role in its success; four new mobile operators entered the market at the same time that MNP was introduced, resulting in increased competition and therefore high porting rates (Keynote Capitals, 2009). Similarly, in Australia, the regulator played a significant role to educate subscribers about the service, and porting times were limited to a matter of few hours.

However, the adoption of MNP has more often than not, failed to achieve high porting rates let alone economic success, contrary to the expectations of many. This is true of Ireland, Finland, Malta, UK and The Netherlands (Iqbal, 2007). MNP has also been rather unsuccessful in Taiwan, Japan and Singapore. Katka (2004) suggests that high porting charges, long-winded applications, lengthy porting times, and handset subsidies have suppressed the change of networks on a large scale. He cites the cases of Greece, UK and France where operators have engaged in these types of activities in order to curtail the competitive and switching effects of MNP. Taaffe (2004) explains that operators in France even stipulated that customers who wanted to break their contracts had to provide upto three months notice before doing so. In UK, only one operator pushed for the introduction of MNP, and was supported by Oftel, the telecom regulator at the time. As a result, other operators imposed long porting times and even expected subscribers to obtain permission for moving from one network to another (Wieland, 2007). The porting process in The Netherlands took upto 5 weeks resulting in a failure of MNP in the country (Horrocks, 2007c). The longer the time taken for porting, it is easier for donating operators (i.e. operators who are giving up a subscriber) to win back their customers through special promotions and personalised packages.

Another reason for low porting rates is because subscribers have no need to switch networks because of the homogeneity of services on offer. The lack of competition in Ireland meant that subscribers did not perceive any benefits from a move from one operator to another, leading to low porting rates and economic failure of MNP. In Finland, operators imposed minimum contract periods which drove down porting rates from approximately 40 percent to 10 percent (Horrocks, 2007c).

In the case of Japan, mobile Internet use is very popular and many subscribers of NTT DoCoMo, the largest operator, use their phones for both calls and email. Subscribers are not able to port their email addresses along with their mobile numbers which has affected porting rates. Additionally, handsets are locked in by service providers, meaning that customers wishing to change networks have to purchase new phones. The charge for porting to a different operator is also relatively costly, working out to approximately USD 83 per port (The Economist, 2007). Singapore and Taiwan both had lengthy porting times of 4 to 7 days, which led to poor porting rates and therefore the failure of MNP (Keynote

Capitals, 2009). Similarly, it is important that SMS and MMS and other mobile applications are able to be ported to another network with little routing issues as possible.

While most of the literature attaches the success of MNP with high porting/churn rates, this paper argues otherwise. The MNP service can still be considered a success, even when these rates are low, if the threat of porting leads to improved competition among operators, and hence, lower tariffs and better services. The purpose of regulation is to facilitate a level playing field and foster competition so that end-users are able to acquire the most optimal levels of quality at competitive prices (Melody, 1999; Samarajiva 2002). As such, it could be said that if there has been a substantial effect on tariffs and QoS post-implementation of MNP, leading to satisfied customers it may be considered that the implementation of MNP is successful.

In any case, the argument for high porting rates being the sole indicator for the success of the MNP service is erroneous. Based on intuition, even if high porting rates are achieved initially, they will slow down eventually until they plateau, once subscribers are satisfied with the level of service they receive and the tariffs they are charged. Moreover, low porting rates may be an indicator of the fact that contestability or the threat of switching is leading to services and tariffs that the customers are satisfied with.

Other indicators of successful MNP include a pleasant porting experience for subscribers, simplicity and speed of porting, minimized customer complaints and minimized operator porting overheads (PTA, 2007).

IV. Preconditions for implementing MNP

Following from the previous section, it s evident that the success of MNP is dependant on a variety of factors. Among the most important of these preconditions is that there has to be sufficient demand from subscribers (or what is referred to as the minimum threshold market size), highly competitive operators and mature telecom markets, and independent and strong regulators who can drive the adoption of the service.

Minimum threshold market size

Customers should be willing to switch networks. If the demand for porting to other networks (i.e. if the likely number of ports) is low, there will be no need to introduce such a service. Not only is it costly to do so, in terms of re-working the routing systems, managing the databases and promoting the service to customers, but these costs will be unrecoverable if the service is left unused, and the adoption of MNP will be an economic failure. There are many factors which may possibly prevent users from taking advantage of MNP services, including: a) the placement of "artificial" barriers (possibly because of collusive behavior) instigated by operators to porting numbers, such as creating artificial delays in processing requests; b) a perceived level of distrust in the proper functioning of this service; and c) the financial cost of switching. Taaffe (2004) suggests that a casual attitude or 'inertia' towards switching operators by subscribers is another reason for the failure of the MNP service in France. He explains that subscribers are driven to make a change only if their operator charges excessively high call rates or are unhappy with the level of customer service they receive. However, it is also possible for QoS-based competition to stimulate subscribers to consider switching operators.

It is therefore important that regulators determine the minimum threshold market size. According to a cost-benefit analysis of the portability process, it is evident that there is a minimum market size below which will not provide overall benefits; as per the analysis carried out by John Horrocks, an MNP expert, the minimum is computed to be approximately 10 million (Horrocks, 2007a). As such, implementing this facility in countries with small populations and even smaller mobile markets proves to be economically infeasible, because the costs outweigh the benefits by a significant amount. This is clearly the case of MNP in Malta, where there has been no impact on competition and prices even after the introduction of the service. The island nation has a population of only about 4 million, a clear indicator that the mobile market size and demand for porting would be too low to be economically viable. However, given that all of European Union had regulations to adopt the service, Malta had little choice but to comply.

In such countries, it makes more sense for operators and regulators to agree to facilitate number changes when requested by subscribers. Operators could offer to send out free SMS to all the

subscriber's contacts, or maintain the old number in parallel for a given time period. The regulators must also make more efforts to increase competition to ensure that subscribers in these small states are provided with high QoS and tariffs (Horrocks, 2007a).

Level of Competition

The level of competition between operators determines the post-MNP competition and therefore success of the service. Haucap (2003) stresses the importance of the level of competition and maturity of the market when deciding on introducing MNP. According to his article, the more competition there is, the lower the need for the MNP service, because operators are likely to provide subscribers with the best tariffs and service quality possible. They are likely to find the need to innovate and outdo their competitors in order to retain their subscribers. He states, however, that this does not mean that MNP should not be introduced – the service reduces switching costs for those subscribers who do want to change networks and therefore should be considered a standard service in advanced telecom markets.

The importance of competition is evident from the failure of Ireland's MNP implementation. The market comprised of three operators, two incumbents and a weak and young competitor, meant that competition in the market was lacking. As a result, subscribers saw no benefit from switching from one operator to another, even with the availability of the MNP service, leading to poor porting rates (Iqbal, 2007).

Another consideration is how mature the mobile market is. An indication of this would be the levels of mobile penetration; the higher the penetration levels, the less chance for new entrants and/or competitive operators to disrupt the existing market structure. Unless MNP is introduced in such a market, it is unlikely that these operators will be able to survive in the long term. In order to ensure that the market remains competitive and operators are always under pressure to retain their customers, regulators need to push for the MNP facility. This does not mean, however, that MNP should not be introduced in a young and emerging market. The case of MNP in The Netherlands shows that the service need not be relegated to only mature and saturated markets, when competition is diminishing; The Netherlands introduced the service when it had a teledensity of only 10 percent

(Madhani 2006). Although it was an economic failure, the low penetration levels had little to do with this factor.

Gans, King & Woodbridge (2001) also discuss the importance of a having a dynamic market and as many willing operators as possible. This will help regulators to work with a group of driven individuals ideally pushing for the facility.

Furthermore, MNP may not be recommended in countries where a budget network model of service provision has been adopted. According to observations made by LIRNE*asia*, operators in South Asia are employing a business model that is vastly different to those adopted by their more developed counterparts around the world. While most operators in Europe and the USA follow a model where they place importance in high average revenue per user (ARPU) subscribers, operators in emerging South Asia focus on lower income users and higher network utilization (Nokia, 2008). This model enables operators to take advantage of long-tail markets, charging very low tariffs that are close to marginal costs (Samarajiva, 2008). Since operators using this model are most likely to provide the most optimal call rates already, they can only gain competitive advantages through product and service differentiation. The introduction of MNP in such a market may not be as successful, therefore, in terms of high porting rates. This is because subscribers in these economies, especially those at the middle or bottom of the pyramid make up the bulk of all subscribers, and are generally not driven to mobile use by the extra features and services. They have different phone habits due to affordability constraints and therefore will look for the operator with the most competitive rates and best QoS. As such, the implementation of MNP may not have as significant an effect on markets that employ this kind of business model. However, if a new entrant enters such a market and provides much better QoS, then the impact of MNP will be higher, making this an exceptional case in a market that employs the budget network model of service provision.

Regulatory control

It is imperative that the telecom regulatory agency is an independent and powerful entity (Iqbal, 2007). The regulator should be able to wield significant authority over the sector and be committed to driving the facility in order to ensure that MNP is successful. When MNP in Finland was failing, regulators

stepped in to ensure that operators did not provide handset subsidies and long-term contracts; they also imposed a requirement for user-friendly and free porting of numbers between networks, in order to encourage subscribers to switch providers (Smura. 2004). Oftel in UK and regulators in The Netherlands played a very minimal role in the implementation phase of MNP, leading to a poorly regulated and implemented facility (Horrocks, 2007c). It is evident, therefore, that the regulatory authority needs to have the necessary resources and power in order to drive the initiative and ensure that subscribers as well as operators are at the receiving end of a fair deal.

In summary, regulatory bodies should ask the following set of questions when considering the introduction of the MNP service:

- How high is demand for MNP from both subscribers and operators?
- How big is market size? Is it below the minimum threshold market size?
- What is the level of competition?
- What kind of pricing model is in place?
- Will MNP spur further competition?
- How strong and independent is the regulating body?

V.   Policy and regulatory implications

There are several aspects of telecom policy that are affected by the introduction of MNP. Regulatory authorities have to be concerned on the technical aspects of implementation, and pricing and payment mechanisms (Gans, King & Woodbridge, 2001). The latter is especially important if porting rates and churn is low among operators, because it raises the question of who will bear the costs (Haucap, 2003). Another consideration will be the national numbering plans of a country; this will need to be streamlined and regulators may have to reallocate numbers in order to ensure the efficient use of phone numbers. According to Gans, King & Woodbridge (2001), these policy decisions are affected by and dependent upon the questions posed in the previous section.

Implementing MNP requires technical proficiency and it is important for the regulator to have the relevant expertise in this area. The call and message routing system (all call query, onward routing, call drop back, query on release, or call forwarding), the type of number portability database (centralized, decentralized or hybrid), and the use of ENUM and next generation networks (NGN) and other such decisions are dependent on factors like regulatory independence and power sharing among industry players. The database is a crucial tool in providing MNP facilities as it holds a record of all existing mobile numbers; it is important that all mobile service providers are given the necessary incentives to link to this database. As technology develops, regulators need to stay on the ball and ensure that the technical solution they have implemented does not become obsolete.

Most countries that have adopted MNP have opted for a centralized database, with very few using a decentralized or hybrid (centralized and decentralized) database. According to Katka (2004), both operators and regulators are under the impression that a central database with a direct routing system is what works best most of the time; and this technology has been successfully utilized around the world. In many cases, an independent entity or company has been created in order to handle the MNP service and manage the routing and database functions. This is so, especially in countries where the regulatory authority has limited control over the sector and/or if it lacks the internal resources to carry out these tasks (Horrocks, 2007b). Such an arrangement has worked well in many countries too.

With the changes in call routing as a result of MNP, the regulatory authority should ensure that interconnection agreements between service providers remain fair and that no one operator is treated unjustly.

Regulatory authorities are also required to make decisions with regards to pricing and allocating costs incurred by the implementation of MNP. As with the technical decisions, these are dependent on how willing operators are to accept the introduction of MNP, the strength of the regulator and expected churn or porting rates. Given the complex technological requirements for providing this facility, there are many direct and indirect costs incurred in setting up, developing and implementing. While the setting up and implementation of MNP incurs costs such as both non-recurrent and recurrent costs

such as actual porting costs, additional conveyance costs, and costs incurred due to the lack of transparency in calling destinations (as explained above, callers are unable to determine which network or service provider they are calling if MNP is implemented; Buehler, Dewenter & Haucap, 2005), the actual numbers are based on the technical solution adopted. Each technical alternative has varying costs and therefore it is a very important decision that regulators will have to make.

As a result of the competition brought on by MNP, regulatory bodies might find that they need to invest less to regulate prices. They may find that time consuming and resource intensive regulatory tools for setting prices, such as rate of return regulation, etc, can be done away with, except unless there is no tariff regulation at all. Alternatively, regulatory authorities may have to expend greater resources on regulating interconnection rates as a result of the introduction of the MNP facility.

There is also significant amount of debate on how the costs of MNP are allocated among subscribers, operators and maybe even regulators, and this has implications on the billing procedures and systems of all the operators involved. Gans, King & Woodbridge (2001) state that users should not be burdened with these costs because it plays a role in their decision to change networks. If the charge is excessive, subscribers are unlikely to port their numbers even if it means better service or call rates. Lin, Chlamtac & Yu (2003) agree that operators should bear the costs of MNP, but concede that both equity and efficiency are important factors that should be taken into account when making the actual decision. These authors suggest that all operators should pay for the initial costs of setting up the facility, while the actual porting costs should be borne by the donor and recipient operators.[4]

On the other hand, it could be said that it is not fair for a donor operator to pay for porting because they are the ones losing a subscriber, and it is the receiver operator who should pay for porting. Some even recommend that porting should be totally paid for by a subscriber because it is initiated from their end. In such a situation, service providers charge an initial fee for porting a number and in some instances subscribers are liable to pay a monthly fee to cover the administrative costs involved. Most countries, however, have adopted the allocation as described by Lin, Chlamtac & Yu (2003). From a policy perspective, making operators pay for the service can seem like a disincentive for them to

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[4] Donor operator is the operator from which the number is being ported out to another operator, the receiver operator.

provide an efficient MNP service. Regulators have to ensure that sufficient incentives are offered to operators to encourage them to advertise and keep their subscribers in the know about their options for switching networks.

With regards to the national numbering plan, MNP calls for a reallocation of numbers. As explained before, it was the general practice for operators to be assigned a short code identifiable with the operator's network and brand. With the use of MNP, this code serves no purpose and therefore several combinations of numbers are freed for use. This is particularly useful in countries with large numbers of subscribers because the more numbers available for use, the better. Non-assignment of blocks of numbers can reduce allocation inefficiencies and curtail the distortion of distort competition; alternatively, this can also mean that there is less structure in the numbering plan (Bernardi & Nuijten, 2000). As a result of these changes in number allocations, ownership rights to numbers are seemingly passed from operators to subscribers, who control the use of the number(s) they have been assigned. This could lead to users valuing their number more than before, and as discussed, will rely on the existence of MNP to avail of the best mobile telecom services in the market (ibid).

VI.   MNP in South Asia

So far MNP can be most commonly found as a standard feature in mature telecom markets in developed countries worldwide (Keynote Capitals, 2009), however, it is evident that interest in introducing this service is increasing, especially from developing and emerging markets worldwide. Unlike the developed and mature telecom markets of the US, Europe and South East Asia (such as Japan and Korea), the bulk of mobile users from these developing economies, especially in South Asia, are considered to be low-end, non-premium customers (Zainudeen et al, 2008b). Their basic aim is to be able to communicate in the most inexpensive manner, and as such, they adopt a variety of cost-minimising strategies; one such strategy is the use of multiple mobile SIMs from different operators, in order to avail of on-net call tariffs and benefits (LIRNEasia 2008). Friends-and-family calling networks, which facilitate cheaper calls and messages between select phone numbers, are also used as part of their cost-saving communication strategies.

On the contrary, high-end, premium or business customers make up a very small portion of the market in South Asia. These subscribers do not engage in cost-saving strategies on the same level as their poorer counterparts; their main aim is to communicate inexpensively, with as little hassle as possible. It is also significantly more important for these users to retain their numbers, as switching to a new service provider will entail reprinting business cards, sign boards and other paraphernalia on which their numbers are displayed, and updating websites with new contact information. As explained, switching numbers might also mean the loss of money through the loss of business opportunities during porting time; switching costs, therefore, are significantly higher for business enterprises than for individual subscribers.

Given such a market structure in South Asia, the relevance and effectiveness of MNP is cast in doubt. It must also be noted that introducing this service is not technically or financially simple and it can have disruptive effects on competition within the market, putting significant pressure on developing markets. Furthermore, as discussed above, there are several preconditions, regulatory and otherwise, necessary for the success of MNP, many of which are lacking in these telecom markets.

Another aspect of growing importance is the focus on Mobile 2.0 applications. These are non-voice applications that enable mobile phones to be used for payments, text voting, obtaining market information, etc. These developments are of increasing significance, even at the BOP among "low-end, non-premium users" as described above. As these services evolve and grow, there may be implications on the use and need for MNP in these markets.

With all of these issues in hand, it is imperative to investigate the applicability of MNP services in emerging telecom markets in South Asia. Based on the above discussion, the paper will consider the case of three South Asian economies and the implications of MNP in these markets. Focusing on the rationale for switching from one operator to another, the measures of success, and the policy implications of this facility, the paper takes a look at the case of Pakistan, which is the only South Asian nation, at the time of writing this paper, to have adopted MNP. The second and third cases discuss the feasibility of MNP in a large country like India, on the verge of introducing the service, and

in a microstate like the Maldives which has considered implementing the service but has refrained from doing so.

Analysis will be based on an extensive review of the literature available and supported by semi-structured interviews with key stakeholders, i.e. regulators and operators, from Pakistan, India and the Maldives. This paper will also make use of the findings from a recent multi-country survey, teleuse@BOP3, conducted by LIRNEasia. The research was carried out in mid-2008, consisting of 9,750 sample representatives from the BOP, i.e. from Socio-Economic Classification D and E, in India, Pakistan, Bangladesh, Sri Lanka, the Philippines and Thailand. The survey included both quantitative and qualitative components, in addition to an innovative diary method for collecting data on call patterns and telephone use. A questionnaire was administered by trained professionals in multiple languages and locales within the countries in the study, and focus group discussions were utilized to reinforce the results of the survey. The study aimed to provide insights into telephone ownership and use, and its implications to Mobile 2.0.

The data from this study will be used to understand the BOP views and concerns of switching numbers and MNP in general. Along with the information sourced from key stakeholders in South Asia, these survey findings will be used to support the recommendations for implementing MNP in the region.

VII.   Analysis of MNP in the region

a. Pakistan

In early 2006, Pakistan introduced MNP facilities, making it the first country in all of South Asia to do so. This section details its experiences in implementing and running this service to date.

As per Pakistan's Mobile Cellular Policy, MNP was said to be implemented within two years of policy notification. The notification was made in 2004 and portability was launched in March 2006. The Pakistan Telecommunication Authority (PTA) drove the initiative, in collaboration with all of the existing operators, in order to ensure the smooth transition to an MNP-possible marketplace. The

reason for introducing this service was to ensure that mobile customers in Pakistan had the opportunity to use the operator of their choice without having to incur excessive switching costs. The policy decision was made along with a series of other reforms that the Chairman, Maj. General Shahzada Alam, made during his tenure. Other decisions taken during this period included the adoption of a licensing framework and mobile license auctions, which resulted in a drastic increase in Foreign Direct Investments (FDI) and mobile subscriber growth (Samarajiva, 2008b).

Although the notification for MNP was made in 2004, the actual process only began in May 2005. According to sources at the regulatory agency, the move for the MNP facility was supported mostly by the newer telecom operators, including the government-owned incumbent service provider, and most importantly, the regulatory body, while older operators opposed the move. Several meetings, involving all stakeholders, were held in order to make the decisions on technology and pricing. Given that the introduction of MNP had several implications on the sector in terms of operations and policy, PTA had to enforce an action plan that all operators had to follow (Telecom Quarterly Review, 2007, and introduced MNP Guidelines and a Code of Practice for operators.

The technology adopted was that of a hybrid one where the database is both centralized and decentralized. The centralized database is maintained by an independent entity, co-owned by all of the operators. The company was funded by existing operators, except for one (Instaphone), each contributing approximately USD 140,000 (about PKR 12 million) to set it up; the board is made up of representatives from the operators, PTA and Pakistan Telecom Company Limited (PTCL, the formerly government-owned incumbent operator). The company is called Pakistan Mobile Number Portability Database (Guarantee) Limited Company (PMD), and its main function is to provide support to each operator to ensure that porting processes take place as efficiently as possible. Each service provider maintains its own (decentralized) database which is linked to PMD's database, and was also required to upgrade their switches and technology in order to facilitate the service. Operators and regulators agreed on a direct call routing model, but also made allowances for onward routing if it was mutually agreeable to those operators involved.

The policy document specifically stated that customers will have to pay a onetime charge for porting their numbers and that they would not be faced with recurring charges. The decisions on who pays for porting were taken collectively, and it was agreed that subscribers would pay the recipient operator a fixed fee to get their number ported. The recipient operator in turn would pay the donor operator a certain amount for making the transfer of the number. Both operators would have to pay set-up and operational fees to PMD for accessing the MNP database. Ported numbers are entered into the database, and PMD charges operators on a per transaction basis. Every time a call is made to or made from a ported number, operators have to gain access to the database too, and so PMD imposes a per minute usage charge. On an annual basis, operators spend up to about USD 1.18 million (PKR 100 million) in total for maintenance of the PMD.

According to sources at the PTA, while the main objective of introducing MNP was to enable easier switching between operators, it was also hoped that the facility would increase competition and better existing QoS among operators. They acknowledged that the costs were rather heavy, especially for operators, as they had to bear the costs of the network overhaul that was required. Given that a significant portion of the market was made up of prepaid subscribers, it could be said that MNP was targeted at these users, as operators decided to have a zero-charge policy for these subscribers right from initiation. On the other hand, postpaid subscribers were subject to a charge of USD 1.18 (approximately PKR 100) per porting, but with declining porting rates, this charge has fallen to almost zero.

Pakistan's MNP experience

So far, MNP in Pakistan has been deemed a 'success' by regulatory officials. However, porting rates are between 2-3 percent even with an average porting time of approximately 4 days; average prepaid porting, to date, is between 2-3 percent while postpaid porting, the group most likely to appreciate the service has only been between 0-1 percent. This has been less than what was anticipated prior to the launch of MNP, and industry specialists acknowledge that the impact of service has not been as expected in general.

The most common reasons cited for porting have been recorded as tariff, network quality and coverage and for prepaid users, value added services (VAS). As a result of the introduction of MNP, other services such as call forwarding, friends and family loyalty schemes, and other similar services were affected. Subscribers who ported their numbers to another network were unable to take advantage of these bonuses and features. However, the regulator does not consider this as a barrier to porting, especially for those prepaid users at the BOP; instead they feel that regardless of the porting rates and demand for it, such a service is a basic right of users to change networks if they are not satisfied with the services they are receiving. Operators feel that there is still very little awareness among the general public about the service; according to one, they estimate that only 6-7 percent of all subscribers are in the know about the facility. This could perhaps be due to the fact that the PTA does not enforce the advertisement of this feature and operators are not keen to let people know they have the option to change service providers.

However, operators do state that MNP has, in fact, increased competition since its launch, as well as forced operators to improve network coverage and quality. This is evident from the falling number of subscriber complaints about QoS that PTA has received in the recent past (PTA, 2008). In sum, the general perception is that MNP has been relatively successful (or 'it could have been worse'; and operators and regulators both gave it a score of 6 on a scale of 1-10, 10 being the most optimal). Their reasons for this relatively average score is that the facility has a lot of potential in Pakistan, but operators have not been able to garner the full extent of its impacts due to lacking public information and awareness. Media coverage, as mentioned, has been minimal, but is seen and hoped to pick up in the near future.

In analysing the conditions that were prevailing in the Pakistani mobile market at the time of introducing this service, it is understood that the minimum threshold market size, level of competition and regulatory control were aligned such that the timing was right for the service. With a population of 145 million (Population Association of Pakistan, 2002) and a mobile telecom market of 34.5 million in 2006 (approximately 23 access paths per 100 people in 2006; PTA, 2006), there was enough potential demand to propel the service and ensure that it could be an economic success. Furthermore,

with a national HHI of 0.33[5] indicating reasonable competition between the then six mobile operators, the introduction of MNP was seen to have been useful to push this further, creating more churn in the market. Pakistan already had among the lowest prices for calls and SMS in the world, and while the impact of MNP on price competition, it had to be acknowledged, would be low, it was hoped that it would have a significant impact on service competition. With the support of the PTA, a strong and independent regulatory agency which was making significant strides in developing the telecom environment in Pakistan,[6] and recognized worldwide for its achievements,[7] the preconditions, as specified, were in place for the launch of MNP.

b. India

India, the largest economy in South Asia with a GDP of approximately USD 3.288 trillion in 2008 (International Monetary Fund, 2009), has been considering the adoption of MNP since 2006. The Telecom Regulatory Authority of India (TRAI), the independent regulatory body, has indicated their plans to introduce the service but is yet to show results. While initial requests to launch MNP by early 2007 were vetoed by the Department of Telecommunications (DoT), the decision was rescinded and the service was then due to be launched by the end of the year. The launch was later moved to mid-2008. Since then, several reports by the media and statements by TRAI claimed that the facility will be in operation by the end of 2009, but the date has and still keeps moving forward. The expected date for launching has now moved to March 2010 (Telecom Talk, 2009).

Initially, TRAI was to stagger the introduction of the facility and launch in selected cities in two separate zones by September 2009, while the whole country was to have access by May 2010 (Indiaserver.com, 2009). Zone 1 comprised of locales of the North and West and Zone 2 covered the South and East of India. The metropolitan areas in both zones were to be provided with the facility before being introduced in rural areas (Krish, 2009). Two MNP providers, Syniverse Technologies and MNP Interconnection Telecom Solutions – selected through a 'beauty parade' – were established to operate and maintain the databases in Zone 1 and 2 respectively (Das Gupta & Zarabi, 2008; Indiaserver.com, 2009). The delays in launching the service have been attributed to DoT's delays in

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[5] Source: Authors; the Hirschman-Herfindahl Index (HHI) is an indicator of the amount of competition between firms in a market.
[6] As per the Telecom Regulatory Environment (TRE) scores achieved, in 2006, Pakistan was judged the best of all five countries studied – it scored 3.1 in the mobile sector while India and Sri Lanka both scored only 2.9 out of 5 (LIRNEasia, 2006.
[7] In 2006, the Pakistan telecom sector was awarded the GSMA Award in recognition of its progressive telecom policies (Bhatti, 2006).

amending the National Numbering Plan (Philip, 2008), as well as the lack of readiness by operators and the two MNP providers (cellular-news, 2009; CIOL Bureau, 2010). With so many deferments, the planned incremental launch will be done away with and MNP will be made available all across the country in one go (Ribeiro, 2009).

According to the MNP Guidelines defined by TRAI, new mobile subscribers who have had a connection for a minimum period of three months (or 90 days) only can port their numbers. Once a number has been ported to a new operator, the subscriber is required to use their services for 90 days before being able to port out again. This has both merits and demerits, because a subscriber is stuck for three months with one operator, but also cannot arbitrarily port whenever he/she feels like it, or to avail of short term promotional fares on different networks (MediaNama, 2009a). The time taken for porting has been specified as a maximum of four working days; weekends are excluded from this timeframe. The duration for having no service between porting from one operator to another is expected to be a total of two hours in all.

Why MNP?

The introduction of MNP is expected to increase churn rates and force service providers to stay competitive through product and service differentiation. Prepaid churn rates are said to be between 3-4 percent per month but the regulator is looking to increase it to about 8-10 percent, in order to force incumbent operators to be more competitive (Business Standard, 2007). Although competition is high in the Indian mobile sector, regulators feel the need for more intense competition for the benefit of subscribers. This is supported by the findings of a recently released market study on the potential for MNP in India, conducted by Keynote Capitals Research (2009), which indicates that as penetration has increased in the metropolitan areas of India, growth of the sector has slowed down, underscoring the importance of MNP as a driver of competition.

TRAI also hopes that it will drive prices lower, and the same study asserts that MNP will intensify price competition within the sector (Business Standard, 2007; Keynote Capitals, 2009). Although this may be true to a certain extent, it may not be the case given the pricing models that are employed in India (and South Asia) at the moment; this is discussed in further detail below.

Regulators also hope that MNP will create a more level playing field for all existing operators (Business Standard, 2007). As explained by the Keynote Capitals Research study (2009), MNP will give the five new entrants into the mobile sector and four existing operators who have been allowed to provide services in new circles, a chance to survive in the already competitive marketplace.

Given the anticipated growth in the mobile market to more than 500 million subscribers, one of the largest in the world and second only to China, regulators feel that the introduction of MNP in India is imminent and deem it a suitable time to set the stage to push subscriber numbers up.

Is the timing right for MNP in India?

Taking into considerations the predefined preconditions for MNP, it is clear that, like in Pakistan, the Indian telecom market does meet the necessary requirements to introduce this service. For one, being one of the largest mobile markets in the world and having a population of over 1.18 billion (India Stat), the Indian marketplace exceeds the minimum threshold market size of 10 million by a large margin. Even though access paths per 100 people is relatively low, with only 40.31 having access to mobile phones in the country (TRAI, 2010), the market is large enough to guarantee that demand for MNP can be economically viable.

At the same time, there is still relatively intense competition in the Indian telecom market, nevertheless, data suggests that competition between operators at a circle level, as gauged by HHI, has fallen between 2003 and 2007 (TRAI 2), while overall competition at the national level was said to have stagnated at 0.16 in 2009.[8] ARPUs have also been falling in the last few years and prepaid ARPUs are now as low as USD 2-3 as of 2007 (Pluggdin 2007). According to a study by LIRNEasia (2009a), India has a low monthly total cost of ownership (TCO), with average prepaid subscribers spending as little as USD 6.04 per month.[9] This indicates that operators probably follow a budget telecom network model, and operate on very low cost margins.

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[8] Source: Authors.

[9] The methodology takes into consideration usage charges (voice and SMS), line rental, connection charges (depreciated over a three year period), and applicable taxes.

On the regulatory side, TRAI, which was set up in 1997, has played a significant role in the performance of the sector in the last decade. Although it falls under the jurisdiction of the DoT and does not have unchecked independence to make its own decisions in order to regulate the telecom sector, TRAI has been key in the development of the wireless market. The Authority has functioned efficiently and has worked alongside the Cellular Operators Association of India (COAI) and the Association of Unified Telecom Service Providers of India (AUSPI) to develop the mobile sector into a profitable one. The opposition for MNP in 2006 was sustained because of the influence of COAI, who argued that MNP would be too costly for the market and would ultimately lead to an increase in tariffs (Das Gupta, 2006). However, this was retracted after an IDC survey, cited by TRAI in its MNP Consultation Paper, provided evidence that there would be sufficient demand to ensure the economic success of the service. According to the survey "30 per cent of mobile subscribers are likely to shift to an operator offering better services, if given the option" (The Hindu, 2005).

As consumer trends evolve and there is a growing need for the regulator to protect their interests, it seems like an obvious move for TRAI to have called for the implementation of MNP in 2007. With a growth and investment potential far exceeding most other telecom markets in the world, the Agency has been adopting as many measures as it can to establish its market as one that has arrived. While opponents of the service argue that the market is still young with much potential for significant growth in the coming years and no need for MNP at this time. They argue that network coverage only accounts for about 40 percent in the country and there are more pressing matters that regulators should look into. Proponents, on the other hand, are sure that MNP will only help to develop the market further and give subscribers the flexibility they need, even at this adolescent stage. In response to the question posed on whether the timing is right, TRAI and other proponents are of the view that if not now, in any case MNP is a facility that will have to be adopted later in a telecom market. Since the sector is still growing, in terms of demand and supply (with the entry of more operators in select circles), and subscriber telecom behaviour is still evolving, it may not be a bad time to adopt it.

On the other hand, though, the question should be asked of whether TRAI is considering location portability, along with MNP, as this is possibly more of value to both prepaid and postpaid subscribers

(MediaNama, 2009a). With increasing rates of migration from rural areas to the cities, it is more likely that location based portability – for example, porting from a mobile operator in Delhi to an operator in Chennai, will be more useful to internal migrants and those moving from rural areas to the metros. Introducing MNP alone will not be sufficient to meet future mobile subscriber needs and ideas of flexibility.

In any case, as a result of the way MNP has been handled in India, there seems to be a lot of hype and expectations from all stakeholders involved. However, the repeated postponements have put doubt into the minds of many if TRAI will be successful in introducing MNP any time soon. In addition to this, there has been some confusion and vagueness on how much subscribers will have to pay for the service, once it comes into effect. TRAI expects that subscribers will have to pay between INR 20-200 (approximately USD 0.43-4.34), which for some low-end prepaid users is higher than their monthly spend on telecoms.[10] Other reports suggest that the cost will be between INR 250-400 (about USD 5.42-8.66). There is still no information on how much operators will charge for porting and this can dampen porting rates further. With such misgivings, there is too much uncertainty to be convinced that MNP is right for India at this time.

Potential implications

An IMRB study, entitled "Switch",[11] which looked at 40,000 subscribers with a connection of upto three months in seven cities around India, found that 70-90 percent of all sampled subscribers are number loyal, with only 20 percent who will make a switch to a different operator when MNP is introduced. Only 10-20 percent of all prepaid subscribers indicated that they would be willing to port their numbers (Kar, 2009). These findings are also corroborated by the Nielsen Mobile Consumer Insights study (2009) on the attractiveness of MNP for postpaid and high-spending users in India – accordingly, only 18 percent of the 12,500 sampled subscribers will port their numbers if the service is in place. As mentioned previously, in many cases prepaid subscribers tend to be lower-end, non-premium customers, whose chief objective in using the mobile phone is to make cheap calls. Cost saving is the main driving factor behind the decision to obtain a phone and use it too; furthermore, compared to postpaid subscribers, prepaid subscribers are less number loyal. Given that the bulk of the mobile

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[10] Prepaid low users are estimated to have a TCO of only USD 2.53 (LIRNEasia, 2009a).
[11] The study "track[ed] the likely churn or the number of subscribers who will shift from one service provider to the next, GSM to CDMA, pre-paid to post-paid and so on" (Kar, 2009).

market is made up of prepaid subscribers, approximately 94.8 percent (TRAI, 2010), the effects of MNP on this market may not be as high as expected. TRAI, in fact, has been realistic enough to estimate that annual porting will be 2 percent for 5 years after launching the service (MediaNama, 2009b).

The Keynote Capitals Research study (2009) confirms that non-metropolitan locales comprise of subscribers with lower per capita incomes, who spend less time and money than their metro-counterparts on mobile use. In support of this, the Switch study found that the largest percentage of switching will be in the urban areas of Delhi and other large metros, among postpaid subscribers (Kar, 2009). The Nielsen study also confirms this, with the most number of subscriber ports to be in the Mumbai and Delhi Metros as well as other large cities countrywide (The Nielsen Company, 2009). It is evident then that the effects of MNP will be felt most in the metros, where subscribers are more dynamic and likely to switch networks in order to acquire a variety of functions and services. Additionally, competition within these circles is higher, as subscriber numbers are limited and operators will try to hold on to every customer; it is expected that the introduction of MNP will facilitate further competition (Keynote Capitals, 2009).

The Keynote Capitals Research study (2009) is also in line with TRAI's expectation that MNP will increase mobile price competition. However, as mentioned, India follows a budget telecom network model and already has some of the lowest call rates in the world (Nokia, 2008). Therefore the impact of MNP on price, while true, may not lead to as great a drop in prices as expected. The question that begs to be asked is: how low can operators reduce prices in order to be both competitive and profitable at the same time? With dwindling ARPUs and the recurring high costs of maintaining the MNP facility, there is little that operators will be able to do to compete on tariffs. Although the most likely reason for porting in India will be to avoid network congestion, the second most likely reason is to avail of better tariff plans (Kar, 2009). Since the larger proportion of prepaid subscribers, will be hoping for further reductions but it is unlikely that any will be forthcoming, there will be little attractiveness to port their numbers to other operators, and the prepaid market will not witness as much churn as is expected. Except for those who already intended to make a switch, there will be

limited reasons for most prepaid users to do so. Another reason for low porting among prepaid users will be the fact that the balance on the prepaid connection will be lost when ported (TRAI, 2009).

Instead, operators should focus their efforts on postpaid subscribers, who are less likely to be price-sensitive but keener on better QoS and a variety of VAS; operators will have to focus on the strength of their brands and utilize other tactics in order to tie in these high-ARPU subscribers to their networks. As stated in the Switch study, the fight for customers will be based not on tariff plans and price wars but on what a subscription/connection with the operator will mean; there will be an increased emphasis on quality and service (Kar, 2009).

In Hong Kong, approximately 30 percent of mobile subscribers ported their numbers following the introduction of MNP, resulting in an intense price war. This churn is what spurred the success of the facility (Madhani 2006). While the need for price competition may ring true for the success of MNP, especially in smaller mobile markets like this, it could be argued that the size of the postpaid segment within which will see the most amount of churn in India, alone, may lead to an economic success; it might even be likely that operators can cover the costs of setting up the facility.

Another implication, as identified in the Switch study, is that there will be many subscribers, especially high volume ones, porting from CDMA to GSM once MNP is launched. However, in addition to switching costs, these users will also have to invest in new handsets that are GSM compatible. The study also warns that in any case, any churn caused by the introduction of MNP will last for about two to six months, after which the rate is said to dwindle down (Kar, 2009).

To sum up the Nielsen study, it is clear that the postpaid segment of subscribers will be the most likely to make the most of the porting facility. Figure 1 below depicts the number of subscribers who will definitely switch operators and it is clear that postpaid subscribers and high-spenders (usually also postpaid subscribers), and business users (almost always postpaid subscribers) will be the largest groups that will utilize MNP (The Nielsen Company, 2009).

Figure 1: Intention to switch operators

Source: Nielsen, Mobile Consumer Insights, Q1 2009 ■ Today ■ Post MNP
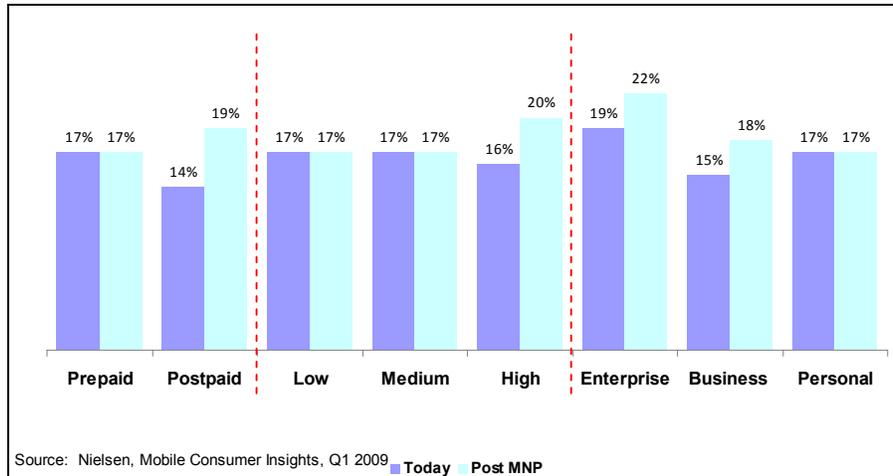
c. Maldives

Maldives has a population of about 300,000 scattered across several small islands. There are two mobile operators and mobile penetration was 140 percent in 2008 (ITU, 2009). Both operators were supportive of the move towards such a feature in the market, with Wataniya, the second operator in the Maldives, always pushing for this service (Wataniya, 2007). The small island-nation considered introducing the facility and conducted a feasibility study in October 2007, but gave up on the idea because the excessive financial costs outweighed the expected benefits (Galpaya, 2008). Given the limited size of the population alone, the regulatory agency, Telecom Authority of Maldives (TAM), made a good decision by withdrawing the plans to implement the facility.

It is also evident that MNP in other microstates such as Bhutan and Nepal will play a very minute role, simply because these markets are too young and have very low mobile phone penetration levels. The total number of subscribers is so low, approximately 251,000 and 3.3 million in 2008 respectively, far below the minimum threshold market size of 10 million active subscribers (ITU, 2008).

VIII.   Lessons for the region

Preconditions for MNP

Many South Asian telecom markets are still under-developed and currently in the process of evolving. India and Pakistan have been making significant steps in the direction for fostering an exemplary telecom environment, as evidenced by the Telecom Regulatory Environment (TRE) scores of 2008

(Galpaya & Samarajiva, 2008). As discussed in this paper extensively, mobile markets have to be ready for the introduction of MNP and this necessitates that certain preconditions are met beforehand. It is evident that both Pakistan and India meet these requirements, while Maldives falls short on at least two of them (market size and competition). Table 1 summarises the preconditions that can help make or break the introduction of the facility.

Table 1: Preconditions for MNP

	Pakistan	India	Maldives
Minimum threshold market size	145 million population and 34.5 million mobile subscribers	1.18 billion population and 471.73 million mobile subscribers	396,000 population and 457,770 mobile subscribers
Level of competition (HHI at the national level)	0.33	0.16	
Regulatory control (Overall TRE scores)	3.4	3.0	3.5

Sources: Population (Population Association of Pakistan, 2002; India Stat; CIA The World Fact book); Mobile subscribers (PTA, 2006; TRAI, 2010; TAM); TRE scores (Wilson, 2008; Malik 2008; Galpaya, 2008).

Measuring the success of MNP

As indicated, high porting rates are not the only means to measure the impact or successfulness of MNP. The facility is understood to have a similar progression to that of a product life cycle, peaking at the onset and then gradually slowing down or plateauing after a certain period. This is because mane subscribers tend to try out porting when it is first introduced and then customer inertia sets in and subscribers tend to stick to the operators they are with, even if they are not completely satisfied with their services. Over time, in many cases customer loyalty also tends to increase, leading to lower porting rates than otherwise expected. As such, basing the 'success' of MNP purely on this figure is unrealistic. As argued, it is better to ascertain the indirect impacts on competition – as measured by HHIs, pricing – reductions, and improvements in QoS or even the range of VAS on offer. Of course, the facility is meant to increase customer satisfaction and provide subscribers with flexibility, so low porting times and low costs will help in achieving this. In Pakistan, the success of MNP is evident from growing satisfaction among subscribers, with the PTA receiving fewer complaints against operators

since the launch of the facility. India, has been realistic with its targets and has gauged that porting rates will be as low as 2 percent and consistent for considerable period of time. TRAI also acknowledges that while MNP will not have as big an impact on pricing, it can help to streamline QoS and the proliferation of VAS, which in turn will increase customer satisfaction.

*Bottom of the pyramid (BOP)*

A large proportion of the Pakistan and Indian mobile market is made up of those users from SECs D and E. These subscribers are mostly on prepaid connections and use the phone for very specific purposes such as relationship maintenance and for business (such as farming and trading). Not everyone has a phone within the subscriber's social network and many tend to use their mobile phones as a shared device, with friends and family (LIRNEasia, 2009b). Affordability and tariffs are key and these subscribers use their discretion in deciding what type of calls they make and SMS messages they send, when they will make these calls and for how long. As such, these subscribers are inclined to adopt as many cost saving strategies as they can in order to keep their monthly spend on mobile telecoms at a minimum.

According to the findings of the T@BOP3 study, the most popular strategy is to make calls from mobiles to other mobiles when rates are lower (on-net, off-peak); the second most popular strategy is missed calling or as is commonly known in South Asia, 'ring-cuts'. The fact the MNP will reduce user awareness on where their calls are being routed, will limit their ability to make use of on-net tariffs. This has already been discussed as a negative impact of MNP in Section II, and as mentioned, can only be overcome if mobile markets move towards undifferentiated pricing schemes between services providers.

In order to make use of the various on-net tariff promotions and free minutes that operators provide, the findings of the study suggest that many BOP mobile subscribers in all of the countries studied are actually multiple SIM holders. Obtaining a new connection has now become so cheap and accessible, that an urban male respondent was likely to have three SIMs while a rural male respondent had two; urban female respondents were also likely to have 2 SIMs while their rural counterparts had only one connection. In India, 9 percent of all BOP mobile subscribers own more than one SIM, while in

Pakistan the corresponding figure is 23 percent (Figure 2). This is so even in the Maldives – which was not part of the teleuse@BOP3 study – where subscribers tend to have SIM cards of both operators in order to avail of on-net call plans (Galpaya, 2008). What is interesting is that these subscribers are not from SECs D and E, yet they employ the same strategies for saving money on communication.

Figure 2: Number of active SIM cards owned for personal use (% of BOP mobile owners)
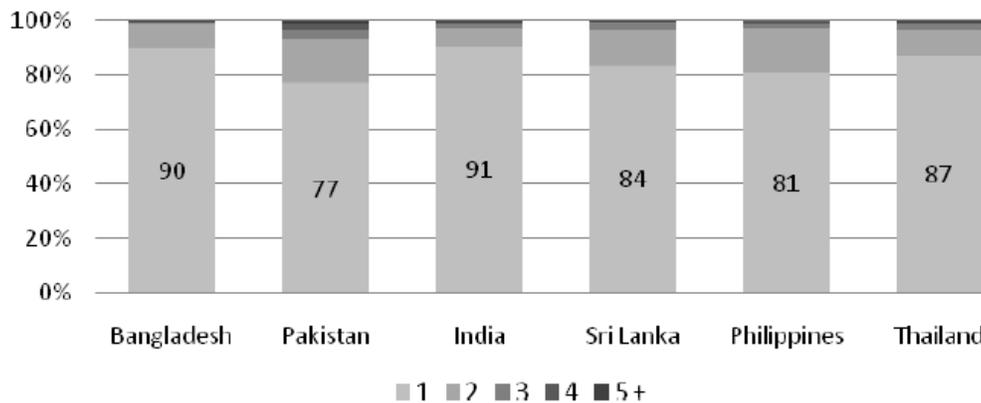
Source: LIRNEasia 2008.

The teleuse@BOP3 study also found that while multiple SIM use was primarily to make use of discounts for calling on the same network, subscribers also relied on many connections to avail of better network prices (18 percent of Pakistan's BOP subscribers and 10 percent of India's BOP subscribers responded in the affirmative). For example, in India it was reported that although one subscriber had a Vodaphone connection, he/she also had an Idea connection because it had a better quality network. Another reason for having many phone subscriptions is to be able to connect to different social groups, such as girlfriends and boyfriends.

Given this use of multiple connections, it could be said that there is very little number loyalty among SEC D and E users. What this means for MNP is that not many subscribers from this segment of the population will be keen on retaining their numbers to port to different networks. But it does not mean that many will actually port to another operator. Instead, if a subscriber is not satisfied with the services he is receiving, or feels that another operator has lower tariffs, or has more contacts on another network, his initial move would be to simply purchase or obtain (hand me down, through

promotions, etc) another SIM card connection that will enable him to make use of these better services and tariffs, and connect to his friends and family. In fact, 32 percent of all Pakistani BOP mobile subscribers and 26 percent of Indian BOP mobile subscribers said that they would definitely not consider switching even to a cheaper package, indicating that even with this type of widespread multiple SIM use, there is some kind of operator loyalty. This could be considered a type of 'subscriber lock-in', also discussed below, and is supported by the fact that 54 percent of all Pakistani BOP mobile subscribers and 40 Pakistani BOP mobile subscribers will not change their operators (even if they offered a cheaper package), simply because they want to retain their number. The qualitative data from the study explains that this is not because of heightened 'number loyalty' as is evident in developed markets, but because of the need to make best use of on-net calling and SMS schemes and group discount plans.

Another cost minimizing strategy adopted by BOP is the heavy use of text messages (86 percent of Pakistan's BOP mobile subscribers use SMS and 62 percent in India). In most cases, one SMS is cheaper than a one minute call and so the former is more preferred. In Pakistan and India this is most common among urban, educated BOP subscribers, whose primary need is to communicate with friends and family. These users are most likely to make use of SMS over making a call. Operators in India have tried to bridge the gap of using SMS by those who lack the expertise to communicate in writing, especially on a mobile phone, by enabling voice messages, but these subscribers claim that it is difficult for them to understand the procedure; since the cost of these SMS and a voice call were almost the same, subscribers still preferred calling. Since there seems to be some dependence on text messages, even at the BOP, it seems fair to suppose that subscribers who are interested in porting will expect to have their SMS also working as quickly as calls. As discussed, the technological implications of routing SMS and even MMS and other common VAS across operators, when a subscriber makes a port, can be tricky and the infrastructure solution in place should address this. If not, this could be a dampener on expected porting rates too.

This will become a more important concern as the importance of Mobile 2.0 services increases in the near future. Mobile 2.0 applications such as MMS, voice SMS, GPRS, real-time updates on sports, weather, astrology and news, as well as downloadable ringtones and wallpapers, are growing in use,

especially among the younger generations of mobile phone prepaid users and even those at the BOP. Operators need to come up with more innovative ways to engage their customers and spend a lot of time researching and developing these Mobile 2.0 applications; while these are generic and appeal to the masses, there are more specific and customized applications such as those that can be used to get agricultural and fisheries information, voting, health services, payment services, government services and banking and financial services. In India, 10 percent of BOP mobile subscribers are aware of voting applications, while Pakistan's BOP subscribers are more aware of payment functions, voting and health services. As these applications develop and advance, it will be important that these same tools and services can be availed of if the number is ported out to another network. If not, then this will hamper the impact of MNP in a market, resulting in low porting rates. This is similar to the problem faced by Japanese subscribers, who did not switch operators, even though they would have liked to, simply because they could not move their email addresses along with the port too. As such, the implications of Mobile 2.0 services on MNP can be an obstacle.

One of the biggest barriers to porting from one network to another is the significance of social networks. According to the survey, BOP subscribers are highly dependent on their social networks and use their mobile phones (and other forms of communication) especially for relationship building activities. Mobile phones help foster these social interactions through special Friends and Family (F-n-F) network promotions which allow subscribers to make calls and send SMS to select numbers on the same network at lower rates than otherwise. Also, younger male respondents were found to be instrumental in the choice of connection purchased/obtained for their parents, families and friends. As they influence their own social networks to take up a certain connection, this then ties them in to one network with group deals that can be availed. As such, MNP will hardly have any impact in such a set up, because very few members of a social network will want to leave the comforts of a group plan in order to avail of better services or even call tariffs (unless the whole group decides to make the move).

Budget network model of service provision

As described previously, several South Asian nations utilize what is termed the 'budget network model of service provision'. This model enables service providers to operate at very low costs and therefore charge low tariffs from their subscribers too. This is how Bangladesh, Pakistan, India and even Sri

Lanka have managed to have the lowest total monthly costs of phone ownership (Nokia, 2008). With low and falling ARPUs, operators have to now differentiate their mobile connections based on QoS and the VAS they provide. Pricing mechanisms are so low, that price wars in these markets, will become less frequent, except for when an operator releases a special promotion rate or discount package (which is likely to be for only a limited period of time). Coupling this model, with the knowledge that the bulk of all subscribers are prepaid and are cost-conscious, there is little that operators can do to retain them. As discussed, service providers can focus on building up their brand image and emphasizing brand loyalty, while providing high QoS and network coverage. Service providers trying to poach the subscribers of other operators can attempt this too, but this may not be enough just yet, at least, to entice BOP subscribers and even regular prepaid customers to port their numbers out of their familiar networks.

IX.   Conclusion

MNP is considered a must-have facility in most western, developed markets, due to the flexibility and freedom it provides to mobile subscribers. Unlike the mobile markets in South Asia, these economies have achieved high levels of penetration and competition and are able to withstand the policy implications of the introduction of the service. Countries in South Asia, on the other hand, are yet to achieve universal service provision and access, and lack the necessary factors that will ensure the success of MNP. As such, this facility may not be as important as it is in this region, given the topography, existing market structures and subscribers.

Furthermore, existing market structures in South Asia may not be as suited to MNP because of the large numbers of prepaid or low-end users. Their phone use patterns and requirements are rather distinctive, compared to high-end postpaid subscribers, commonly found in the developed western markets.

In any case, the importance of MNP may be declining, due to falling of switching costs. Number changes are getting easier and the use of email and other technologies makes it easier for subscribers to notify their networks about their new numbers. In the case of business, many use word

processor templates for their invoices and letterheads, which can be edited within seconds, in the case of a change in phone numbers. Additionally, the cost of having multiple SIMs, and running parallel accounts, is so cheap that subscribers will not miss an MNP facility.

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