ICT Regulation Toolkit

2.6 Mobile and Wireless Network Regulation

Mobiles have been a spectacularly successful communications technology in both developed and developing countries. Most markets can support mobile competition. Also, mobile is the best way to extend telephone service in developing countries because mobile infrastructure is cheaper to deploy than fixed networks. Compared with the fixed network, regulation of mobile competition and pricing is light because competition makes regulation less necessary.

In developing countries, the fixed network is relatively immature with mobiles being the platform of choice for cheap deployment. According to ITU data, as at the end of 2009, over 65 per cent of countries worldwide have full or partial competition in basic services (local, long distance and international services) and 90 per cent of countries have either partial or full competition in the mobile sector.

Wireless networks share many of the same competition and pricing issues as the fixed network and examples of mobiles have been used in previous sections. In this section, we focus on issues which are specific to wireless and mobile networks [*] Some might distinguish between fixed wireless and mobile platforms. The former include 'fixed mobile' services and WiMAX. For convenience, we shall refer to mobiles because the regulatory issues are largely the same. Also, the idea of what constitutes a mobile phone is changing fast. How should we count e-readers, tablets, wireless broadband dongles and machine-to-machine communications which all depend upon wireless connectivity?. **Where specific issues are covered in depth in other Modules** [*] For example, specific issues covered in other modules include **spectrum**, **licensing** and **Universal Service**., we shall touch only on how they affect competition and pricing.

In this section we shall explore:

- **Policy Issues**
- **Key Concepts**
- **Spectrum Policy**
- **Interconnection**
- **Roaming**
- **Infrastructure Sharing**
- **Enhancing Competition**

The important guiding principle emerging from these topics is that regulation should neither dictate users' preferences nor interfere with the flood of innovation flowing through mobiles.

An extreme example of light-handed regulation is Somalia. Since January 1991, most of Somalia has had neither security nor stability. Yet, the business success story of the last 20 years has been the growth of the mobile telecommunications sector. There are nine networks to choose from and they offer services from texting to mobile internet access.

There is no need to get a licence and there is no state-run monopoly to prevent new competitors being established. And of course there is no-one to demand any taxes, which is one reason why prices are so low.

Despite the absence of law and order, bills are paid and contracts are enforced by relying on Somalia's traditional clan system. The warlords realise that if they cause trouble for the phone companies, the phones will stop working again, which nobody wants.

◄ **Box 6.1: Somalia**
Source: BBC, 26 January 2011
http://www.bbc.co.uk/news/world-africa-12278628

2.6.1 POLICY ISSUES

There are a number of policy issues with aspects specific to mobiles [*]:

- **Spectrum Policy (6.3)**

- **Interconnection (6.4)**
- **Roaming (6.5)**
- **Infrastructure Sharing (6.6)**
- **Enhancing Competition (6.7)**

Mobile and other wireless services are becoming effective substitutes for fixed telecommunications services for some users. Indeed, in many developing countries, wireless minutes of use exceed fixed minutes of use. This trend brings into question the long held assumption that an incumbent telecommunications operator will necessarily be the dominant operator in the market.

An open question is whether the success of mobiles will hinder the development of fixed broadband services. There has been call substitution from fixed to mobiles for some years and now there is mounting evidence of line substitution too (Box 6.2). It probably does not matter if fixed services are available to businesses in cities and residential customers find mobile broadband adequate [*].

Kenya was a slow starter with only 114,000 subscribers seven years after mobile was first introduced. It was thought to be too expensive for the mass market. But following market reform and liberalisation the mobile market penetration took-off. Also, mobile broadband has emerged as the dominant form of broadband access accounting for 99 per cent of internet subscriptions.

◀ **Box 6.2: Mobiles Dominate Voice and Broadband: Kenya**
Sources: **http://www.itu.int/ITU-D/icteye/** and **http://www.cck.go.ke/**

As with the fixed network, **digitisation** is presenting mobile operators with the same challenge to traditional business models. In the case of mobiles, both voice and text messaging revenues can be diluted by **apps**. Since digitisation has separated access and services, in emerging business models access must 'pay its own way' and cannot rely on cross-subsidies from services. Of course, this may make affordable universal access harder to achieve and presents a policy challenge.

The digitisation of mobile networks puts capacity pressures on both mobile 'access networks' (spectrum) and 'backhaul' (transmission networks). The availability of spectrum is considered in **Section 6.3.** For backhaul, mobile networks have relied on microwave to connect base stations but with increasing volumes as traffic moves from voice to data, transmission will have to be carried by fibre.

Policy makers have been generally sympathetic to infrastructure sharing where mobile operators seek to share the extra sites required to migrate to new technologies and accommodate increased traffic.

Unbundling of the kind seen on fixed networks has not generally been applied to mobile networks. Mobile operators have not been obliged to accommodate call competition with carrier or call selection [*] and the nearest equivalent to unbundled local loop and bitstream access, which is the **MVNO (6.6)**, is not usually mandated.

2.6.2 KEY CONCEPTS

A key difference between fixed and mobile networks is the technology used in the customer access network. The fixed network uses copper or fibre (or both) to provide wired connections. Mobiles use radio spectrum to connect the end-user; mobiles are 'wireless access lines'.

- **Spectrum (6.3)** is made available across different frequency bands for many different purposes. Lower frequency bands are suitable for mobile coverage and higher frequency is used to support capacity (eg video).
- **2G, 3G and 4G** are successive 'generations' of mobile technology. 2G is voice and 3G is a combination of voice and data and 4G is designed expressly for (IP) data (see **Telstra's path to 4G**). (1.5.2)
- **Interconnection (6.4)** is similar to the fixed network except where RPNP applies.
- **RPNP** (Receiving Party Network Pays) is less common than CPNP (Calling Party Network Pays) and does not apply in fixed networks.
- **BAK (6.4)** or 'bill and keep' is associated with RPNP and is similar to **peering** (3.1.2) in the internet.
- **SIM (6.7)** (Subscriber Identity Module) card is used in all GSM mobiles. Multiple SIM cards allow the same phone to be used on different networks.
- **MVNO** (Mobile Virtual Network Operator) is a form of **infrastructure sharing (6.6)** used by entrants without spectrum and using varying amounts of other capacity.

2.6.3 SPECTRUM POLICY

In developed countries, access to spectrum for mobiles is more of an issue than for developing countries where making spectrum available in developing countries may be less costly and is typically is used less intensively.

A key issue for wireless due to the growth in mobile data traffic is access to more spectrum. **Radio Spectrum Management** is covered in another Module. Here, we focus on competition and pricing. The choice of spectrum is important because it affects the cost of equipment (and hence the price of services), coverage (universal service objectives) and inter-operability.

In the US and Europe a major source is the spectrum released in the migration from analogue to digital television; the **digital dividend.** More recently, there has also been interest in making more effective use of broadcast television spectrum with the US being the first country to allow the unlicensed use of **white spaces.**

Mobile's need for spectrum is a direct result of the growth in data services; in particular, video which takes up a lot of bandwidth.

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Australia has tried restricting access to spectrum to encourage market entry. The Government gave itself this ('competition limits') power in 1997 when Australia already had three established mobile operators (Telstra, Optus and Vodafone).

Although two entrants did emerge, they did not survive: OneTel went into receivership and Hutchison has merged with Vodafone.

The Productivity Commission, which reports to the Treasury, recommended that the power to exclude operators from spectrum auctions should be removed as '*unnecessary, potentially distortionary and procedurally deficient'.* However, the recommendation was rejected by the Government in December 2002.

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◀ **Box 6.3: Australian spectrum restrictions**
Source: Productivity Commission, Radio Communications Inquiry Report, 2002

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The price of spectrum can also have a bearing on competition because some auctions have crippled operators who paid too much for spectrum. In developing countries, there may be more public benefits in seeing spectrum used well than getting high prices for spectrum; which leads to other methods of allocating spectrum (e.g. 'beauty contests' where applicants explain how they would use any allotment of spectrum).

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The regulator in Morocco ran a 'beauty contest' in 2006 awarding three 3G licenses. The results were astounding – mobile broadband subscriptions increased 530 per cent between 2007and 2008.

Bidders included Maroc Telecom, Méditel, WANA (Maroc Connect at the time) and Maroc Nejma (a Kuwait-based company). The evaluation was based on four criteria: 1) deployment of infrastructure, 2) service quality engagement, 3) diversity, innovation, and incentive packages to customers, and 4) financial viability of bidder and shareholder relations.

The aspiring new entrant WANA made a great impression and was ranked first, followed by Maroc Telecom and Méditel. WANA's launch of its restricted mobility service (branded as Bayn) in 2007 and full mobility service (branded Wana Mobility) in 2008 expanded mobile broadband as well as its own public reach and penetration.

When the company launched WANA mobility using CDMA technology (not the GSM standard that Méditel and Maroc Telecom used), they gave away free phones (two for the price of one). The promotion was so popular that WANA sales exceeded expectations and the company faced two major challenges: 1) a still under-developed infrastructure that could not handle the burden of so many users at once, and 2) technology incompatibility resulting in unexpected roaming issues (most neighbouring countries were using GSM). Eventually, many of the customers switched back to Maroc Telecom and Méditel.

Since 2010, WANA has been recapitalized by the Zain Group, changed management, and adopted a new brand name; INWI which claims the greatest 3G coverage, providing CDMA2000/EVDO for all new customers and 1X (an IMT-2000 technology but slower) where coverage areas have not yet been enhanced with EVDO technology.

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◀ **Box 6.4: Awarding 3G licences in Morocco**
Source: Broadband in Morocco: Political Will Meets Socio-Economic Reality, info/DEV October 2011

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Practice Notes

- **Digital Dividend Spectrum**
- **White Spaces Spectrum [1]**

Reference Documents

- **Australian Productivity Commission, Radio Communications Inquiry Report, 2002**
- **Broadband in Morocco: Political Will Meets Socio-Economic Reality, info/DEV October 2011**

- European Commission: Spectrum and radio access networks: the T-Mobile/Orange joint venture in the UK, 2010

- GSR 2012 International Mobile Roaming Services: A Review of Best Practice Policies. Discussion Paper, ITU.

- GSR 2012 Spectrum Policy in a Hyperconnected Digital Mobile World. Discussion Paper, ITU.

2.6.4 INTERCONNECTION

The interconnection issues associated with mobiles depend on which of two charging regimes apply. Most countries use Calling Party Network Pays (CPNP) but a few countries (e.g USA and Canada) apply Receiving Party Network Pays (RPNP) which allows for bill and keep (BAK) payment systems where there are no inter-operator payments (end users at each of the call may pay a fee to their respective operators) [*].

IP interconnection will eventually replace switched interconnection as new mobile technologies are data-centric and data traffic is becoming more significant than voice traffic. The transition will be harder for operators in CPNP countries if voice interconnection rates are high because IP interconnection is very cheap.

There is no access pricing issue with RPNP because there are no wholesale termination charges. The end-user placing the call pays the operator providing the mobile phone without the operator completing the call receiving any payments (BAK).

BAK is now finding favour as a possible wholesale charging arrangement in both fixed and mobile next generation networks for IP interconnection (see sections 3.1.2 and 4.3) because it is similar to 'peering' on the internet. This regime also reduces the amount of interconnection issues that a regulator has to deal with.

The Australian regulator asked the industry if would consider moving to BAK [*]. But the majority of stakeholders preferred a uniform approach to regulating MTM and FTM termination. One concern was the risk of arbitrage which arises if traffic originating on a fixed network is presented by an access seeker as mobile-originated traffic. Such traffic would be terminated at zero price under a BAK system while fixed-originated traffic would normally be charged at the FTM termination rate. There are potentially significant costs associated with monitoring arbitrage activities and rectifying their consequences.

For CPNP countries the cost of terminating traffic on mobile networks continues to be a key regulatory issue. Both main forms of mobile termination under CPNP may be regulated:

- Fixed to Mobile call termination (F2M)

- Mobile to Mobile network call termination (M2M)

Calls to the fixed network (M2F) are usually terminated at the same rates as fixed (F2F) calls.

A special case of M2M is machine-to-machine communication [*] which is rated more cheaply than person-to-person M2M calling and is not currently regulated; perhaps because machine-to-machine communications tend to be on-net services offered by an individual operator to an individual business.

The wholesale termination rate is usually the same for both F2M and M2M; which also has to deal with text messages (SMS, short message service) and MMS (picture and video transfer).

CPNP is generally believed to cause a market failure problem requiring regulation of mobile call interconnection. With CPNP, charges are ultimately borne by the customers of the originating operator and there is no competitive pressure on the terminating operator to constrain its wholesale charges [*]. Price controls imposed on wholesale mobile termination have been justified on the basis that a high mobile termination rate:

-
    - is due to each mobile network operator having monopoly power over the termination of calls on its network

    - leads to high retail prices, as the termination fee generally sets a floor on the retail price which discourage calling ;

    - makes it harder for a much smaller mobile competitor to expand because of the additional cost that is linked to off-net calls;

    - makes it harder for smaller mobile competitors to grow because larger networks have more extensive off-net calling opportunities to offer customers.

Where there is a large fixed network, mobile operators have used high F2M termination rates to promote mobile adoption through cheap SIM cards and handset subsidies. However, in many developing countries the fixed network is often not large so the fixed network cannot provide cross subsidies to mobile users (and is not recommended anyway).

In the Mobile to Mobile (M2M) context, mobile networks typically price on-net calls lower than (off-net) calls to other networks. If M2M termination rates are high, larger mobile networks are more likely to attract customers in a sort of 'club effect': to get cheaper calls, customers select the mobile operator that the people they call most also use. Without regulation, an operator could increase its termination rate to generate more revenue without affecting its own customers. The new revenue could be used to offer deeper on-

net discounts to attract more customers which then generate more incoming calls and more revenue for bigger on-net discounts and so on.

MTC is the largest of the three mobile operators with about 85 per cent of the mobile market. It has tried to use its dominance to maintain its position it two ways; which have both been remedied by regulatory intervention.

MTC used high M2M termination charges to offer low on-net call charges to its customers. In 2008, the M2M rate was N$1.06 and MTC charged its customers N$2.5 for off-net calls compared with N$1.79 charged by its nearest rival (CellOne, rebranded later as Leo). Since most customers were already on MTC, this created a 'club effect'. Keeping its retail prices high caused traffic imbalances with the other network operators (both fixed and mobile) making net interconnection payments to MTC.

Following complaints and a benchmarking exercise, in July 2009 the regulator forced the M2M rate down to N$0.60 immediately (equal to the fixed termination rate) and required it to fall to N$0.30 (about 4 US cents) by the beginning of 2011. This removed the justification for the different retail prices between on-net and off-net calls.

But MTC did not pass through falls in M2M wholesale charges to the retail prices its customers paid to call off-net customers. Unless customers can move easily to other mobile networks, the 'club effect' continues because the difference in on-net and off-net retail charges is maintained. So in February 2011 the regulator prohibited different retail prices for these two types of calls.

Despite dire warnings from MTC about the impact of these changes on its profitability and ability to invest, MTC has continued to prosper.

There is little cost justification for high mobile termination rates. Reducing mobile termination rates to cost leads to more traffic between networks increasing consumer welfare.

In Kenya, the regulator reduced the mobile termination rate from KES 4.42 per minute to KES 2.21 in August 2010 and this combined with increased mobile competition led to 70 per cent increase in calls to other mobile networks over 3 months compared with a 3 per cent increase in on-net call traffic.
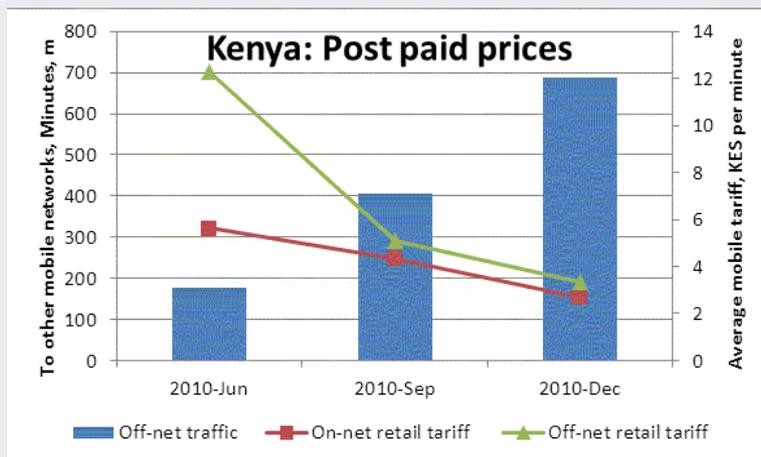
Kenya does not have a large fixed network; and what it has is losing customers. At December 2010, there were just under 0.4 million fixed lines (of which, over half were fixed wireless) and 25 million mobile subscribers.

In 2008 mobile termination rates in Europe ranged from 2 eurocents per minute in Cyprus to 8 eurocents in Germany, over 10 eurocents per minute in Greece and almost 16 eurocents in Bulgaria. This fragmented price regulation was seen as a serious risk to creating a single borderless market for telecoms services in Europe and a real threat to Europe's competitiveness. As a result of an agreement in May 2009 on regulatory treatment of termination rates, they are required to fall to 'pure' [*] **LRIC.** This is expected to result in rates between 1.5 and 3 eurocents by the end of 2012 [*].

Figure 6.1: European M2M wholesale price trends

€ per minute

Belgium — Bulgaria — Cyprus — France — Germany — Italy — Portugal — Spain — UK

Source: Ofcom, *Mobile Termination Review Statement*, March 2011
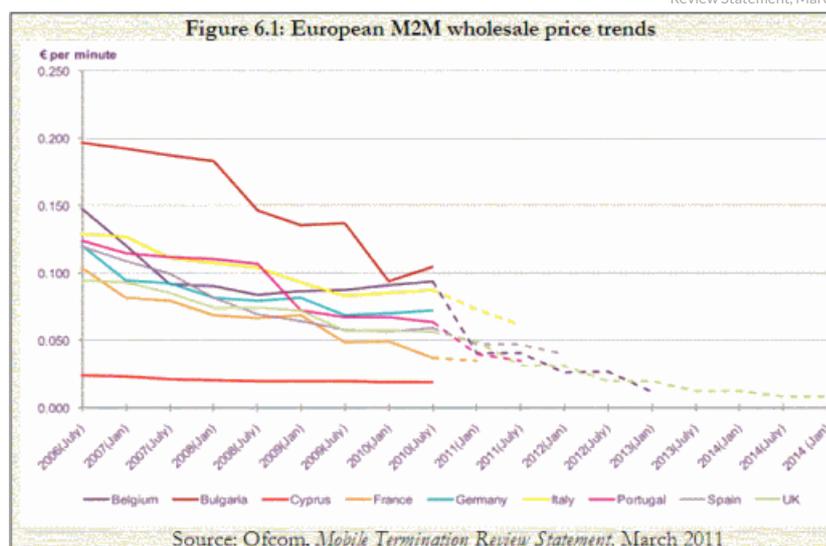
Practice Notes

- **Two-Sided Markets**

Reference Documents

- **ACCC Inquiry to make a final access determination for the Domestic Mobile Terminating Access Service (MTAS), 7 December 2011**
- **Namibia: Interconnection Benchmarking Study, Final Public Report**
- **Namibian Telecommunication Sector Performance Review, 2010**
- **Ofcom, Mobile Call Termination Statement, March 27, 2007**
- **Ofcom, Mobile Termination Review Statement, March 15 2011**
- **South Africa- The case for the regulation of call termination in South Africa: an Economic Evaluation.**

2.6.5 ROAMING

Roaming can be domestic or international. Operators normally pay a wholesale roaming charge (usually a charge per minute of use) in order to let their customers make or receive calls on another mobile network. Operators pass these roaming charges along to their customers with a mark-up.

In the case of domestic roaming, a new entrant will seek arrangements with other operators to extend coverage to its customers into areas where it has no network. Since coverage can be an important differentiator between mobile networks, this is an arrangement that may not appeal to larger mobile networks [*].

National roaming is generally simpler and less costly to manage than active infrastructure sharing. But national roaming may lead to a greater degree of uniformity among operators' retail offerings. The roaming operator must rely on the choices made by the 'visited' operator running the network in that area. In addition, price competition may be restricted, since the retail tariffs charged by the roaming operator will be based, to a large extent, on the wholesale charges paid to the visited operator.

In 2002, T-Mobile and O2 notified the European Commission (EC) that they wished to allow roaming between their respective 3G networks in Germany. The EC argued that national roaming restricted competition because of its effect on coverage, roll-out, prices, and quality of service, especially in urban areas where there were good opportunities for the roll-out of competitive networks.

O2 challenged this decision before the European Court of First Instance (Court), claiming that there was no restriction of competition, and that the EC analysis of the effect of the agreement on competition was flawed.

In 2006, the Court agreed that the EC had not properly assessed the extent to which the agreement was necessary for O2 to enter the market. It found that the EC analysis had no objective discussion of what the competition situation would have been in the absence of the agreement, which distorted the assessment of the actual and potential effects of the agreement on competition. Also, the EC's claim that national roaming restricts competition was based on general statements about roaming agreements, not on concrete evidence specific to the agreement for that market. The EC also failed to demonstrate that any price dependence between the parties limited the freedom of O2 to set its prices on the market.The Court considered that such a roaming agreement, rather than restricting competition between network operators, may actually increase competition by letting a small network operator (in this case O2) compete with a large one (in this case T-Mobile).

Despite the concern about greater uniformity among operators' retail offerings, roaming may be the only alternative to bring coverage to a certain area. Roaming can make services more available and more affordable in many areas.

France provides an example of using roaming to extend mobile coverage throughout a country, including its rural regions. In 2006 the French government launched a programme called 'programme zone blanche' ('dead zone programme') aimed at providing mobile coverage in rural zones where operators had no coverage. The intention was to provide mobile coverage to 99 per cent of the French population by the end of 2007, covering more than 3,000 rural communities in France. Coverage in these areas may be achieved either through site sharing or through roaming. ARCEP's 2010 Annual Report says 2G mobile coverage now stands at 99.9% of the population, which means there are virtually no more dead zones and fewer and fewer 'grey areas' where only a single operator is present.

International roaming is a monopoly like **mobile terminating access (section 6.4)** but is more complicated because of the international dimension: national regulators generally have little or no control over bi-lateral agreements between mobile operators in different countries. Because these terminating rates are harder to regulate down, multi-country operators have an opportunity to generate 'club effects'. For example, in 2006 Celtel (Zain) introduced 'borderless roaming' across its customers in Kenya, Tanzania and Uganda so they did not have to pay roaming charges to make or receive calls and they had the ability to top up their calling credit in any country.

International roaming is an important issue for the European Community which is creating a borderless market. It wants to create a stand-alone market for **international roaming (section 6.5)** with wholesale terminating prices regulated to the average of mobile terminating rates across the EU. Mobile customers would then have the right to opt for independent roaming services without having to change their number. From July 2012, the prices of voice, SMS and data have been capped at the retail and wholesale level [*].

Practice Notes

- **Mobile International Roaming among Arab Countries**
- **National Roaming**

Reference Documents

- **ARCEP, Annual Report 2010**
- **BEREC - Analysis of the European Commission's Proposal for a Regulation on Roaming, August 2011**
- **European Commission, Regulation of the European Parliament and of the Council on roaming on public mobile communications networks within the Union, COM(2011) 402 final**
- **O2 (Germany) v. Commission**

2.6.6 INFRASTRUCTURE SHARING

There are some benefits that apply to almost all forms of mobile network sharing [*]. Network-sharing agreements generally benefit operators and the general public from a cost perspective. Network sharing helps operators to attain more efficient coverage, since operators may choose to use only those sites that provide deeper and better coverage, decommissioning sites with poor coverage possibilities. Operators can then reinvest those savings in upgrading their networks and providing better coverage and services to end users.

Passive infrastructure [*] sharing is usually encouraged. Wireless communication masts and antennas can be unsightly and local communities may object to the construction of new sites because of the visual impact or because of the fear of public exposure to electromagnetic fields around masts and antennas. Site sharing can limit such concerns [*] and potential negative effects. Another beneficial aspect of site sharing is the amount of energy that can be saved when operators share electrical power, which is often in limited supply in developing countries.

Site sharing can also speed up network deployment and make it less expensive. In the European Union, for example, 2G networks were deployed in the 900 megahertz (MHz) spectrum band, while 3G licenses were assigned in the 1900-2100 MHz band. Because spectrum generally has a shorter range at higher frequencies, 3G networks require more base stations (and therefore more sites) – a significant transition expense for 2G operators. However, if those 2G operators can co-locate 3G equipment on each other's existing 2G towers, they can enjoy significant savings as a result.

Active mobile infrastructure [*] sharing may not be permitted under the licensing regimes of some countries. This is the case in India, for example, where the licensing regime for mobile telecommunications does not permit active sharing. Other regulatory agencies may allow active sharing only with strict conditions, in the belief that competing operators should utilize their own infrastructure independently.

"Network sharing could also have undesirable consequences for competition. For example, [mobile network operators] could collaborate on network development and gain information about each other's costs and plans, which may have a chilling effect on competition in the retail market. Dynamic efficiency may also be lower with fewer networks able to provide high quality mobile broadband services. End-to-end competition, i.e. at both the network and service level, could lead to greater innovation, which could bring significant benefits for consumers. We note that the competition concerns would be amplified if the 900 MHz operators were themselves to decide to share a single UMTS 900 network in response to the actions of their competitors. While it is difficult to quantify the potential impact of these effects, Ofcom's initial view is that there is a significant risk that both competitive intensity and innovation in mobile broadband services would be weakened, with potentially serious impacts on consumer welfare."

With the merger of **Orange and T-Mobile** (Box 2.10) as Everything Everywhere, the number of national mobile operators dropped from 5 to 4 (the others are Telefónica, Vodafone and H3G). To ensure that this number does not drop any further, Ofcom is proposing to structure spectrum auctions to guarantee 4 competing national networks.

Ofcom's second consultation on assessment of future mobile competition and proposals for the award of 800 MHz and 2.6 GHz spectrum and related issues, 12 January 2012

◄ **Box 6.9: Ofcom's concerns with infrastructure sharing**
Sources: Ofcom, Application of spectrum liberalization and trading to the mobile sector, 20 September, 2007 and

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Generally speaking, network sharing is a useful tool for regulators and policy makers who want to encourage network deployment in unserved or under-served areas. Several instruments can be used to promote network sharing. National roaming arrangements are probably the most simple and effective arrangements. While roaming leads to a certain level of uniformity among operators' offerings, this does not necessarily restrict competition significantly. National regulatory authorities that have anti-competitive concerns may allow network sharing for a limited period (for example, one or two years) in order to promote roll-out of initial phases of network deployment. After that, operators could be required to provide coverage using their own networks.

A more complex form of sharing is the mobile virtual network operator (MVNO). The types of MVNO range from resale to bulk buying:

- The resale end of the market buys the existing suite of products and services off the provider at a small discount and resells them under their own name. It is little more than a rebadging exercise and does nothing beyond raising the MVNO's profile in the mobile market segment.

- The true MVNOs buy minutes, texts and data in bulk and provides its own SIM card to its customers. The level of investment required by the true MVNO is much higher - they need to hire a product team and have billing capability for instance - but the rewards are also much greater. They get more control and they should get a better margin.

MVNOs first appeared in Denmark, Hong Kong, Finland and the UK and today exist in over 50 countries, including most of Europe, United States, Canada, Australia and parts of Asia, and account for approximately 10% of all mobile phone subscribers around the world.

Practice Notes

- ■ **Infrastructure Sharing in India – An Imperative for Sustained Growth**

- ■ **Mobile Sharing in the European Union**

- ■ **MVNOs Classification and Marketing strategies**

- ■ **Sharing Mobile Network Infrastructure in India**

Reference Documents

- ■ **BEREC report on infrastructure and spectrum sharing in mobile/wireless networks, June 2011**

- ■ **Botswana: Guidelines on Sharing Communications Infrastructure, January 2010**

- ■ **GSR 2008 - Mobile Network Sharing,**

- ■ **India -- TRAI's Recommendation on Infrastructure Sharing**

- ■ **Malaysia: Guidelines on Regulatory Framework for 3G Mobile Virtual Network Operators, February 2005**

- ■ **Ofcom, Application of spectrum liberalization and trading to the mobile sector (20 September, 2007)**

- ■ **Ofcom, Second consultation on assessment of future mobile competition and proposals for the award of 800 MHz and 2.6 GHz spectrum and related issues, 12 January 2012**

2.6.7 ENHANCING COMPETITION

While many markets can support mobile competition, regulation may be necessary to support the competitive process. Apart from stopping **anti-competitive conduct**, there are some regulatory initiatives which could support a more competitive mobiles market.

With digitisation regulators will come under pressure to protect mobile operators from **'over-the-top'** applications that reduce the voice and text revenues that are significant for mobiles. However, mobile operators should be encouraged to adapt their business models to accommodate competition (see **Box 2.10**). These applications will make regulatory initiatives like mandated call selection redundant [*].

A regulatory instrument that has been used extensively to promote competition in mobiles is mobile number portability (MNP). European Law treats number portability as a human right under the EU Universal Service Directive that has applied since July 2003. But in other countries, especially smaller developing countries, the benefits and costs of implementing number portability should be considered carefully. The technical options employed in large markets for MNP may be too costly for small countries and they will be overtaken by technological changes which will change how we think about numbering and customer switching.

◀ **Box 6.10: Bahrain and MNP**
Source:
http://www.tra.org.bh/en/pdf/NP_LaunchPressReleaseEnglish.pd

> The Telecommunications Regulatory Authority (TRA) got interested in mobile number portability in 2003 and decided to proceed in 2008 and implemented MNP in July 2011 (and fixed number portability in October 2011).
>
> Mobile porting takes place within 1-3 days for mobile with subscribers given a new SIM card. The maximum porting charges will be BHD 4 (about US$10).
>
> The TRA, which is bearing the costs of the centralised system, is hoping that up to 20 per cent of mobile customers will exercise the MNP option.

The SIM card that links each customer to a mobile operator can also present a barrier to switching [*]. On some networks, the mobile phone is 'locked' so that specific carrier's SIM cards will work. This is more common in markets where mobile phones are heavily subsidised by the carriers, and the business model depends on the customer staying with the service provider for a minimum term (typically 12 or 24 months). Common examples are the GSM networks in the United States, Canada, Australia, the UK and Poland [*].

In countries where the phones are not subsidised (e.g. Italy, India and Belgium), all phones are unlocked. Where the phone is not locked to its SIM card, the users can easily switch networks by simply replacing the SIM card of one network with that of another while using only one phone. Customers may swap SIM cards to change an off-net call into an on-net call; or to access better international call rates on another operator.

Practice Notes

- ■ **Mobiles: Customer Lock-In**

Reference Documents

- Bahrain, A Cost-Benefit Analysis of Implementing Mobile Number Portability in Bahrain, February 2008

- Bahrain, Number Portability Specifications Consultation Report, March 2011

The ICT Regulation Toolkit is a joint production of infoDev and the International Telecommunications Union (ITU).