

CONSULTATION

Issuing additional mobile licences

The possibility of issuing additional mobile licences in the Kingdom of Bahrain

**A Consultation document issued by the
Telecommunications Regulatory Authority
3 July 2006**

The address for responses to this document is:

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PO Box 10353, Manama, Kingdom of Bahrain

Alternatively, e-mail responses may be sent to the Authority's email address at consult@tra.org.bh

The deadline for responses is 5pm on 3 August 2006

Purpose: Initial consultation on introducing further competition into the mobile sector of the Kingdom of Bahrain



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Issuing additional mobile licences

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1 Introduction

1.1 PURPOSE

The purpose of this consultation document is to present, for comment, the Telecommunications Regulatory Authority's (TRA's) initial views regarding the potential scope for issuing additional licences in the mobile telecommunications sector of the Kingdom of Bahrain.

In this consultative document, the TRA is seeking to take the first steps towards making two related choices:

- Whether to issue a further mobile licence or licences; and
- Whether any such licences should be for Mobile Network Operators (MNOs, as with Batelco and MTC) or Mobile Virtual Network Operators (MVNOs) or both.

The consultation therefore considers the potential scope for the possible entry of additional mobile telecommunications network operators or the possible entry of mobile virtual network operators¹.

1.2 FRAMEWORK

The telecommunications sector in Bahrain is governed by Legislative Decree no. 48 of 2002, which promulgated the Telecommunications Law ("the Law"). The Law set out a framework for the liberalization of the telecommunications sector in Bahrain and established the Telecommunications Regulatory Authority (TRA) as an independent regulatory authority to oversee the telecommunications sector of Bahrain.

The objectives of the TRA include the promotion of effective and fair competition among new and existing licensed operators and ensuring that any person applying for a licence to provide public telecommunications services shall be able to provide those services.

Under the Law, all telecommunications network operators and service providers must be in possession of a relevant telecommunications licence. In addition, the Law provides that in cases where radio frequency is also required for the operation of the telecommunications network, a separate frequency licence must also be granted to the telecommunications operator. According to Section 3 of the Law, the TRA is the competent authority for granting telecommunications licences and frequency licences to licensed telecommunications operators².

¹ Please see Section 6 for a glossary of terms used in this consultation document.

² The Law defines two types of telecommunications licence: a Class Licence and an Individual Licence. Operating a mobile telecommunications network ("MNO"), or providing services as a type of mobile virtual network operator ("MVNO"), will require an operator to have an Individual Licence. As set out above, a mobile telecommunications network operator will also require a frequency licence.

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At the time the Law came into force, BATELCO TELECOMMUNICATIONS B.S.C. ("Batelco") was the sole provider of telecommunications networks and services within the Kingdom. In April 2003, the TRA introduced competition into the mobile sector in Bahrain by issuing, through a comparative selection process, a licence to MTC VODAFONE BAHRAIN B.S.C. ("MTC-Vodafone") to operate both 2G and 3G networks. MTC-Vodafone launched services in December 2003.

The Law assured Batelco and MTC-Vodafone of a two-year period of no additional licensing in the mobile sector³. This period elapsed in April 2005, two years after the award of MTC-Vodafone's licence, since when the TRA has had power to license further entry into the mobile sector. Section 39 of the Law provides that, at the discretion of the Authority, this could take the form of MNO and/or MVNO entry⁴.

Given the growth in Bahrain's mobile sector since the introduction of competition and the recent expiry of Batelco and MTC-Vodafone's two-year exclusivity period, the TRA is now considering whether it is appropriate to allow further entry into the mobile telecommunications sector. If further entry is deemed appropriate, the TRA must then also consider the form it should take, that is, whether through additional MNO entry or through the introduction of MVNO services or both. This is the subject of the present consultation document.

This consultation is part of the procedure that the Law requires the TRA to follow when determining whether to take a measure that will have material effect on the telecommunications sector, with the purpose of giving interested parties the opportunity to present their opinions. The consultation will be held in accordance with the Consultation Process Regulation that was issued by the TRA on August 10, 2003.

1.3 COMMENTS

The TRA invites comments on this consultation document from all interested parties.

Comments should be submitted before 5p.m. on 3 August 2006.

The address for responding to this document is:

The General Director
Telecommunications Regulatory Authority
P.O. Box 10353, Manama, Kingdom of Bahrain

³ If the operators were found to be engaging in anti-competitive conduct during this time, as defined by Section 65 of the Law, then the TRA would acquire the authority to license a third operator during the first two years of MTC-Vodafone's licence.

⁴ A Mobile Virtual Network Operator (MVNO) can take a number of forms, and the TRA discusses several of these in Section 2.2.1. The most general definition of an MVNO is that it is a provider of public mobile telecommunications services that does not hold an assignment of spectrum and has no or limited network infrastructure.

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Alternatively, responses may be sent to the TRA for the attention of the General Director by email to consult@tra.org.bh or by facsimile to +973 17 532 125.

Unless submissions are marked “confidential”, the TRA reserves the right to make all submissions available to the public. If a submission is marked “confidential”, reasons should be given which the TRA will evaluate. The TRA may publish or refrain from publishing any document or submission, at its sole discretion.

1.4 THE STRUCTURE OF THE CONSULTATION DOCUMENT

The following section of the consultation outlines the analytical framework the TRA proposes to use in conducting its analysis of whether to issue additional mobile licences in the Kingdom of Bahrain. This section sets out why additional competition could be expected to be beneficial.

As a first step in understanding how the market may evolve under a scenario of additional entry, it is necessary to understand the current state of the mobile market in Bahrain. Section 3 therefore reviews the current state of the mobile market in Bahrain, including indicators of the current level of competition.

Taking into account the analytical framework outlined in Section 2 and the current state of competition in the market, Section 4 outlines the possible impact of additional entry into Bahrain’s mobile sector. In particular, this focuses on:

- the possible impact on price levels for mobile services;
- the possible impact on the quality of services offered;
- the possible impact on the range of products and services offered;
- the possible other benefits that additional entry to the mobile sector might bring to the economy of the Kingdom of Bahrain; and
- the possible impact on the financial viability of existing mobile operators.

For each of these factors, the potential impact of either the possible entry of a third MNO and/or the entry of one or more MVNOs is outlined.

In a number of areas the TRA is still collecting and analysing relevant data and information and has therefore not reached a view as to the possible impact of further entry. In these cases the consultation document sets out the approach which the TRA intends to follow in order to reach its viewpoint.

The TRA has not yet reached a decision on whether additional mobile licences should be issued, and if applicable, what form that entry should take. The purpose of this consultation is to further the TRA’s understanding of the issues at stake and to offer stakeholders the

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opportunity to comment at an early stage in the process. However, the TRA considers that, should it decide to allow further entry into the sector, a number of other practical issues will need to be addressed. These include:

- the amount and range of frequency spectrum that should be issued to any new MNO;
- ensuring any MVNOs have access to the mobile network of one of the network operators;
- the possibility of offering national roaming services to a new network operator;
- a consideration of mobile number portability; and
- the process that should be used to award any new licence(s).

In Section 5 of this consultation document the TRA discusses these issues and, where appropriate, its initial views. The TRA invites comments from interested parties on all of these issues.

Finally, Section 6 provides a glossary of the terms used in this consultation document, and Section 7 provides a list of all the consultation document questions.

1.5 NEXT STEPS

This consultation is open for public comment as of 3 July and will close on 3 August.

Once it has received and considered responses to the questions in this consultative document, the TRA may, if it considers it appropriate, in due course present in a second consultation document its proposals as regards further entry to the mobile sector. If it considers that this would not further any issues it may proceed to make a final decision. After consultation and the publication of a final decision, official announcements will be made concerning the availability of a further licence or licences, application timetables, and other related issues. No relevant licence applications will be accepted at any stage prior to such announcements and any application received will be rejected as untimely.

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2 The analytical framework

This section of the consultation document sets out the framework that the TRA proposes to use in reaching its decision with regard to possibly issuing further licences in the Kingdom's mobile telecommunications sector. It describes the trade-offs that might influence the TRA's decisions in this matter and how the TRA proposes to analyse these trade-offs. In particular, it considers:

- a possible trade-off between the benefits that might arise from allowing further entry into the sector and any possible adverse impacts this might have; and
- how the possible entry of MVNOs, as opposed to (or as well as) MNOs, might impact this trade-off.

2.1 THE TRADE-OFF BETWEEN THE POTENTIAL BENEFITS AND COSTS OF COMPETITION

As set out above, one of the objectives of the TRA is to promote effective and fair competition in Bahrain's telecommunications sector. Therefore, in determining whether to allow further entry into the mobile sector, the TRA will have to assess not only the current state of competition but also how competition may be expected to develop with and without the issue of further licences.

In a competitive market, producers may look to offer propositions distinct from those of their rivals, in order to meet the demands of consumers. Strong competition in a given market is expected to increase consumer welfare as prices fall towards cost and firms introduce innovations and seek efficiency improvements. For these reasons, governments have over recent years sought to promote the development of competition in the provision of telecommunications services. For example, following a trend seen in a number of other markets worldwide, all sectors of the telecommunications market in Bahrain have now been liberalised.

The mobile sector in Bahrain is currently a duopoly, with two network operators (Batelco and MTC-Vodafone) providing mobile services in the Kingdom. By issuing additional licences, the number of players in the sector could increase, thus potentially leading to an increase in the intensity of competition in the market. This could lead to:

- consumers facing lower prices for mobile services;
- improvements in the quality of services offered to consumers; and
- increased innovation in the mobile sector, leading to a greater range of products and services on offer.

In assessing whether to allow further entry into the mobile sector the TRA will thus take into account the likely impact on competition and consumer welfare, and in particular consider the three factors outlined above. Furthermore, issuing additional licences (and the potential increase in competition that could result from this) could generate other

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indirect benefits for the Kingdom's economy. These should also be taken into account when determining whether or not to issue additional licences.

However, the TRA is aware that there may be some costs to issuing additional mobile licences. The primary cost is the possible loss of economies of scale (or unnecessary inefficient replication of infrastructure) that might arise from additional entry into the mobile sector. Should the entry of additional players into the sector result in a reduction in the economies of scale enjoyed by the existing mobile operators (or in existing operators enjoying lower economies of scale compared to what they would enjoy absent entry), this could lead to an increase in the average cost of mobile services (all other factors being constant). This could be expected to have a detrimental impact on the operators and, ultimately, on consumers.

An additional potential cost is the possibility that additional entry could reduce the incentives for investment, in particular if access to the infrastructure of existing operators is mandated at terms which could disincentivise future investment.

In determining whether it is appropriate to issue additional licences, the TRA therefore proposes to consider both the costs and benefits of market entry. In particular, it will consider whether the potential benefits to consumers (in terms of lower prices, improved quality of services and increased innovation) and the wider economy, outweigh the potential impact on the economies of scale of mobile operators and their incentives to invest. The TRA considers that it would be appropriate to issue additional licences if the benefits of additional entry are likely to outweigh these costs. At the same time, the TRA believes that there should be a presumption in favour of allowing entry and additional competition, and allowing market players to determine the feasibility of entry (rather than the TRA). Any arguments that entry might lead to net costs for the economy as a whole need therefore to be demonstrated, to be powerful and to be based on firm evidence.

To analyse these potential benefits and costs, it is first necessary to understand the current structure and state of the mobile market in Bahrain. Knowledge of the current state of the market enables an assessment of how the market may evolve under a scenario of additional entry. Therefore, the following section (Section 3) of this consultation document sets out the TRA's understanding of the current state of the mobile market in Bahrain. Section 4 then sets out how the possible entry of a third MNO and/or the entry of one or more MVNOs might influence the factors listed above.

2.2 THE POSSIBLE IMPACT OF MVNO ENTRY ON THIS TRADE-OFF

The TRA may issue licences to additional mobile network operators (MNOs) and/or mobile virtual network operators (MVNOs). In reaching its decision regarding the type of entry to allow, the TRA needs to consider

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the potential impact of both MNO and MVNO entry on the trade-off outlined above.

In providing a framework for this analysis, we first define what is meant by an MVNO, and then move on to a consideration of how MVNO entry might impact the trade-off set out above.

2.2.1 Mobile virtual network operators

There is no universal definition of MVNOs, but in general public mobile telecommunications service providers that do not hold an assignment of spectrum and have no or limited network infrastructure (but which do issue SIM cards and have an assignment of numbers) are considered to be MVNOs. An MVNO is therefore at least partially dependent on the mobile network of a host operator with whom it will enter into an access and services agreement. Such an agreement can benefit the host network as it will receive additional revenue from the carriage of traffic to and from the MVNO's customers and other service income to help finance the cost of the mobile network.

The degree to which an MVNO is dependent on host networks can vary. An MVNO may:

- rely on the radio access network of the host operator but self-provide certain other key network elements, such as mobile switching centres or an IN (intelligent network) infrastructure; taking traffic off the host network at given points to convey it through these network elements;
- purchase a "bearer service" from the host operator over the entire host network, only self providing its own home location register (HLR); or
- purchase end-to-end service from the host operator, only providing its own content and billing functions, effectively reducing its role to that of a (pure) reseller.

Other arrangements are also possible. However, at a minimum, an MVNO will typically control branding, marketing, billing, customer care and customer support (although it may outsource aspects of some of these functions to the host operator (or others)).

The Law does not define the technical characteristics of an MVNO. The TRA does also not propose to define the technical specifications for any MVNOs that may enter the market, but rather intends to leave this to the market participants. Consequently, the TRA proposes that any public mobile telecommunications service provider that does not hold an assignment of spectrum would be classified as an MVNO.

2.2.2 The impact of MVNO entry

In considering the case for allowing MVNOs to enter the market, the TRA proposes to take into account the same factors as those set out above in

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Section 2.1. MVNO entry may be characterised, to some degree, as service-based entry, leading to a promotion of service-based competition. This potentially contrasts with MNO entry, which will lead to further infrastructure-based competition. Such infrastructure-based competition can lead to competition at both the network and service levels. The TRA generally considers that, over the longer term, the promotion of infrastructure-based competition is likely to yield the greatest benefits for Bahraini consumers and the Bahraini economy.

In reaching a decision regarding whether to issue additional mobile licences (and the form such entry should take), the TRA proposes to take into account:

- the indicative benefits and costs of each form of entry; and
- the likely demand for both MNO and MVNO licences.

MVNO entrants may be less likely to constrain any economies of scale currently enjoyed by existing network operators. Indeed, by increasing service competition and providing new and better quality services, MVNOs may expand the market overall and create greater economies of scale for network providers. For example, in other countries MVNOs have been able to tap into previously under-served segments of the market and have generated additional traffic for network operators. As such, whilst MVNOs may create less comprehensive competition than MNOs, there would seem to be fewer potential costs from MVNO entry.

On the other hand, if MVNO access to the infrastructure of existing operators is mandated at unfavourable terms for the existing operators, this could potentially affect negatively the incentives for future investment by the existing MNOs.

The TRA therefore regards it as very important to receive views on these issues at this stage and to understand how potential competitors themselves, as well as existing operators, assess the possibilities for entry to the market.

Question 2.1:

- Please set out whether you agree with the proposed analytical framework of the TRA and in particular the nature of the likely trade-offs outlined by the TRA in this Section of the consultation.

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3 Current state of the mobile market in Bahrain

Section 2 of the consultation document has set out the approach the TRA proposes to take in assessing the merits of introducing further competition into the mobile sector in Bahrain. In order to conduct the proposed analysis, the TRA needs to make an assessment of the expected impact of further entry. The first step in doing this is to understand the current state of the mobile market in Bahrain.

This section of the consultation document presents evidence on the current state of the mobile market in Bahrain, including the current state of competition in the market. This is then used as the basis for the TRA's analysis as proposed in section 4 of the consultation document, regarding the potential impact of introducing further competition.

In this section the TRA considers the key relevant features of the current state of the mobile market in Bahrain, namely:

- mobile penetration and recent trends in mobile penetration growth;
- price levels for mobile services in Bahrain – both since MTC-Vodafone entered the market and in comparison with tariffs in other countries;
- the quality of mobile services offered in Bahrain; and
- the range of services offered by the existing mobile operators.

The remainder of this section discusses each of these factors in turn.

3.1 MOBILE PENETRATION IN BAHRAIN

The most recent data available to the TRA indicates that the number of cellular mobile customers in Bahrain in December 2005 was 767,103. Of these, 202,353 (26%) were with MTC-Vodafone and the remainder, 564,750 (74%), were Batelco customers (Figure 1). The majority of mobile customers in Bahrain (83%) are pre-pay customers.

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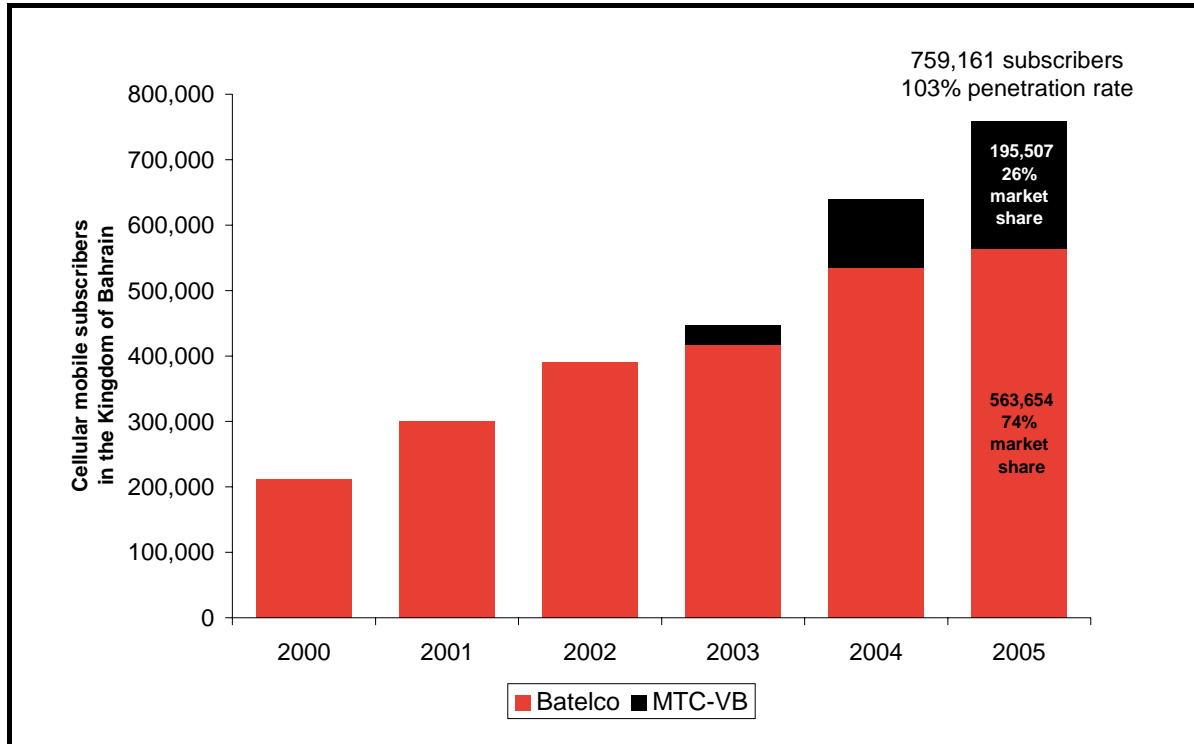


Figure 1: Number of mobile subscribers and market share by operator 2000 - 2005

Source: Data up to the end of 2004 is taken from the Globalcomms database (www.telegeography.com). Data for 2005 is up to October of that year and has been provided by the mobile operators.

Figure 2 illustrates how the growth in mobile customer numbers translates to the change in mobile penetration over time. The figure shows that the October 2005 number of customers of 759,161 represents a mobile penetration rate of 103%⁵. The TRA also notes the potential impact that entry can have on development of a mobile market. Figure 2 shows that following the entry of MTC-Vodafone in Bahrain in late 2003, the growth rate of mobile penetration increased significantly – from an average annual growth rate in the subscriber base of less than 20% (2002/2003) to an average annual growth rate in excess of 40% (2003/2004).

A mobile penetration rate in excess of 100% implies that some mobile users have more than one SIM card. For example, mobile customers may opt to use different SIM cards for business use and for personal use, or for making calls to different networks. As such, a penetration rate of 100% does not necessarily imply the market has reached a 'penetration ceiling'.

⁵ Precise estimates of the size of the population in Bahrain in 2005 are currently unavailable, and different sources will provide different estimates. The population figure used here to estimate penetration, 739,373, is based on the assumption that the population grew by 2% between 2004 and 2005 – this was the population growth rate for Bahrain between 2003 and 2004 according to the World Development Indicators data (World Bank).

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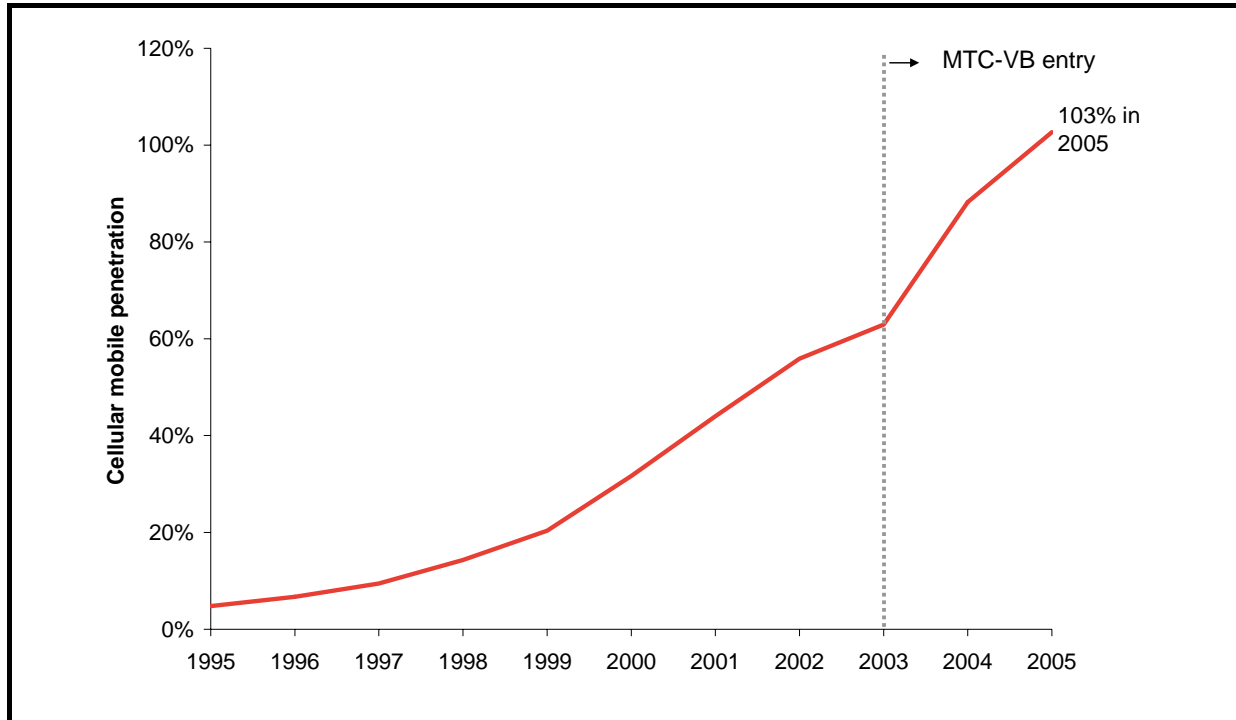


Figure 2: Cellular mobile penetration 1995 – 2005

Source: ITU, GlobalComms and Operator data

Figure 3 compares the level of mobile penetration in Bahrain in 2005 with the level of mobile penetration across a sample of countries. The figure shows that there are a number of other countries where mobile penetration has continued to grow beyond 100%, for example: Luxembourg (150%), Italy (111%), Norway (109%), Hong Kong (106%), the Czech Republic (105%), and the United Kingdom (103%)⁶.

⁶ Source: GlobalComms database (www.telegeography.com) for non-EU countries, and the EU 11th implementation report for EU countries. All data is for September/October 2005.

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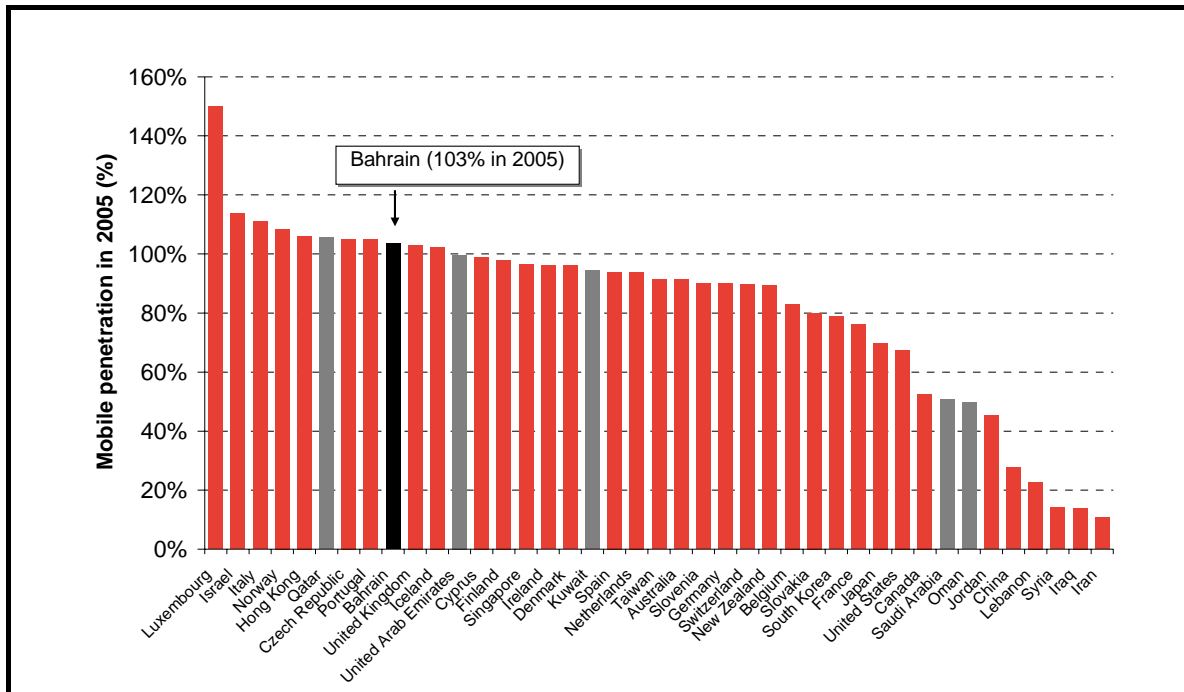


Figure 3: Comparing mobile penetration in Bahrain with other countries

Source: GlobalComms database (www.telegeography.com) for non-EU countries, and the EU 11th implementation report for EU countries. All data is for September/October 2005.

Figure 3 also shows that the level of penetration in Bahrain is higher than most of the other Gulf States, Qatar being the exception with a penetration rate of 106% in 2005.

3.2 THE PRICE OF MOBILE SERVICES IN BAHRAIN

The introduction of further competition in Bahrain’s mobile sector could have a significant impact on the prices consumers pay for mobile services. In order to quantify the potential impact, the TRA needs to understand the current scope that exists for prices to change, and to what extent a new operator could be expected to change the competitive landscape in the mobile sector. To conduct this analysis, the TRA first needs to understand the relative level and structure of mobile prices in Bahrain.

There are two parts to this section. The first part compares mobile prices in Bahrain with mobile prices in other countries. The second part looks at how the price of mobile services in Bahrain has changed over time, with particular reference to any changes in prices since the announcement of the entry of MTC-Vodafone into the market.

3.2.1 Cross-country comparison of current mobile prices

This section compares the average price mobile customers in Bahrain have to pay for a given level of mobile usage, with the average prices

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mobile users in other countries have to pay for the same level of usage. Initially the comparison looks at domestic call charges for pre-pay and post-pay services, followed by a separate comparison of international call prices.

Comparison of domestic tariffs

The cross-country comparison of domestic mobile tariffs requires the construction of 'usage baskets'. The OECD publishes low, medium and high user usage baskets⁷ for mobile telephony services, and these have been used widely to compare mobile tariffs across countries. The TRA has considered these baskets in its comparison of domestic mobile tariffs in Bahrain and comparable jurisdictions. Pre-pay customers typically make fewer calls than post-pay customers, and the TRA has also reflected this in its tariff comparison. For its pre-pay tariff comparison the TRA considers that the OECD medium user basket most closely reflects mobile usage patterns in Bahrain, and has therefore based its pre-pay tariff comparison on the OECD medium user basket. In other markets, the TRA is aware that post-pay customers may use up to three or four times the volume of calls of pre-pay customers. As such, for the post-pay tariff comparison, the TRA has used a usage basket three times greater than that which it uses for pre-pay customers⁸.

Table 1 summarises the usage basket for pre-pay and post-pay customers that the TRA has used in its analysis. In estimating the average cost of a usage basket across different countries, we assume that the average user of pre- or post-paid services in each country consumes the amount of minutes shown in Table 1.

⁷ A usage basket describes the (monthly) usage of a mobile customer, in terms of the volume of different types of calls and messages made and sent by the customer. Further information on the OECD usage baskets can be found in Annexe 2, Section 10.4 of the European Commission's 11th Report on European electronic communications' regulations and markets.

⁸ In its February 2006 Communications Market Interim Report, Ofcom states that post-pay customers typically spend four times more per month on mobile services than pre-pay customers. Given that pre-pay call charges are typically higher (on a per minute basis) than those for post-pay, this suggests that post-pay average usage is also considerably higher than pre-pay.

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	Pre-pay customer Monthly call minutes	Post-pay customer Monthly call minutes
Mobile to mobile	92	277
Mobile to fixed	26	79
Total call minutes	119	356
Total SMS per month	50	150

Table 1: Definition of usage baskets for cross-country tariff comparisons

Source: TRA

Figure 4 shows the cross-country comparison of the average monthly cost (US\$) of consuming the basket of services shown in Table 1 for a pre-pay customer. Figure 5 shows the cross-country comparison of the average cost (US\$) of consuming the basket shown in Table 1 for a post-pay customer. The estimated monthly cost includes monthly rental charges. The comparison is based on advertised headline tariffs for all operators in the country sample for February 2006. The comparisons show the monthly cost of consuming the basket of services, assuming a prospective customer will select the best tariff on offer. The criteria for choosing the countries in the comparison sample are:

- Relatively well-developed economies, to compare with Bahrain;
- Relatively well-developed mobile sectors, in line with the mobile sector in Bahrain – the main indicator in this case is the level of mobile penetration;
- Regional comparators;
- Similar demographic and geographic characteristics to Bahrain.

The TRA notes that not all of these criteria will apply to all of the countries in the sample. However, the TRA has strived to ensure that at least two of the criteria apply to each country in the sample.

For pre-pay customers, the average monthly cost for Bahraini mobile customers is US\$11. This compares with an average monthly cost across all countries of US\$20. Comparing Bahrain with the region, on average the monthly costs are lower in Bahrain, with the average for GCC states equal to US\$15.

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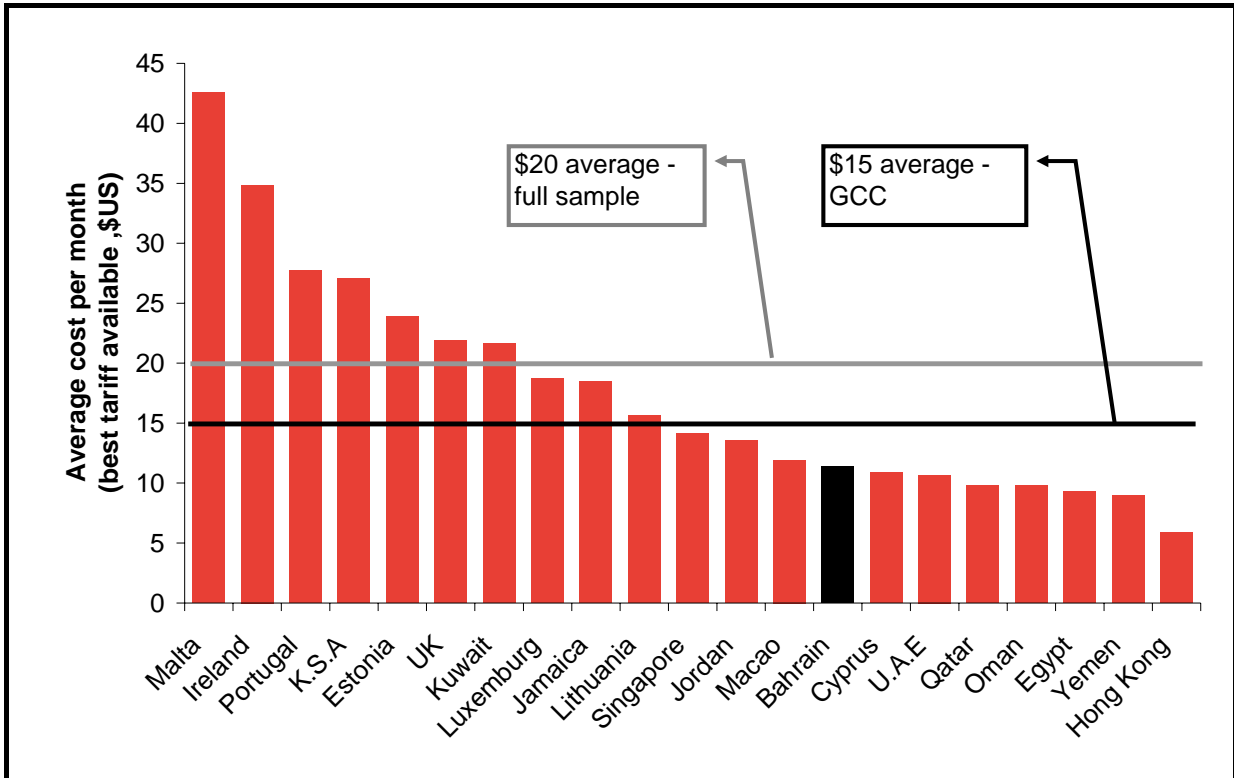


Figure 4: Pre-pay customers – Price basket comparison

Source: Operators' websites and TRA analysis, February 2006

With respect to post-pay customers (Figure 5), the monthly cost for Bahraini customers - US\$49 - is nearly equal to the average in the sample, US\$50. The average monthly cost for post-pay customers in the GCC states is US\$49.

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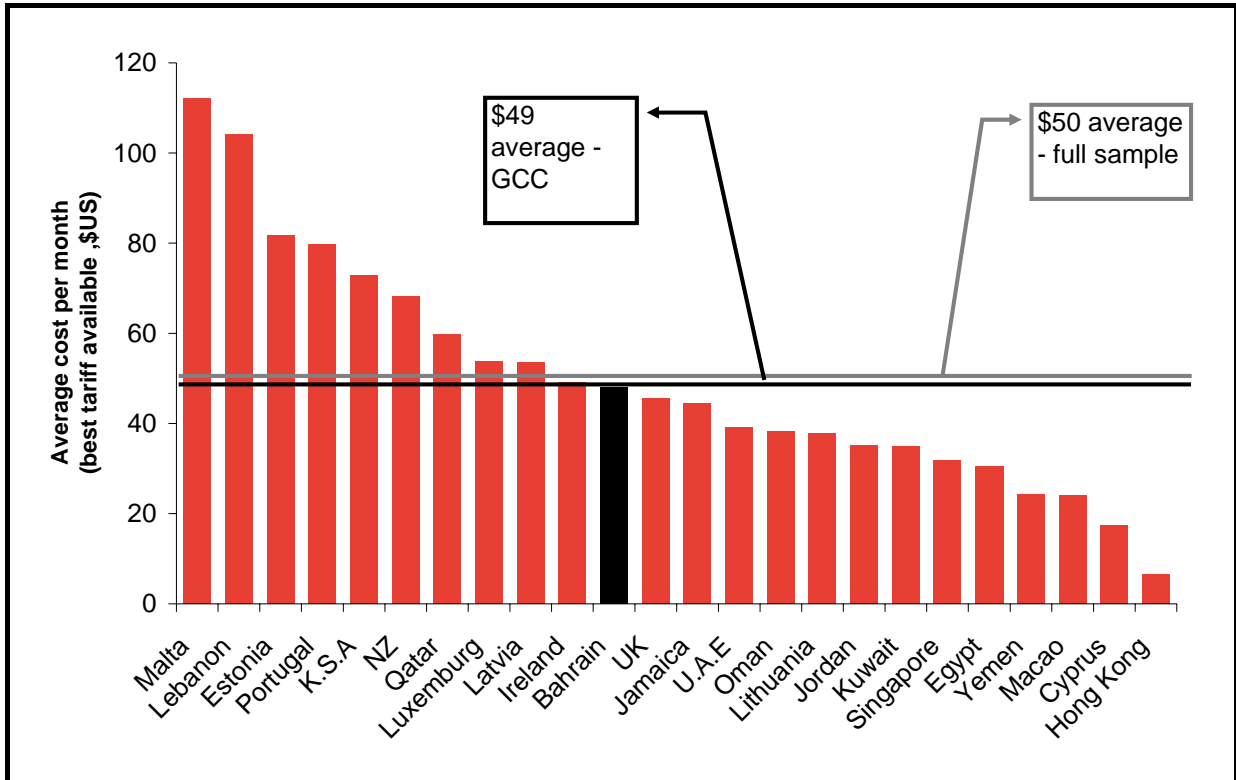


Figure 5: Post-pay customers – Price basket comparison

Source: Operators' websites, February, 2006

Cross-country comparison of international tariffs

There is a relatively large population of foreign workers living and working in Bahrain, many of whom would account for a large part of the subscriber base for the two mobile operators⁹. Therefore, international calling costs may account for a significant proportion of the overall mobile services costs many customers face. In this section we compare the average cost of making an international direct dial (IDD) call from a mobile phone in Bahrain, with mobile IDD rates in other countries. This uses the same sample of countries as that included in the comparison of domestic tariffs shown above, and focuses on the leading operator (by market share) in each market. As above, it is based on the headline tariffs advertised on each operator's website in February 2006.

Figure 6, Figure 7 and Figure 8 compare the cost of making a mobile IDD call to the USA¹⁰, a neighbouring country (GCC states in the case of

⁹ In 2004, it was estimated that some 38% of the total population of Bahrain was non-Bahraini (Kingdom of Bahrain: *Central Information Organisation*, cited in <http://www.education.gov.bh/english/geneva/pdf/Bakground-Information.pdf>). The majority of these, up to 25%, are Pakistani or Indian workers living and working in Bahrain. The remainder are mainly other Arab and European workers.

¹⁰ The comparisons for the USA (Figure 6) and Pakistan (Figure 8) are based on the price per minute of calling either of these countries for one minute, assuming the caller is with the leading operator in the home country. For calls to a neighbouring country we have identified the cost of calling the closest geographic neighbour of each country in question,

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Bahrain) and Pakistan respectively. The motivation underlying the choice of these three countries is as follows:

- a significant proportion of the immigrant working population in Bahrain are either Pakistani or Indian, and therefore a significant proportion of mobile IDD calls are likely to be to these countries;
- several million tourists visit Bahrain each year, the largest proportion of which come from neighbouring countries in the Gulf; and
- the USA is a major trading and business partner for Bahrain, and therefore the USA is also selected as one of the comparators.

For calls to the USA and neighbouring countries, mobile outgoing calls in Bahrain are around the average for the sample. For calls to Pakistan, calls from a Bahraini mobile are cheaper than the average, US\$0.68 as compared with an average of US\$1.19.

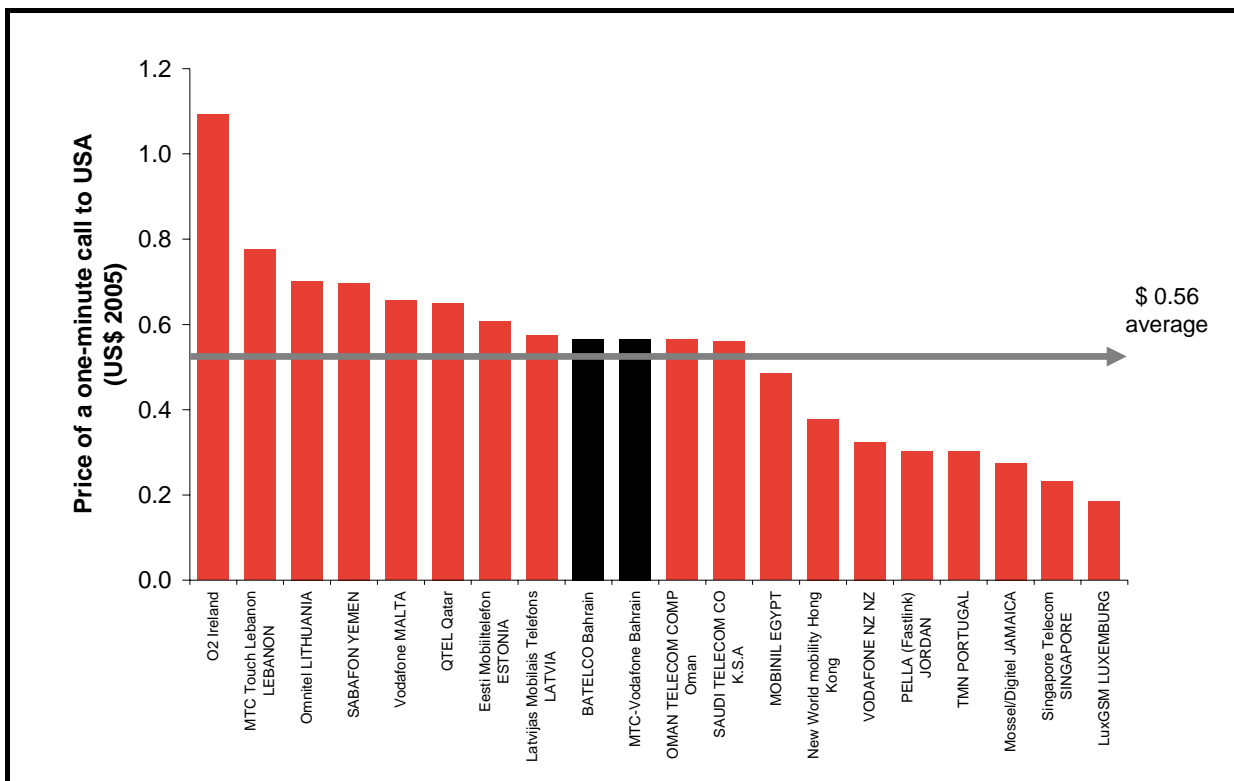


Figure 6: International direct dial (IDD) to the USA – Price comparison

Source: Operators' websites and TRA analysis, February 2006

with the exception of the Gulf States, where 'neighbouring country' means any GCC country.

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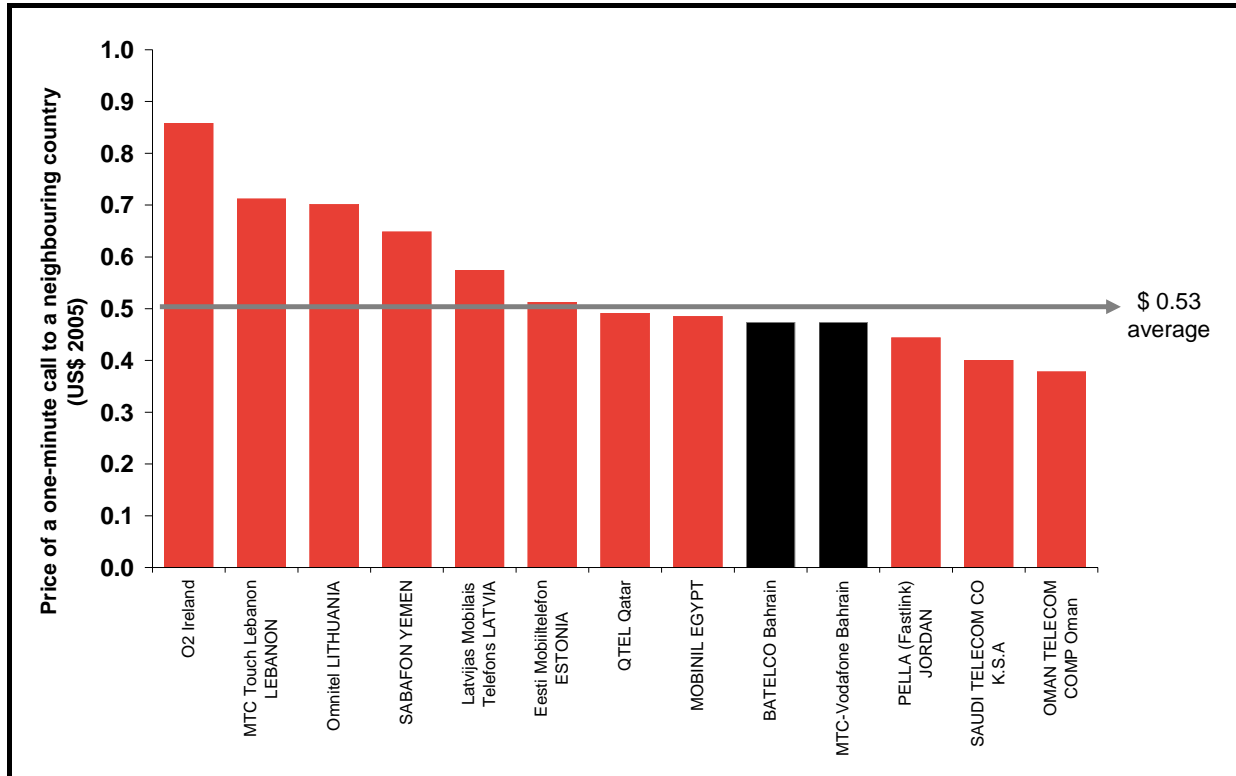


Figure 7: International direct dial (IDD) to a neighbouring country – Price comparison

Source: Operators' websites and TRA analysis, February 2006

Notes: Calls to a neighbouring country are defined as calls to Kuwait/U.A.E. for GCC member states, Germany for EU member states and Australia for New Zealand. Tariffs are the unweighted average of peak and off-peak prices.

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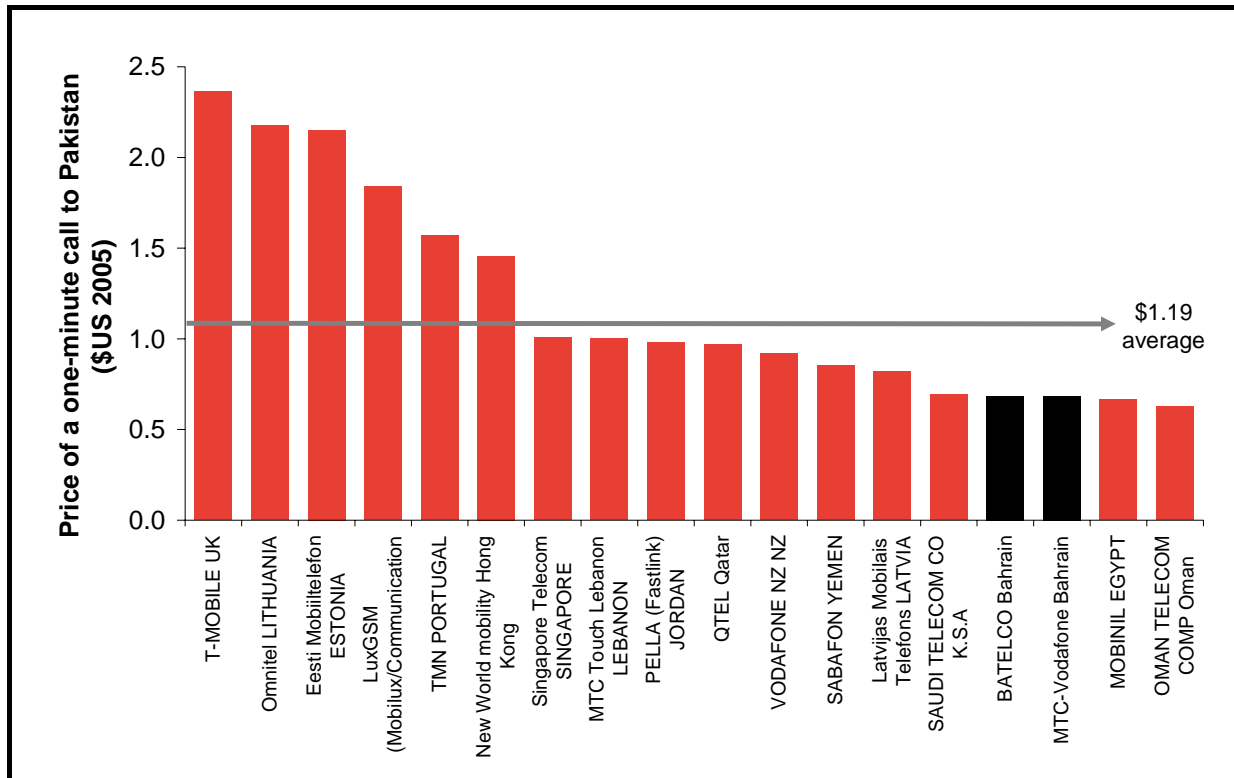


Figure 8: International direct dial (IDD) to Pakistan – Price comparison

Source: Operators' websites and TRA analysis, February 2006

Question 3.1:

- To what extent do respondents consider that the usage baskets and comparators employed by the TRA in this analysis are appropriate?
- Should the TRA consider further analysis of comparative price data, and if so, what should this analysis cover and why?

3.2.2 Changes in mobile tariffs over time

Experience from the strengthening of competition in other mobile markets suggests that competition, or the threat of competition, can often lead to significant downward pressure on prices. For example, mobile operators may not only compete on “headline” prices (e.g., by reducing the charges on existing packages), but may also use a number of other forms of competition. For example, operators may introduce new service packages (with lower implied tariffs and/or a greater number of free minutes) in order to attract new customers. Similarly, operators might also introduce temporary discounts and promotions to headline tariffs.

When MTC-Vodafone entered the Bahraini market at the end of 2003, it did so at a competitive price offering relative to Batelco. For example, from the time of entry in 2003, registration for prospective MTC-Vodafone

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pre-pay customers was free, as compared with a headline rate for prospective Batelco customers of BD5¹¹.

The TRA must currently approve any proposed changes in the mobile tariffs of Batelco (including the introduction of promotions and discounts). In this role, and as part of monitoring the developments in the mobile market, the TRA is aware that Batelco has offered a number of promotional and discount tariff schemes since MTC-Vodafone entered the market. The TRA may not be fully aware of the extent to which MTC-Vodafone might have responded to these promotions and discounts by introducing its own offers.

Despite introducing a number of promotions and discounts, Batelco has largely not reduced the headline tariffs on any of its tariff packages. Research conducted by the TRA in preparation for this consultation suggests that MTC-Vodafone has also largely left its headline tariffs unchanged since its entry into the market.

Question 3.2:

- To what extent do respondents consider that there currently exists a significant degree of price competition in the provision of mobile services in Bahrain?

3.3 QUALITY OF SERVICE

In considering the “quality of service” offered by mobile operators, the TRA is interested in reviewing both the quality of network services (e.g., network availability) and also the quality of customer services (such as the accuracy of customer billing and response to customer complaints).

The level of service quality on the network can be gauged by a number of measures, such as availability, grade of service¹², call dropping rates and call blocking rates. In this respect, both MTC-Vodafone and Batelco must meet minimum quality of service standards, as set out in Clause 9 of their respective operator licences, namely that:

- The licensee shall provide the licensed services twenty-four hours per day, seven days per week. Over any ninety (90)-day period, the mobile telecommunications service shall be available at least 98% of the time; and
- The mobile telecommunications network shall maintain a busy hour call completion rate of at least 95% averaged over any ninety (90)-day period.

¹¹ Based on historical tariff data supplied by the operators to the TRA.

¹² Grade of service can be defined in a number of ways. The typical definition measures the proportion of calls that are lost due to congestion in the busy hour of the day.

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In addition, both mobile operators are required to provide the TRA with statistics on these and other quality of service metrics. The statistics that are currently available to the TRA suggest that the operators are achieving in excess of their minimum requirements for network quality of service.

The mobile operators also provide the TRA with a range of other quality of service measures, such as mobile call centre performance, customer satisfaction ratings and the resolution of billing disputes. The information available to the TRA shows that customer service and customer satisfaction have generally increased during 2005. However, it has not been possible to compare the level of customer service provided by the mobile operators in Bahrain with the level of customer service provided by mobile operators in other jurisdictions.

Question 3.3:

- a) To what extent do respondents consider that the mobile operators are currently providing a reasonable level of (network) quality of service?
- b) To what extent do respondents consider that the mobile operators are currently providing a reasonable level of customer service?

3.4 THE RANGE OF MOBILE SERVICES OFFERED IN BAHRAIN

The range of mobile services available to consumers in Bahrain has grown significantly in recent years. This is likely to have stemmed both from advances in technology and the impact that competition has had on the market. This mirrors developments in a number of other markets.

For example, both Batelco and MTC-Vodafone offer access to high-speed data services through EDGE networks, whilst MTC-Vodafone also offers access via its third generation network. Both operators provide mobile data portals through which consumers can gain access to a range of services (such as news and sport updates, ring tone and wallpaper downloads, and other content), as well as email and instant messenger services. Both operators also offer value-added features for call services, including caller identification, call waiting, conference call facilities and voicemail, together with corporate services such as Bulk SMS. In addition, through its third generation network, MTC-Vodafone offers video calling to its 3G customers.

Question 3.4:

- To what extent do respondents consider that mobile operators in Bahrain offer similar ranges of services to those offered by mobile operators in other jurisdictions?

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3.5 SUMMARY

In this section of the consultation document, the TRA has reviewed its understanding of the current state of the mobile market in Bahrain. The TRA welcomes the comments of stakeholders in this regard.

Question 3.5:

- Are there any other factors the TRA should consider in its review of the current state of the mobile telecommunications market in Bahrain?

4 The possible impact of further entry into the market

As set out in Section 2, in determining whether it is appropriate to allow further entry into the Kingdom's mobile sector, the TRA will consider whether such entry is likely, overall, to be beneficial, both to consumers and the Bahraini economy. This section of the consultation document sets out how the possible entry of a third MNO and/or the entry of one or more MVNOs might influence the development of the mobile market and wider economy in Bahrain.

4.1 INTRODUCTION

In order to gain market share, new entrants to a market typically attempt to offer a proposition distinct from those of existing market participants. For example, this may be achieved through the entrant:

- offering - in comparison to incumbent firms - lower prices for the goods/services in question;
- offering a greater range of products than the incumbent firms and/or an innovative take on the product in question; and
- offering an improved customer service, compared to that offered by the incumbent firms.

Consumers are typically considered to benefit from lower prices, a greater range of services and improved quality of services. Whilst those consumers who switch to the new entrant may directly benefit from the lower prices and improved service offering of the entrant, the remaining customers of the incumbent firms are also likely to benefit as the incumbents react to the entrant's strategy.

As a result, the potential extent of these benefits is dependent upon the likely impact of further entry into the mobile market on:

- price levels for mobile services;
- the quality of services offered; and
- the range of products and services offered.

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This Section of the consultation document therefore sets out the TRA's initial views on the likely impact of additional entry into the mobile sector in each of these areas. These benefits all relate directly to the mobile sector itself. As set out below, the TRA will also consider possible wider benefits to the economy as a whole.

The benefits listed above focus on the potential impact on mobile consumers of further entry into the sector. However, this entry might also have an impact on the suppliers of mobile services. The TRA will take this into account when making its decision, and also sets out in this Section its initial views on the likely impact of further entry on the existing mobile operators in Bahrain and the possible standing of a new entrant.

In a number of areas set out above the TRA is currently unable to reach a view as to how further entry might impact the market. In these cases the Section sets out the approach which the TRA intends to follow in order to reach its viewpoint.

4.2 IMPACT ON PRICE LEVELS FOR MOBILE SERVICES

As set out above, in an effort to gain a foothold in a market, a new entrant mobile operator might attempt to offer services at prices below those offered by the incumbent operators¹³. At the same time, incumbent operators might look to counteract the entry of a new operator by reducing prices just prior to the new operator's entry. As such, the period around the entry of additional players into mobile markets is often characterised by price reductions in the market (both from existing operators and new entrants attempting to undercut the prices offered by the existing operators).

For example, the TRA has considered the impact of entry on price levels in a number of markets outside Bahrain. Although no two markets are directly comparable, the TRA has observed occasions where additional market entry has been followed (or immediately preceded) by price reductions. For example, in both Ireland and Greece the entry of third mobile operators was associated with the new entrant offering lower tariffs than the incumbent operators and with incumbent operators responding by also lowering prices. Similarly in Luxembourg, where a third operator recently entered the market (and where penetration was in excess of 100% at the time of the third operator's entry), at least one of the incumbents has significantly reduced its tariffs since 2003.

International experience for entry is also supportive of the use of price discounts as a means of attracting and retaining customers. For example, in the UK, '3' has entered by offering significant price discounts. However, in considering the impact on price levels for mobile services of further entry into the sector, it is important to differentiate between long-term,

¹³ For example, this may take the form of a lower charge per call minute, reduced subscription/bundle charges, the inclusion of additional minutes within tariff bundles or a combination of these factors.

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sustainable price reductions and one-off price promotions at entry that are reversed soon after.

It is not necessarily the case that price reductions experienced elsewhere following entry would be repeated in Bahrain upon the entry of additional licensees. In considering the potential impact that entry might have on mobile prices in Bahrain, the TRA is mindful that it is necessary to consider the scope for such reductions. This, rather than the impact of entry elsewhere, will be used by the TRA as the primary indicator of the potential for further price reductions in Bahrain. To examine the potential scope for price reductions in Bahrain, the TRA intends to analyse:

- the current level of mobile tariffs in Bahrain compared to those in similar countries; and
- the profitability of the existing mobile operators in Bahrain.

The TRA proposes to use its review of international price comparisons and international experience, together with an analysis of the profitability of the existing mobile operators, to consider the potential impact of further entry on price levels for mobile services.

4.2.1 Relative prices for mobile services in Bahrain and comparable jurisdictions

The analysis of comparative mobile tariffs in Bahrain and other jurisdictions shown in Section 3.2.1 suggests that tariffs in Bahrain, whilst in line with the sample average, appear to be higher than those in a number of jurisdictions included in the sample. However, in determining the scope for tariff reductions it is also important to consider the extent to which the tariffs currently in place enable the existing operators to make a reasonable return on capital. Therefore, in determining the scope for further price reductions, the TRA also considers it necessary to analyse the level of profitability in Bahrain's mobile market.

4.2.2 The profitability of existing mobile operators in Bahrain

In a competitive market, prices should – over the long run – approximate efficient levels of economic cost. If prices are above efficient levels of economic cost there may be greater scope for future price reductions than if prices were to already reflect efficient levels of economic cost¹⁴. Consequently, the potential for future price reductions is likely to stem from:

- the degree to which the industry is currently making a return in excess of its cost of capital (i.e., the extent to which prices might be above current levels of economic cost); and

¹⁴ Even if prices are above efficient levels of economic cost, it may not be possible to profitably enter the market due to the existence of fixed costs, and the existence of other barriers to entry such as switching costs.

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- the scope for reductions in the cost levels of the operators, for example through improvements in efficiency.

In deciding whether or not further entry of MNOs or MVNOs would tend to bring prices into line with efficient costs, it will be important for the TRA to assess the degree to which excess profits may be currently be made in this sector¹⁵.

Regulatory accounting information can only provide a “static” view of profitability. When assessing the level of economic profitability of operators, allowance needs also to be made for the evolution of profitability over time. Typically, mobile operators exhibit losses in the period immediately after launch. These “start-up losses” are the result of a combination of relatively higher costs at launch, for example costs relating to sales and marketing, and relatively low revenues as the result of low subscriber numbers. In order to provide a reasonable return over the lifetime of the business, these “start-up losses” must be offset by increased profits later on in the business’s life cycle.

Thus a single year’s profitability does not provide conclusive evidence that prices are above or below economic cost. For example, in 2004, its first full year of operations, MTC-Vodafone reported losses of \$US 34 million¹⁶. As MTC-Vodafone’s subscriber base has grown, revenues have grown faster than costs, leading to a move towards profitability, with, for example, the EBITDA margin (Earnings Before Interest, Tax, Depreciation and Amortization) moving from -64% in 2004 to 25% in 2005¹⁷. Only by estimating profitability over the full life cycle of the business, rather than taking a snapshot of a single year, can we assess whether the level of profitability is above the return on capital employed.

In order to properly assess the level of profitability, the TRA will therefore assess profitability over a period of time. The TRA proposes to complement the information from separated accounts with a combination of data published by the operators and the data that is provided to it as part of its inquiry, supplemented where necessary with benchmark information from comparable markets.

Question 4.1:

¹⁵ As part of the regulatory accounting framework for the telecommunications sector of the Kingdom of Bahrain, each mobile operator must provide to the TRA separate accounts for its mobile network business and mobile retail business. At the time of preparing the consultation document, only the regulatory accounts for Batelco for the years 2003 and 2004 were available.

¹⁶ [http://www.mtctelecom.com/muse/obj/lang.default/portal.view/content/Investor relations/Presentations](http://www.mtctelecom.com/muse/obj/lang.default/portal.view/content/Investor%20relations/Presentations)

¹⁷ [http://www.mtctelecom.com/muse/obj/lang.default/portal.view/content/Investor relations/Financial Reports](http://www.mtctelecom.com/muse/obj/lang.default/portal.view/content/Investor%20relations/Financial%20Reports)

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- a) To what extent do respondents consider that there is scope for further price reductions in Bahrain's mobile market?
- b) To what extent do respondents consider that prices for mobile services in Bahrain currently reflect efficient economic costs of providing those services?
- c) How should the TRA assess the profitability of the existing mobile operators in Bahrain?
- d) Do respondents consider that there are other factors the TRA should take into account in its analysis of prices and profits?

4.2.3 The comparative impact of MNOs and MVNOs

As set out above, the TRA is considering the possibility of granting licences to mobile network operators and/or virtual network operators. The TRA considers that both the entry of network operators and virtual network operators could have similar impacts on the retail prices of mobile services, namely to put downward pressure on prices, although the magnitude of the potential impact could differ

Question 4.2:

- To what extent do respondents consider that the potential impact on mobile prices from MNO and MVNO entry may differ?

4.3 IMPACT ON THE QUALITY OF SERVICES OFFERED

New entrants to a sector might also compete on the quality of services offered to customers. This competition could also be expected to drive up the quality of services offered by existing operators as they attempt to match the entrant's performance.

An increase in service quality would be expected to increase consumer welfare. Thus, to the extent that the quality of service offered by mobile telecommunications licensees in Bahrain would be expected to increase following the introduction of a third network operator licence and/or MVNO licences, the welfare of consumers might also increase.

As described above in Section 3.3, the TRA regularly collects data from the operators to monitor the quality of services offered by the licensees and their compliance with the conditions of their licences. Data provided to the TRA suggests that mobile operators are currently exceeding these minimum requirements for network quality. The TRA intends to explore further possibilities for the benchmarking of quality of service.

An improvement in the quality of network services offered is likely to have greater impact on consumer welfare when the quality of the existing networks does not meet customer requirements, for example through high call dropping rates or network congestion. Given the current relatively high levels of network service quality offered in Bahrain, the TRA would not expect the quality of network service offered by mobile

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operators to be impacted significantly in the event of additional entry into the sector.

Question 4.3:

- Do respondents consider that further entry into the Kingdom's mobile sector might lead to an increase in the quality of mobile services offered in Bahrain?

4.3.1 The comparative impact of MNOs and MVNOs

As described below in Section 4, MVNOs do not deploy their own radio access networks, but rely instead on the infrastructure of the host network. In addition, and depending on the degree to which MVNOs self-provide core network infrastructure, MVNOs may also rely on other elements of the hosts' network. Therefore, MVNOs could typically be considered to focus on service competition, rather than infrastructure-based competition. As such, the TRA expects that, unless MVNOs were to self-provide large parts of their networks, the entry of MVNOs into Bahrain's mobile sector would not result in competition-led improvements in the quality of network services offered¹⁸.

Both MNOs and MVNOs are, however, likely to compete on the provision of final services to consumers. As set out below, the TRA believes that the entry of MVNOs into Bahrain's mobile sector may lead to innovations in the range of products and services offered. In addition, the entry into the sector of either MVNOs or MNOs could lead to increased competition in the provision of customer services (such as customer call centres, for example). This could also lead to an increase in consumer welfare.

Question 4.4:

- To what extent do respondents consider that the entry of MVNOs might impact on the quality of mobile services offered in the Kingdom?

4.4 IMPACT ON THE RANGE OF PRODUCTS AND SERVICES OFFERED

In order to provide a distinct proposition from its rivals, a new entrant might attempt to offer new and different products and services. The impact of this might then be to further spur the incumbent operators to also bring forward new service innovations. These new products and services could potentially encompass:

¹⁸ The TRA does however acknowledge that pressure from MVNOs on the network operators to improve network quality (and hence quality of service) could potentially lead to improved quality of service.

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- the introduction of new products (e.g., new mobile data products or content services);
- the introduction of new, and potentially more targeted, service packages and tariff bundles; and
- the introduction of services across a wider geographic area than they are currently available in.

The range of mobile services available to consumers, both in Bahrain and elsewhere, has grown substantially in recent years. However, research suggests that the range of tariff packages and bundles has not increased significantly since the entry of MTC-Vodafone into the market.

The third aspect of product and service innovation set out above relates to the expansion of network coverage that may arise from the increased competition that is brought about by additional market entry. Typically, this is likely to be most important in markets where there is not universal coverage at the time the new operator enters the market. Batelco and MTC-Vodafone's networks currently provide coverage across the Kingdom of Bahrain and as such the TRA does not consider that the entry of a third network operator would be likely to materially increase geographic coverage.

Once operators complete their geographic roll-out, they may begin to compete on other aspects of network coverage, such as in-building coverage. As such, the quality and degree of network coverage may still be a competitive factor in Bahrain's mobile market, despite the (almost) universal geographic coverage of the current networks.

Question 4.5:

- Do respondents consider that further entry into the Kingdom's mobile sector might lead to an increase in the range of products, tariffs and services on offer?

4.4.1 The comparative impact of MNOs and MVNOs

As set out below, MVNOs will, to a greater or lesser degree, rely on the infrastructure of the host network. Therefore, the extent to which an MVNO will be able to introduce new products and services that rely on the introduction of new technology or network upgrades, may depend on the ability of the host network to offer those services¹⁹. Similarly, MVNOs will not themselves play a direct role in further increasing the level and quality of network coverage (such as in-building coverage).

MVNOs might be expected to have an impact on the range of products and services offered using existing network technology that will be

¹⁹ The TRA does however acknowledge that an MVNO may play a role in promoting the introduction of new technology.

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comparable to the impact of network operators themselves. MVNOs may also be equally as able as network operators to offer innovative tariff packages and retail service bundles. For example, Virgin Mobile's entry into the UK mobile market led to the introduction of a number of new tariff schemes, whilst MVNOs in a number of jurisdictions have often targeted particular niche groups of customers.

Question 4.6:

- To what extent do respondents consider that the entry of MVNOs might impact on the range of mobile products and services offered in the Kingdom?

4.5 THE POTENTIAL IMPACT ON THE PROVIDERS OF MOBILE SERVICES

In reaching its decision regarding the possible introduction of further competition in the Kingdom's mobile sector, the TRA also proposes to take account of the possible impact of further entry on the providers of mobile services. In the following parts of this section the TRA takes into consideration the possible impact of additional entry on the existing mobile operators in Bahrain and also considers the potential attractiveness of the market to potential new entrants. The TRA will consider in its analysis whether further entry is feasible – that is, whether entry is likely to be profitable for potential entrants – and whether it is desirable – that is, whether entry would create a surplus of benefits over costs for the economy as a whole.

4.5.1 The potential impact on the existing mobile operators

The introduction of a third mobile operator licence might result in existing customers of Batelco and MTC-Vodafone switching to the third network operator. Given the current relatively high level of mobile penetration in Bahrain, this may lead to a reduction in the number of customers using each of the existing networks, possibly increasing excess capacity. In addition, some potential (currently unserved) customers who may take up a mobile service in the future might, under the scenario of additional entry, take service from the new entrant. In the absence of the new entrant, and assuming these consumers would still become mobile customers, these customers would have taken service from either of the existing operators. Thus in future the actual number of customers of the currently existing operators might be lower – under a scenario of market entry – than would otherwise have been the case.

Market entry may result in an operator serving a reduced number of customers, and/or having lower call volumes that would otherwise have been the case. In the presence of fixed costs and economies of scale within the cost structures of operators, this could lead to an increase in average unit costs for existing operators. Furthermore, where entrants

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and incumbent operators are investing in new products and services, and this investment is a fixed cost, the entry of a third operator may lead to the replication of fixed costs.

The potential magnitude of any such cost increase would be driven by three key factors. In assessing the possible impact of additional entry, the TRA has regard for each of these, as follows:

- the potential increase in average costs will be affected by the scale of any fixed costs present in the industry;
- the potential increase in average costs will be affected by the degree to which additional entry leads to a reduction in customers or call volumes for existing operators; and
- the potential increase in average costs will be affected by the type of entry under consideration.

The TRA is developing a financial model of the mobile sector in Bahrain to inform its view of the likely impact of additional entry on the existing operators and also the likely attractiveness of such entry. Below the TRA describes how each of these factors might influence this analysis.

The scale of fixed costs in the industry

Long-run average costs would increase with a reduction in the volume of outputs only if the provision of mobile telecommunications services exhibits economies of scale. This will depend on the nature of cost drivers of the business, with the degree of fixed costs likely to depend on:

- the costs of meeting minimum coverage requirements as set out in an operator's licence;
- geographic and demographic characteristics of the market in question. In densely populated areas, a greater proportion of network costs will be driven by traffic levels as opposed to coverage. This means that relatively few economies of scale in network costs would be expected in areas of high population density; and
- the costs of central office and board functions as a proportion of total costs. These costs are likely to be relatively higher in smaller markets.

The extent of such fixed costs (operational gearing) will be assessed by the TRA as part of the financial modelling carried out to assess the potential impact of issuing further licences. However, based on the cost data currently available to it, and its awareness of similar cost studies conducted elsewhere, the TRA initially considers that, in the long term, fixed costs are likely to represent a relatively low proportion of total mobile costs in Bahrain. Whilst the mobile operators in Bahrain must provide 95% population coverage in the licensed area, the population of Bahrain is concentrated in a relatively small area of the Kingdom, such that 95% of the population lives and works within 34% of the landmass of

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the Kingdom²⁰. As a result and as set out above, relatively few economies of scale would be expected in the provision of mobile services in Bahrain.

The impact of entry on the volume of services provided by existing operators

The scale of any increase in existing operators' long-run average costs will also be dependent on the impact the entrant has on the volume of services provided by the existing operators. This will be driven by the extent to which market entry displaces demand that would otherwise be served by the existing operators, versus the extent to which entry generates additional demand. Under a given level of fixed costs, market entry that largely displaces demand rather than generates additional demand is likely to have a greater impact on average costs for existing firms.

In estimating the likely level of displacement demand versus new demand for a new mobile entrant, the TRA proposes to take into account:

- the current level of penetration into the market;
- the potential increases in penetration and call volumes that result from price reductions that might occur as a result of market entry; and
- the extent to which new entrants might target service provision towards currently underserved sectors of the population.

The type of entry under consideration

The above suggests that the existing operators in the market may lose (retail) volumes and hence face higher average costs as a result of market entry. However, if entry takes the form of one or more MVNOs entering the market, the impact on economies of scale may be limited. Whilst an MVNO will compete for retail customers with the existing subscribers, it will not compete on the provision of all network services. Therefore an MNO that offers network access to an MVNO might not witness increases in network unit costs. Indeed, in a number of jurisdictions, MVNOs have entered the mobile market in order to focus on providing mobile services to previously underserved groups of customers. In these cases, the entry of an MVNO might not lead to a reduction in the output volumes of existing operators and instead benefit the network operator by also reducing its average unit network costs.

Question 4.7:

- Do respondents consider that further entry into the Kingdom's mobile sector might lead to a significant change in the average unit costs of

²⁰ "The opportunity for a second mobile telecommunications operator licence in the Kingdom of Bahrain", TRA December 2002.

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existing operators? (Evidence should be provided to substantiate the argument in either case.) Do respondents agree with the TRA about how this effect would be expected to differ between MNO and MVNO entry?

4.5.2 The potential attractiveness of the market to new entrants

The TRA is also undertaking to assess the potential attractiveness of the market to new entrants. A key factor in this analysis will be the ability of a new operator to profitably attract customers.

Given the relatively high level of mobile penetration in Bahrain, a new entrant may be more likely to attract to its service customers of the existing operators, rather than previously unserved customers.

The ease with which a new operator may gain customers is also likely to be related to a number of “institutional” factors within the Bahraini market. In particular, the introduction of mobile number portability may increase customer switching between networks. In addition, if a new network entrant were able to use an existing network (via national roaming) at the outset of offering services, this could enable it to offer a national service sooner than would otherwise be the case. This might also encourage customer switching. The TRA further considers both of these issues in Section 5.

In assessing the potential impact of introducing further competition into Bahrain’s mobile market, the TRA has also reviewed the size of mobile telephony markets in other relatively small jurisdictions. As shown below, in a number of relatively mature jurisdictions there are mobile phone network operators with similar - or indeed smaller - customer bases than those of operators in Bahrain. In all cases, the operators have been operational for more than two years and each market has at least two network providers. This suggests that the relatively small scale of the market in Bahrain may not be a barrier to the entry of additional operators.

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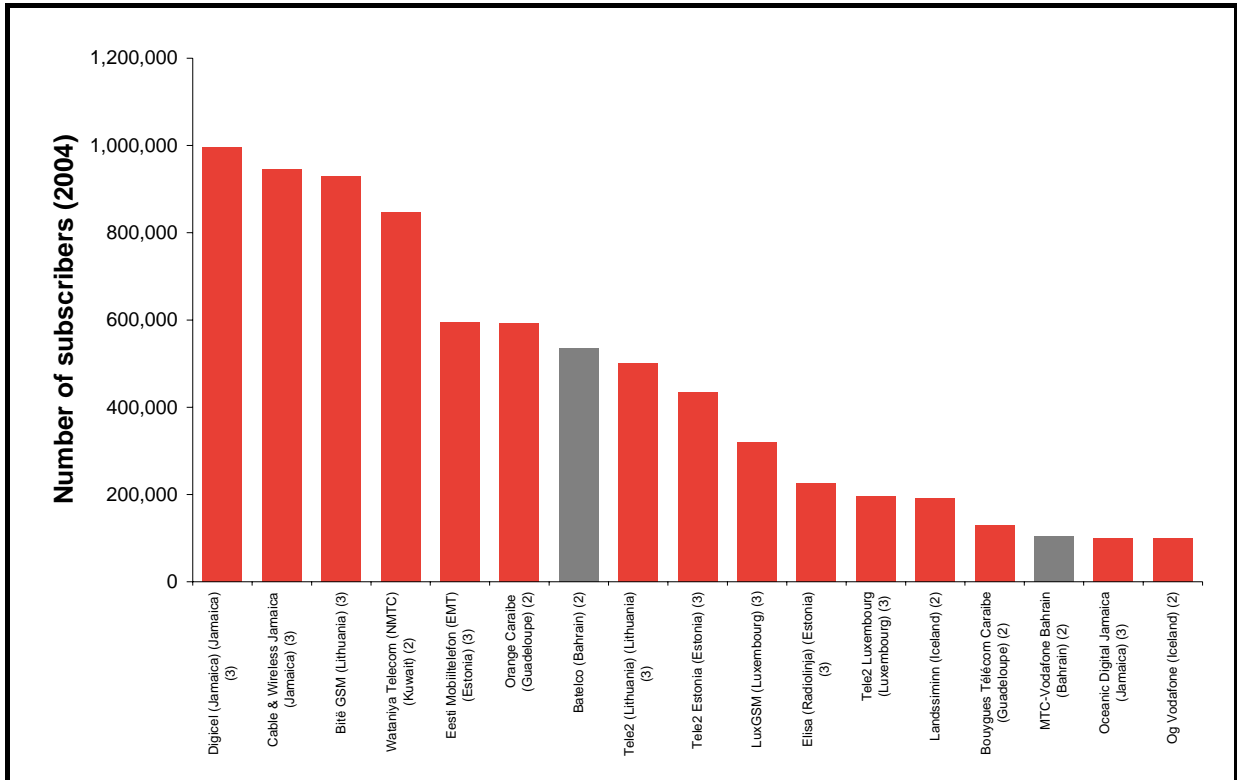


Figure 9: Mobile network operator (MNO) customers in 2004 in relatively smaller states²¹

Source: Globalcomms database (www.telegeography.com)

In addition, there are a number of relatively small jurisdictions in which there are at least three licensed mobile operators. A sample of such jurisdictions is shown in the table below²².

²¹ The chart also shows the number of operators present in each market. In all cases, the mobile operators shown in the chart have been active in their market for at least two years.

²² The TRA is aware of the fact that in a number of these jurisdictions, mobile operators may not deploy distinct mobile networks, but rather rely on infrastructure in neighbouring jurisdictions.

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Jurisdiction	Population estimate (million)	Number of mobile network operators
Kuwait	2.46	2*
Estonia	1.35	3
Luxembourg	0.45	3
Curacao	0.17	3
St Lucia	0.16	3
Aruba	0.07	3
Guernsey	0.07	2**

Table 2: Number of mobile licences in selected jurisdictions

Source: Globalcomms database (www.telegeography.com) & Regulatory Authority information

* The TRA understands that the Government of Kuwait is considering the issue of a licence to a third mobile network operator.

** The TRA understands that the Office of Utility Regulation (Guernsey) is currently awarding a second licence for 3G spectrum. This may result in a third network operator entering the market.

The relative attractiveness of market entry may also depend upon the business model considered by potential entrants. A greater level of investment is likely to be necessary for any entrant network operators than for any entrant MVNOs, although the level of investment required by MVNOs will depend upon the extent to which the MVNO uses the infrastructure of its host network.

Question 4.8:

- Are there any other factors the TRA should consider in assessing the potential attractiveness of the market to new investors?
- What are the views of respondents regarding the relative merits of MNO and MVNO entry?
- Should the TRA consider a period of 'exclusivity' for any further MNO licensee, similar to the one that applied when the second mobile licence was granted? Should the TRA consider any other measures to facilitate entry?

4.6 WIDER BENEFITS TO THE BAHRAIN ECONOMY

The entry of additional mobile operators may have other benefits for the Kingdom, outside of the direct benefits to consumers, which the TRA will also take account of in reaching its decision. These effects include:

- Effects on employment
- Productivity improvements and potential investment effects

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At this stage in the consultation, the TRA sets out its initial thoughts on the possible sources of these wider benefits. The TRA seeks views from interested parties on whether there are any further wider benefits that should be considered as part of the consultation.

4.6.1 Employment effects

The employment effects from the entry of a third mobile operator can arise through direct, indirect or multiplier effects. The direct effect is the immediate effect on employment following the entry of a third operator. The indirect effect is the effect that entry has on the demand for inputs to produce mobile services, which will in turn cause additional demand for the products that form those inputs. The multiplier effect measures the impact that the potential employment boost has on the aggregate compensation of employees and other incomes, which, in turn may cause further spending and, ultimately, increases in GDP.

4.6.2 Effects on productivity and investment

The potential productivity benefits from the introduction of a third mobile operator can be divided into the effect on the mobile operators and the effect on the users of mobile services. In this section the TRA considers the possible impact of any productivity improvements on the users of mobile services.

One of the more commonly cited benefits of mobile services is the productivity improvement that results from the use of such services. The productivity improvement can arise from a number of different sources, including: less unproductive time, faster and better decision-making and significant improvement in logistics. If increased competition in the Bahraini mobile market leads to more innovation and the introduction of new products (relative to the case with only two operators), then this could also provide a productivity boost for users of mobile services.

The main investment effects from the entry of a new operator would come through the boost in investment following the building of a new mobile network. The TRA believes the investment benefits from increased competition from an MVNO are likely to be limited.

Question 4.9:

- Are there any other potential benefits that the TRA has not included in its discussion set out above?

4.7 SUMMARY

In this section of the consultation document the TRA has set out its initial views on the likely impact of additional entry on the Kingdom's mobile sector. In particular, and as outlined above in Section 2, the TRA has concentrated on analysing the likely benefits that might arise as a result

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of the introduction of further competition, together with the possible impact on costs.

The TRA has yet to complete its analysis in these areas and would welcome further information and contributions from interested parties on the topics outlined in this Section. Nevertheless, its initial analysis outlined above suggests that:

- A significant benefit of the additional competition that further market entry may bring is likely to stem from a strengthening of price competition in the market;
- The range of mobile services currently offered in Bahrain compares favourably with those in other jurisdictions. As such, any improvements that further market entry could bring may be unlikely to add significantly to customer welfare; and
- Economies of scale in Bahrain's mobile market would be expected to be relatively limited.

Question 4.10:

- To what extent do respondents agree with the TRA's initial analysis, as outlined in Section 4 of the consultation?

5 Other issues to be considered

The TRA considers that, should it decide to allow further entry into the sector, a number of other practical issues would need to be addressed. The TRA outlines those issues here and invites comments on them from interested parties.

5.1 SPECTRUM

If the TRA is to issue a third licence to a mobile network operator, it will be necessary to assign some radio frequency (spectrum) to the entrant. The TRA, in conjunction with the Ministry of Transportation, recently undertook a consultation on future spectrum policy and planning in the Kingdom of Bahrain. Following this consultation, a joint policy statement was issued by the TRA and the Ministry in June 2006²³.

This policy statement outlined a number of possible options for allocating/assigning radio spectrum to a third mobile network operator. The consultation document builds on the TRA and MoT's previous analysis (as set out in the Policy Statement) and further reviews the

²³ "Spectrum policy and planning: A joint policy issued by the Telecommunications Regulatory Authority (TRA) and the Ministry of Transportation of the Kingdom of Bahrain (MoT)", June 2006

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proposed options for a possible spectrum assignment to a third mobile network operator.

The Policy Statement sets out four options for future spectrum assignment policy. These are as follows:

- Option 1: status quo, no assignment of further spectrum for public mobile telecommunications;
- Option 2: assign 2 x 7,2 MHz of spectrum in the 400 MHz band to the new entrant;
- Option 3: assign 2 x 10 MHz of spectrum in the 850 MHz band to the new entrant; and
- Option 4: assign 2 x (25+5) MHz of spectrum in the 1800 MHz band to the new entrant.

Option 1 would only apply in the event that the TRA decides not to issue a third licence to a mobile network operator. It would not involve any further assignment of spectrum and is therefore not considered further in this consultation.

In determining the appropriate option to follow in the event that it decides to issue a third licence, the TRA will take account of a number of factors, including:

- The availability of spectrum in the particular band;
- The degree to which the proposed spectrum band and allocation offers similar amounts of spectrum to that already assigned to Batelco and MTC-Vodafone; and
- The degree to which the proposed spectrum band will promote technological neutrality in the mobile market.

Spectrum assigned to Batelco and MTC-Vodafone for mobile communications

Currently 2 x 17 MHz in the 900 MHz and 2 x 20 MHz in the 1800 MHz of GSM spectrum is assigned to Batelco, and 2 x 10 MHz plus 2 x 8 MHz in the 900 MHz band and 2 x 25 MHz in the 1800 MHz is assigned to MTC-Vodafone. In total 2 x 37 MHz of GSM spectrum is assigned to Batelco and 2 x 43 MHz of GSM spectrum to MTC-Vodafone. Figure 10 shows this division of spectrum, together with currently non-assigned available bands.

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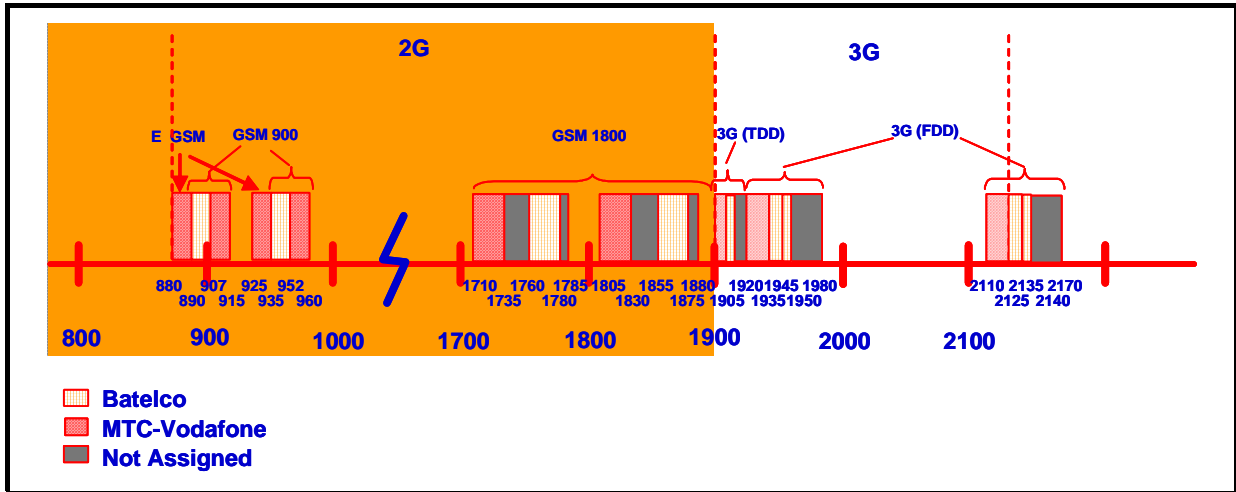


Figure 10: Public Mobile spectrum assignments in Bahrain (<1900 MHz highlighted)

Technological neutrality

The TRA proposes, as far as possible, to assign spectrum to a possible third mobile operator on a technology-neutral basis. The TRA will not prescribe a choice of technology (e.g. GSM or CDMA in the case of 2G and W-CDMA or CDMA-2000 in the case of 3G) for a third network operator to adopt. It will be up to the third operator to decide upon the preferred technology.

Option 2: 400 MHz band assignment

As shown below, the amount of spectrum potentially available in this band is limited to 2 x 7.2 MHz (450-457MHz and 460-467MHz). This is approximately the minimum amount of spectrum required for a practical network. In addition, there is only limited availability of GSM and CDMA equipment in the 400-450 MHz bands.

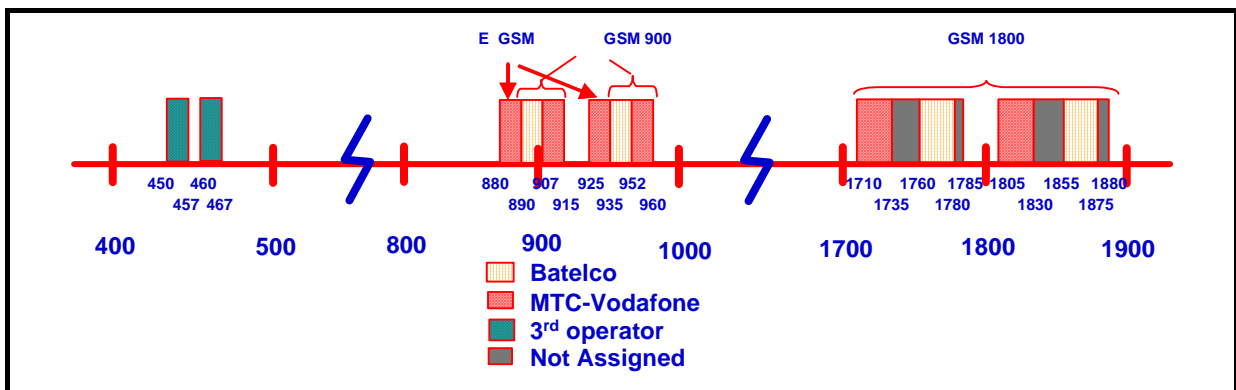


Figure 11: Options for assignment of spectrum to a third mobile licensee (Option 2 – 400MHz)

Option 3: 850 MHz band spectrum assignment

There is 2 x 10 MHz of bandwidth in the 850 MHz band which could potentially be used for either GSM or CDMA networks (824-834MHz and 869-978MHz). Both CDMA and GSM equipment is widely available in the

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850 MHz band, and therefore an assignment in this band would be conducive to the TRA’s objective of promoting technological neutrality rather than a particular network type. This option is illustrated below.

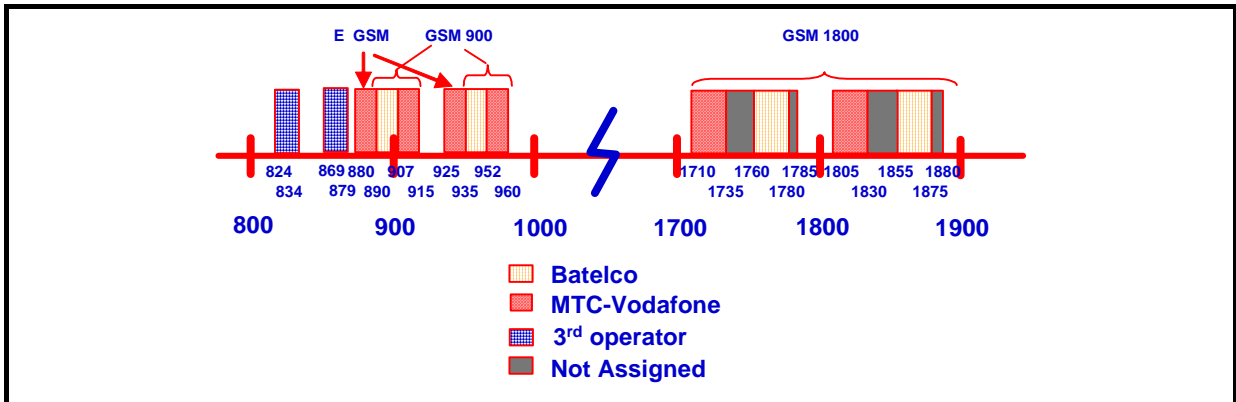


Figure 12: Options for assignment of spectrum to a third mobile licensee (Option 3 – 850MHz)

Option 4: 1800 MHz band spectrum assignment

In the 1800 MHz band there is currently one block of 2 x 25 MHz spectrum (1735-1760MHz paired with 1830-1855MHz) plus one block of 2 x 5 MHz spectrum (1780-1785MHz paired with 1875-1880MHz) that could be used for a third mobile operator. This is illustrated below.

The amount of spectrum available in the 1800 MHz band is commensurate with the level of spectrum currently assigned to Batelco and MTC-Vodafone. Whilst this spectrum could potentially be used for either GSM or CDMA networks (and hence an assignment in this band could be considered technologically neutral), the TRA notes that availability of CDMA equipment in the 1800 MHz spectrum band is currently limited.

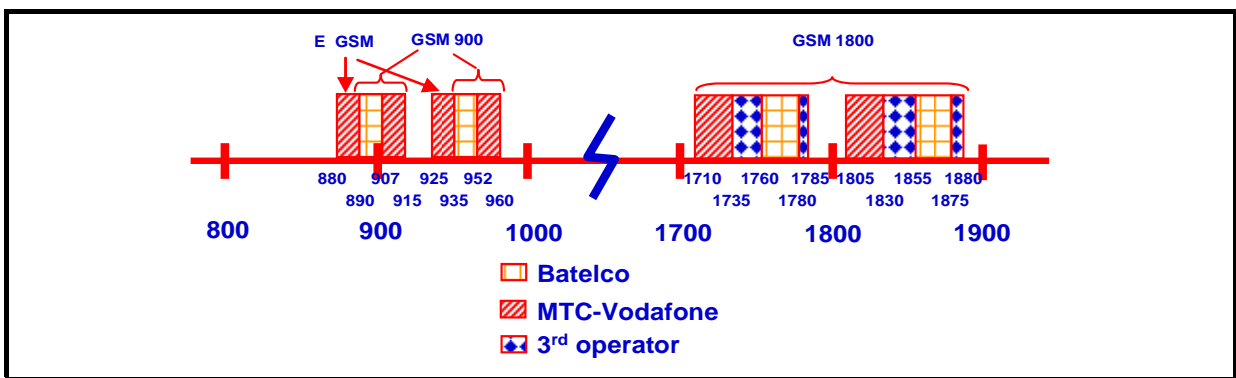


Figure 13: Options for assignment of spectrum to a third mobile licensee (Option 4 - 1800MHz)

Although CDMA equipment is not currently widely available in this band, the band offers the greatest availability of spectrum and will ensure a level playing field – in terms of amount and quality of spectrum – between the operators.

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Question 5.1:

- The TRA seeks respondents' views on the appropriateness of each of the options outlined above.

A further possible approach to a new mobile operator would be for the TRA to assign spectrum to the new operator in the 1900 MHz band. Within this band, 2 x 25 MHz blocks of spectrum (1875 – 1900 MHz paired with 1955 – 1980 MHz) plus 2 x 5 MHz blocks of spectrum (1905 – 1910 MHz paired with 1990 – 1995 MHz) could be made available to a new operator.

Both GSM equipment and CDMA equipment is available for use in this spectrum band. However, despite this and the relatively significant amounts of spectrum that can be made available in this band, a number of problems might arise if this spectrum were to be assigned to a mobile operator. In particular:

- It would prevent the assignment of 2 x 5 MHz spectrum blocks within the 1800 MHz band (1780 – 1785 MHz paired with 1875 – 1880 MHz) and also limit future assignments in the UMTS core band to one block of 2 x 20 MHz (1935 – 1955 MHz paired with 2125 – 2145 MHz) plus one block of 1 x 5 MHz in the 1910 – 1920 MHz band, thus limiting the potential for expansion of other networks.
- In order to prevent interference, a guard band between any CDMA systems used in the 1900 MHz band and W-CDMA systems in the UMTS core band (1920 – 1980 MHz / 2110 – 2170 MHz FDD band) of between 5 and 10 MHz would be required, in combination with (extra) filters in the CDMA network. The required guard band would in turn limit the future assignments in the UMTS core band further to 2 x 10 MHz; that is 10 MHz FDD spectrum (1935 – 1945 MHz paired with 2125 – 2135 MHz). In addition, two blocks of 1 x 5 MHz are available in TDD spectrum in the 1910 – 1920 MHz band.
- The FDD spectrum described above and one block of 1 x 5 MHz (1945-1950, 2135-2140) spectrum is currently reserved for Batelco in the FDD range. Assigning spectrum in the 1950-1980 MHz would mean that there would be no more FDD spectrum available in the UMTS core band. This might limit future capacity expansions of the networks of MTC-Vodafone and/or Batelco²⁴.

²⁴ The TRA considers that this need not necessarily be a problem. If more frequencies are needed in the future, these frequencies can be assigned from the additional UMTS bands in the 900, 1800 and 2500 MHz spectrum bands.

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- An assignment in the 1900 MHz band would preclude the deployment of other systems (e.g. DECT systems in the 1880 – 1900 MHz band).

Question 5.2:

- The TRA seeks respondents' views on the appropriateness of assigning spectrum in the 1900 MHz band to any further mobile operator.

3G spectrum

The TRA is of the opinion that any third operator (should one be licensed) must be able to compete on an equal footing with the two existing operators if it so chooses. In terms of spectrum availability this implies that sufficient 3G spectrum should be assigned to (or reserved for) this third operator. In the UMTS core band (1920 – 1980 MHz / 2110 – 2170 MHz FDD band) 2 x 30 MHz of FDD spectrum is available, and in the 1900 – 1920 TDD band 10 MHz is available. Of this free spectrum, 5 MHz of TDD spectrum and 2 x 15 MHz of FDD spectrum could be assigned to the third operator.

The TRA also proposes that this spectrum should be made available immediately to the new operator, if it is interested in it and should one be licensed.

Question 5.3:

- The TRA seeks respondents' views on the appropriateness of assigning 3G spectrum (as set out above) to any further mobile operator.

5.2 ENSURING ACCESS FOR MVNOS

The TRA may also (either instead of or in addition to issuing a licence to a third MNO) license MVNOs to enter the market. As described in Section 2.2.1 of this consultation, there exist a number of possible business models that an MVNO might follow, with these business models differing according to the degree to which an MVNO invests in its own network. However, regardless of which model an MVNO chooses, in order to be able to offer services, it must gain access to a host operator's network. Therefore, if the TRA is to award licences to potential MVNOs, it must ensure that the MVNOs will have the opportunity to gain access to an existing operator's network.

The TRA is aware that, in a number of jurisdictions, MVNOs and MNOs have reached commercial agreements regarding the terms, conditions and technical specifications for network access. The TRA is also mindful of the potential negative incentives for future investments by the existing MNOs of mandating access to their network at unfavourable terms for them. An approach through negotiation would therefore be encouraged by the TRA.

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However, if the TRA issues MVNO licences and it is not possible for an MVNO to reach commercial agreement with an existing MNO regarding reasonable terms and conditions for access, the TRA has the power to act in certain circumstances to ensure that access to an MNO is granted. In general this will require that the MNO in question is a Dominant operator in relevant markets.

This section of the consultation document considers whether the current regulations and licence conditions of the incumbent mobile operators are sufficient to provide a safeguard for ensuring MVNO access on reasonable terms, should commercial agreements not be possible. The current legal framework allows for MVNOs to be offered access to existing MNOs' networks in one of two possible ways.

The Law²⁵

Section 57(e) of the Law provides for licensed operators, when they are in a Dominant position in relevant markets, to offer "Access" to other licensed operators. Access is widely defined under the Law and includes making available telecommunications facilities and services, and permitting access to infrastructure and mobile networks. Access must be on fair and reasonable terms. An MVNO would be a licensed operator for the purposes of Section 57 (e) and entitled to Access from another operator in a Dominant position.

The TRA has already issued an Access Regulation²⁶. This prescribes the facilities and services that dominant operators in relevant markets should make available to other licensed operators. This regulation does not currently expressly include the provision of access services for MVNOs. However, the TRA would be entitled, under the Access Regulation, to amend the said Regulation so that it includes, *inter alia*, the telecommunications network or facilities necessary for an MVNO. Where a licensed operator is Dominant, the TRA may also, in certain circumstances, make a determination under Section 57 (e) concerning the tariffs and terms on which Access is to be provided. This is particularly so where the TRA considers that the tariffs offered by the Dominant operator are unreasonable.

If there is no MNO in a Dominant position, the TRA will be unable to make such a determination.

Section 65 of the Telecommunications Law prohibits anticompetitive behaviour, including abuse of dominance. Where one (or more) operators are dominant, then such Dominant Operator(s) could be abusing such dominant position(s) by, *inter alia*, refusal to deal and/or grant access, in certain circumstances. Accordingly, the TRA considers that the refusal by a Dominant MNO or by jointly Dominant MNOs, to grant access to an

²⁵ The contents of this consultation are not to be construed as legal advice and must not be relied upon as such. Independent legal advice should be sought regarding these issues.

²⁶ Access Regulation: Regulation 1 of 2005, April 30th, 2005.

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MVNO or other operator to, *inter alia*, its network and/or facilities, could, in certain circumstances, constitute an abuse of dominance as an anticompetitive behaviour prohibited by Section 65 of the Law (and/or by the respective provisions in the licenses). On such a finding/determination by the TRA, it would then be possible for the TRA to, *inter alia*, mandate access, which may include setting the terms and tariffs for such access.

Licence conditions of existing mobile network operators

Article 12 of the licences issued to Batelco and MTC-Vodafone to operate mobile networks supports Section 57 (e) of the Law by requiring each licensee who is Dominant to provide access to its network on the reasonable request of any licensed operator²⁷. Access is to be provided within a maximum period of time specified by the TRA and at any point or level within the network that is technically feasible and consistent with efficient delivery of telecommunications services to the consumer. The TRA may determine all tariffs for access, and the tariffs are to be cost-oriented and sufficiently unbundled so that the purchaser of access services does not pay for network components or facilities that it does not need.

Under this provision, the TRA considers that it could intervene to mandate access to the network of a Dominant operator in favour of an MVNO with some or no network assets of its own, if commercial negotiations fail.

Question 5.4:

- a) The TRA considers that (potential) MVNOs and MNOs should reach commercial agreements regarding the terms and conditions for network access. Please state, with reasons, whether you agree with the proposal.
- b) If it is not possible for MVNOs and MNOs to reach a commercial agreement, the TRA considers that the current legal framework gives it the power to intervene in disputes. Please state, with reasons, whether you agree with this, and if intervention by the TRA is required, which method(s) of intervention you consider to be most effective.

5.3 NATIONAL ROAMING

In the previous section the TRA considered the issue of network access for any MVNOs that might enter the market. In this section it considers the possible use of national roaming in connection with the entry of a third network operator. National roaming conditions have been used in a number of markets to assist the entry of new operators into the market whilst they are in the process of deploying networks.

²⁷ Note that at the date of this Consultation Document MTC-Vodafone has not been determined to be dominant in any market.

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Section 40(7) of the Telecommunications Law and Articles 19 of both Batelco's and MTC-Vodafone's licences made provision for MTC-Vodafone to have access to national roaming on Batelco's (i.e., the incumbent operator's) mobile network for a period of 12 months. In particular, MTC-Vodafone had the right to enter into a national roaming agreement with Batelco within a period of three months from the date of licence award and for the duration of one year²⁸. The TRA additionally had the power to set the terms of the roaming agreement, should the parties not have been able to reach an agreement.

Article 19 of Batelco's Mobile Licence requires that, where requested, it shall enter into an agreement with each mobile licensee for the provision of roaming services within three months of the date on which the licence is awarded. Again, should the parties fail to agree, the TRA may determine the terms of such an agreement. The agreement shall be valid for a period of one year or such longer period as the TRA determines, based upon any actions or omissions by the licensee which delay the prompt build out of the network of the MNO that requires access to national roaming.

In contrast, Article 19 of MTC-Vodafone's Mobile Licence contains no such obligation. It simply mandates MTC-Vodafone to enter into a domestic roaming agreement with Batelco.

The TRA is aware that potential mobile operators might wish to make use of national roaming so as to be able to offer nationwide services from the date of service launch.

In determining how national roaming should be offered to a potential entrant, it is necessary to consider a number of factors, including:

- the obligation to provide national roaming applies only to Batelco;
- the degree to which the TRA should intervene in determining the terms of any roaming agreement;
- the degree to which technological neutrality might affect the ability of network operators to offer national roaming; and
- the length of time for which national roaming obligations should apply and for which the new entrant can make use of a national roaming service.

Question 5.5:

- The TRA seeks the views of respondents on the importance of national roaming and the extent to which it should influence the determination of the terms of any roaming agreement.

²⁸ This could be extended in the event that the TRA determined that MTC-Vodafone's network build-out had been delayed due to the actions of the incumbent.

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5.4 THE INTRODUCTION OF MOBILE NUMBER PORTABILITY

Mobile number portability (MNP) refers to a system whereby customers are able to switch between mobile providers without changing their phone numbers. Without MNP, a customer must take a new number whenever switching to an alternative network. MNP is considered to reduce the costs of switching between mobile operators – with MNP customers will be able to change providers without incurring the cost and inconvenience of taking a new number.

The TRA has previously set out its position on the introduction of MNP²⁹. It believes that the introduction of MNP is likely to enhance competition in the mobile market due to the reduction in switching costs that is likely to arise from its introduction. As switching costs fall, customers may be more likely to switch between providers, thus enhancing the degree of competition between the providers.

Competition between mobile providers in Bahrain is increasingly likely to focus on competition for existing customers rather than competition to attract previously unserved customers. This is likely to increase the potential importance of MNP in the market.

The introduction of MNP is, however, a significant issue in itself. The TRA would therefore propose to conduct a separate consultation on MNP prior to taking any decision to introduce it.

Question 5.6:

- The TRA seeks the views of stakeholders with regard to MNP in Bahrain and the extent to which the entry of additional mobile providers might be influenced by the introduction of MNP.

5.5 HOW SHOULD ANY NEW LICENCE BE ISSUED?

If the TRA decides to issue a licence to a third mobile network operator, it is necessary to determine an approach for assigning the licence. There are two basic ways of offering licences: auctions and comparative selection processes (“beauty contests”). As stated in the Spectrum Policy Statement, the award process for such an additional licence shall be a matter for consultation. The TRA therefore invites comments on both the possible approaches, as outlined below.

- **Auctions** aim to recover some of the rents attached to the licence, and to assign the licence to the bidder who will make most efficient use of the licence. Auctions can be carried out in a number of forms, the

²⁹ “Mobile number portability: A position paper issued by the TRA”, September 2003

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most common being single-round “sealed bid” auctions and multi-round ascending auctions.

Sealed bid auctions are simple to administer and to participate in, and so are particularly appropriate for smaller markets. However, they do not have the advantage of the information-sharing that takes place in multi-round auctions.

Under Section 29 (c) of the Law, the TRA is obliged, in the case of any individual licence, to ensure that any applicant has sufficient resources, skills and expertise to offer the services in question. It must also ensure that the interests of subscribers will be served by issuing the licence. An auction alone may not allow the TRA to satisfy these criteria. It may therefore be necessary to conduct a pre-qualification phase prior to the auction.

- In **beauty contests**, bids are assessed against a number of criteria. Some of these criteria may be related to meeting social or universal service objectives such as the level of tariffs or coverage and rate of roll-out, or may be other indirectly related criteria such as employment creation or the level of investment. Beauty contests may also use licence fees as one of the criteria. The criteria used need to be measured and weighted together to form a single score, which can be compared across the bidders. Beauty contests can thus be considered as “multi-factor” auctions.

The TRA issued the second (mobile operator) licence to MTC-Vodafone through a beauty contest process. This process comprised seven evaluation criteria, namely:

- Identity of the applicant (i.e., shareholders, beneficiaries and management);
- Ability to compete in the market (i.e., related to the experience of the bidder);
- The economic benefits the bidder may bring to the Kingdom;
- The financial strength of the bidder;
- The level of commitments made by the bidder;
- The bidder’s business plan; and
- The extent of network coverage and speed of roll-out.

The TRA is however currently minded to use an auction mechanism – following pre-qualification of bidders – to award an operator licence to a third MNO. The TRA considers that auctions have several advantages over other allocation methods. Auctions are widely perceived to be transparent, open, and fair, whilst they are also considered to be the most economically efficient means of allocating scarce resources, since they ensure that the scarce resource is directed to those who value it most highly. Auctions can be criticized for taking account of price considerations and not other factors in the proposed business plans of bidders. The TRA would therefore propose to require prospective bidders

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to pre-qualify for the auction, with pre-qualification taking account of factors such as the financial standing of the bidder, the proposed network roll-out and the identity of the applicant.

Question 5.7:

- The TRA seeks the views of respondents regarding the appropriate licence selection method for issuing a licence to any further mobile network operator.

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6 Glossary

In Table 3 we provide a glossary of terms and abbreviations commonly used in this report.

MNO	Mobile network operator
MVNO	Mobile virtual network operator
TRA	Telecommunications Regulatory Authority of Bahrain
HLR	Home Location Register
IN	Intelligent Network
Mobile penetration	A measure used to estimate the proportion of the population who are mobile telephony customers. Calculated as the number of mobile customers divided by total population. A penetration of more than 100% indicates that some customers will have more than one SIM card.
Grade of service	A measure of the proportion of calls that are lost due to congestion in the busy hour of the day.
Call dropping rate	Call drop-out is a measure of the ability of a mobile network to maintain a call until it is terminated by the customer. The call dropping rate is measured as the amount of call drop-outs as a percentage of total calls.
Call blocking rate	The call blocking rate is a measure of the ability to establish a call.
EDGE	Enhanced Data rates for GSM Evolution. Acts as an enhancement to GSM networks to increase data capacity.
3G	Third generation. 3G networks provide the opportunity to transfer both voice and data services, with data being transferred at a faster bit rate than with second-generation networks. 3G networks allow the delivery of new services, such as video calling.
GSM	Global Standard for Mobile. A second-generation mobile standard.
CDMA	Code Division Multiple Access. An alternative mobile telephony standard to GSM.
W-CDMA	Wideband Code Division Multiple Access. "Third-generation" network technology behind the UMTS standard (see below).
CDMA-2000	An alternative third-generation standard, based on the CDMA standard.
UMTS	Universal Mobile Telecommunications System. A third-generation mobile technology.
FDD spectrum	Frequency Division Duplex. A duplexing scheme used in fixed broadband wireless networks.

Table 3: Glossary

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7 Summary of Consultation questions

2. The analytical framework

Question 2.1:

- Please set out whether you agree with the proposed analytical framework of the TRA and in particular the nature of the likely trade-offs outlined by the TRA in this Section of the consultation.

3. Current state of the mobile market in Bahrain

Question 3.1:

- To what extent do respondents consider that the usage baskets and comparators employed by the TRA in this analysis are appropriate?
- Should the TRA consider further analysis of comparative price data, and if so, what should this analysis cover and why?

Question 3.2:

- To what extent do respondents consider that there currently exists a significant degree of price competition in the provision of mobile services in Bahrain?

Question 3.3:

- To what extent do respondents consider that the mobile operators are currently providing a reasonable level of (network) quality of service?
- To what extent do respondents consider that the mobile operators are currently providing a reasonable level of customer service?

Question 3.4:

- To what extent do respondents consider that mobile operators in Bahrain offer similar ranges of services to those offered by mobile operators in other jurisdictions?

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Question 3.5:

- Are there any other factors the TRA should consider in its review of the current state of the mobile telecommunications market in Bahrain?

4. The possible impact of further entry into the market

Question 4.1:

- To what extent do respondents consider that there is scope for further price reductions in Bahrain's mobile market?
- To what extent do respondents consider that prices for mobile services in Bahrain currently reflect efficient economic costs of providing those services?
- How should the TRA assess the profitability of the existing mobile operators in Bahrain?
- Do respondents consider that there are other factors the TRA should take into account in its analysis of prices and profits?

Question 4.2:

- To what extent do respondents consider that the potential impact on mobile prices from MNO and MVNO entry may differ?

Question 4.3:

- Do respondents consider that further MNO entry into the Kingdom's mobile sector might lead to an increase in the quality of mobile services offered in Bahrain?

Question 4.4:

- To what extent do respondents consider that the entry of MVNOs might impact on the quality of mobile services offered in the Kingdom?

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Question 4.5:

- Do respondents consider that further MNO entry into the Kingdom's mobile sector might lead to an increase in the range of products, tariffs and services on offer?

Question 4.6:

- To what extent do respondents consider that the entry of MVNOs might impact on the range of mobile products and services offered in the Kingdom?

Question 4.7:

- Do respondents consider that further entry into the Kingdom's mobile sector might lead to a significant change in the average unit costs of existing operators? (Evidence should be provided to substantiate the argument in either case.) Do respondents agree with the TRA about how this effect would be expected to differ between MNO and MVNO entry?

Question 4.8:

- a) Are there any other factors the TRA should consider in assessing the potential attractiveness of the market to new investors?
- b) What are the views of respondents regarding the relative merits of MNO and MVNO entry?
- c) Should the TRA consider a period of 'exclusivity' for any further MNO licensee, similar to the one that applied when the second mobile licence was granted? Should the TRA consider any other measures to facilitate entry?

Question 4.9:

- Are there any other potential benefits that the TRA has not included in its discussion set out above?

Question 4.10:

- To what extent do respondents agree with the TRA's initial analysis, as outlined in Section 4 of the consultation?

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5. Other issues to be considered

Question 5.1:

- The TRA seeks respondents' views on the appropriateness of each of options outlined above.

Question 5.2:

- The TRA seeks respondents' views on the appropriateness of assigning spectrum in the 1900 MHz band to any further mobile operator.

Question 5.3:

- The TRA seeks respondents' views on the appropriateness of assigning 3G spectrum (as set out in Section 5) to any further mobile operator.

Question 5.4:

- a) The TRA considers that (potential) MVNOs and MNOs should reach commercial agreements regarding the terms and conditions for network access. Please state, with reasons, whether you agree with the proposal.
- b) If it is not possible for MVNOs and MNOs to reach a commercial agreement, the TRA considers that the current legal framework gives it the power to intervene in disputes. Please state, with reasons, whether you agree with this, and if intervention by the TRA is required, which method(s) of intervention you consider to be most effective.

Question 5.5:

- The TRA seeks the views of respondents on the importance of national roaming and the extent to which it should influence the determination of the terms of any roaming agreement.

CONSULTATION

Issuing additional mobile licences

Question 5.6:

- The TRA seeks the views of stakeholders with regard to MNP in Bahrain and the extent to which the entry of additional mobile providers might be influenced by the introduction of MNP.

Question 5.7:

- The TRA seeks the views of respondents regarding the appropriate licence selection method for issuing a licence to any further mobile network operator.