A Spectrum of Regulations: Mobile Telecom Regulation in the Middle East and North Africa

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The Middle East and North Africa region (MENA) is presently undergoing a significant transformation in its telecommunications sector. In late March 2009, Jordan’s first 4G WiMAX service was commercially launched by Motorola and Mada Communications of Kuwait. A few weeks earlier, Bahrain awarded its third mobile licence to Saudi Telecom Co. Tunisia is currently holding a tender for its first technology-neutral global licence for the provision of both fixed and mobile voice and data services, using a choice of 2G, 3G, CDMA or WiMAX technologies, with bidders including France Telecom and the Turkish mobile operator Turkcell. However, alongside this flurry of activity involving a diverse group of international players, Algeria and Lebanon have both recently announced decisions to postpone the much-anticipated privatisations of their respective telecom companies, revealing that liberalisation in the MENA telecom market is not to be taken for granted.

These news highlights from MENA illustrate the importance of two central elements in today’s telecom sector: internationalisation and active policy-making. Communications capabilities are so integral to today’s global economy that a state must support accessible, cost-effective and efficient communications services in order to become competitive in the global
economy. From placing an overseas import or export order to following the exchange rates of the day, the ability to communicate instantly is not only expected, but required, in our fast-moving economy. While regulatory leaders in MENA strive to support these goals, the introduction of different technologies has met with varying success. Mobile phones, for example, have enjoyed a much higher penetration rate than broadband internet. In spite of the widespread popularity of the internet, regional players have struggled to achieve high penetration rates for broadband internet service. Telecom regulation will be highly influential in inhibiting or fostering the growth of the broadband internet sector in MENA in the years to come.

This paper will explore the various initiatives that telecom regulators in MENA should consider for the promotion of broadband internet access, and wireless broadband in particular. There is a wide range of regulatory tools available to states, including: spectrum allocation; network sharing and competition; content regulation; tariff regulation; taxes and subsidies; frequency regulations; technical certifications; and so-called lawful interception. This paper focuses on the threshold issue of spectrum access, which lies at the core of recent MENA developments excerpted above. The benefits of sound regulation in this area would likely include growth in broadband internet usage, greater foreign investment, increases in the sharing of information (in turn increasing labor productivity), technological innovation and overall economic growth.

The appeal of wireless broadband in MENA

Like in many developing countries, the MENA telecom sector has struggled with an underdeveloped wired infrastructure, which has historically resulted in low penetration levels for fixed telephony services, particularly outside of densely populated urban centres. Even for the (relatively) technologically well-connected urban population, initiating a new landline phone service required a long process of application and installation, usually rife with bureaucratic red tape. The telecom sector in MENA was permanently changed, however, with the advent of the mobile phone service. The wireless capability of this new service introduced an efficiency and cost-effectiveness that traditional wired services could not afford. No longer did setting up a phone line require a human being from the state-run telecom company to physically bring the actual phone line to the house. Mobile phone technology allowed setting up a phone line to be as easy as buying a new phone chip from the local grocery store. The subsequent boom that followed resulted in the telecom industry being one of the fastest growing and most profitable industries in the region.
Today, MENA’s telecom sector is again facing the risk of stagnation in technology and penetration. While many states are quickly approaching or reaching peak penetration levels in the mobile phone market, internet access, one of the most basic forms of telecom service, is not yet widespread. For a variety of reasons, broadband internet access has not achieved the same successful penetration rates as enjoyed by mobile phone service. Part of the problem is that traditional DSL and dial-up internet services require the same wired infrastructure that inhibited landline phone service growth in the past. For this reason, the development of a wireless broadband internet technology called World Interoperability for Microwave Access (WiMAX) has generated excitement in telecom industries across the world as a cheaper, less-labour intensive and more effective means of providing broadband internet service. In effect, WiMAX has the potential to be to internet access as mobile phones were to phone access.

WiMAX is not unknown in the Middle East, and in fact, some countries such as Algeria which launched a commercial WiMAX service in 2005, were among the earliest adopters of WiMAX in the developing world. Investors in the region continue to be excited about the potential that WiMAX offers. Tunisia, Libya and Egypt all have WiMAX services, and Jordan just launched its own WiMAX service in March 2009. But a growth spurt in broadband service penetration cannot be achieved through the effectiveness of the technology or the enthusiasm of investors alone. Among other obstacles, a restrictive regulatory regime threatens to inhibit the potential for WiMAX growth in the region.

**Spectrum allocation: bandwidth and frequency**

The future success of WiMAX is contingent upon the availability of sufficient spectrum. Regulators’ unwillingness to allocate sufficient spectrum has been the death knell for WiMAX and its developers throughout the global market. Regulators who support the growth of WiMAX must first and foremost secure sufficient bandwidth for wireless broadband. In its nascent stage, WiMAX services may not require a great deal of bandwidth, but if its growth is expected to spike, then states must ensure that either enough spectrum is allocated at the beginning, or that there is an efficient way to allocate additional spectrum when the time comes.

The allocation of low-frequency bandwidth is the second prerequisite for the growth of WiMAX. Lower frequencies are especially valuable because of their ability to transmit higher volumes of information more efficiently. In turn, what distinguishes WiMAX from other internet services is the ability to make their services available to a larger number of users more quickly and at a lower cost. Thus, while WiMAX service does not de facto require more
bandwidth than wired broadband, if regulators achieve their goals of higher broadband penetration rates, then the additional subscriber traffic will require WiMAX providers to have more efficient and larger allocations of spectrum. For example, according to the Egyptian Telecommunication Regulatory Authority, several bands of the 30 GHz spectrum are currently allocated for WiMAX services. This band of spectrum comes under the extremely high frequency (EHF) category of frequencies, and unlike lower bands, EHF frequencies are prone to atmospheric attenuation. This means that the signal fades over long distances and is often vulnerable to interferences. While low frequencies of spectrum such as this one may be sufficient as states begin to experiment with WiMAX, only higher frequency allocations would be able to support the commercial viability of WiMAX services. Prime spectrum at lower frequencies such as ultra high frequencies (UHF) and super high frequencies (SHF) are not yet widely available for licensing to wireless broadband because they continue to be used for other applications such as television broadcasting.

For example, one of the main obstacles to the growth of WiMAX in Western Europe has been the lack of low frequency spectrum access. Throughout most of Western Europe, WiMAX operates in the 3.5 GHz band, which does not support commonly available mobile services. By contrast, regulators in Eastern Europe, and parts of Scandinavia were the earliest to allocate 2.5 GHz spectrum to WiMAX, and the technology has enjoyed substantially more success in these countries as a result.

But the example from the United States (when television broadcasters were required to transition all their analog services to digital broadcasts in order to free the 700 MHz spectrum) should also warn us that the shift of applications operating on lower frequencies to other frequencies can be a time consuming and onerous process. MENA regulators intent on WiMAX growth should focus on preparing to license this and other valuable spectrum to high bandwidth technologies.

**Licensing terms: neutrality, duration, exclusivity, assignment restrictions, asset transfer**

Focusing on discrete licensing terms can allow regulators to create a variety of legal structures for more effective negotiation, structuring and implementation of telecom licences. To advance wireless broadband access, regulators should especially strive to refine an economically viable combination of licence duration, technology-neutrality, licence exclusivity, assignment/buyback restrictions, and post-expiration asset transfers. Of course, the most appropriate confluence of such provisions will depend on the particular context of the national industry.
Neutralitiy

Historically, regulatory authorities in MENA began liberalisation by issuing technology-specific licences, requiring a licence holder to use a specifically mandated technology when operating within that allocated spectrum, thus also restricting the corresponding services. For example, the earlier mobile licences granted by Egypt were specific to 2G technology. However, the third mobile licence granted more recently in 2007 was technology-neutral (it was open to 2G, 3G and CDMA), which put the initial licence holders under a competitive disadvantage and forced them to acquire separate 3G licences. Likewise, many European mobile licences, such as the German WiMAX licence granted in 2007, have been technology neutral. One of the problems with the technology-specific structure is that the licences can only accommodate the technological realities of the present. When the application of the technologies surpass the boundaries that regulatory authorities establish, licensed companies are stuck with obsolete licences; licences for obsolete uses clutter the spectrum, leaving less spectrum for the state to allocate to new uses; and consumers are stuck with technologically outdated and inferior service. In addition, when only new licences are allowed to accommodate new technologies, veteran telecom actors find themselves at a disadvantage vis-à-vis new technologies and services. Thus, technology-specificity can be bad both for the consumers and the industry.

The most obvious way to alleviate these restrictions is to issue technology-neutral licences, which allows licensees to use the allocated spectrum for a range of services with their choice of technologies, including multiple technologies side-by-side. Tunisia and Egypt are already experimenting with this solution. In 2006, Egypt awarded a technology-neutral licence (its third overall licence) to Etisalat Egypt. In the second half of 2009, Tunisia expects to award its first technology-neutral licence.

Duration

While a few MENA countries have been willing to experiment with technology-neutral licences, other MENA regulators remain wary of this licence structure because it forces them to relinquish control over the industry. Altering licence duration could alleviate this concern. Regulators that are concerned about relinquishing control can still leverage influence by reducing the length of the licences, which can currently run up to 35 years, to shorter periods of time. The mobile licences in Saudi Arabia, for example, were granted for terms as long as 25 years (contrast with the early mobile licences in continental Europe, which were usually no longer than 15 years). In the past, such long periods may have been economically and technologically
efficient, considering the infrastructure required to deliver services under a telecom licence. Today, the growing use of wireless technologies and the ability to update hardware wirelessly means that the use of new technology will not require the expensive and overarching infrastructural updates of the past. With technologies such as WiMAX, service providers have fewer and cheaper physical hubs that require updating, as well as the ability to update the end-user’s consumer device.

_Assignment restrictions_

The lack of an option to sell back the licence to the government or the option to sell spectrum in secondary markets to third parties (for example via ‘spectrum trading’) can be another obstacle to the growth of WiMAX, especially if regulators continue to issue exclusive technology-specific extended term licences. Without such options, large amounts of unused spectrum (also known as ‘white space’) can be a burden on a sector that requires large amounts of spectrum to satisfy service demands. Moreover, as a result in changes in technology or business priorities, some licensees may hold spectrum they no longer need, and might want the flexibility to sell or sublet their surplus spectrum. Regulators can facilitate this by allowing licence holders to sell their spectrum licence back to the government before the licence term expires, or even go a step further and allow ‘spectrum trading’ among parties. However it is generally accepted that a secondary trading market will be successful only in the context of spectrum liberalisation, which should be a significant policy focus in the MENA region. In particular, if the regulators hope to develop spectrum trading, then they should also allow the buyer to change the application to which the spectrum is put, the use of the spectrum, the technology to be employed, as well as other variables such as transmitter power, frequency and bandwidth. Without the promise of such flexibility (the so-called ‘command-and-control’ approach to spectrum management), it would be difficult to imagine many potential buyers willing to participate in such secondary markets. Again, of course, the optimal balance between the right amount of spectrum management liberalisation and the issuance of technology-neutral licences will depend on the particular dynamics of any given MENA market.

_Exclusivity_

Exclusive licences mean that the licence holder is entitled to the exclusive use of the allocated spectrum (rather than having to share the network with other telecom operators). This would be the telecom equivalent of leasing real property for exclusive occupancy. As broadband internet access becomes
more popular and bandwidth becomes more congested, regulators will have to consider ways to accommodate heavier traffic. In the past, it may have been important for regulators to guarantee the ‘exclusive use’ rights for a spectrum because most technologies transmitted bulky and inaccurate signals, meaning that if more than one entity attempted to use a spectrum to transmit information, the two transmissions could interfere with each other. However today, many of the available technologies are far more precise and occupy less space. This means that a telecom provider’s quality of service would not be affected if it is required to share the spectrum space with others (for certain uses). For example many, though not all, European regulators have encouraged network sharing, particularly when it was seen as accelerating the introduction of 3G services.

In another example, in 2008 the United States Federal Communications Commission (FCC) approved for the first time a type of wireless device that would utilise the white space on allocated spectrum that is not used by the spectrum’s licensee(s). These devices, also known as white space devices (WSDs), are able to detect white spaces on the spectrum and transmit data without interfering with existing transmissions. In effect, WSDs are able to navigate the space above, below, between and around the signals transmitted by the licence holder, carefully avoiding a collision and other interference with the licence holder’s use. Though this technology is still being refined, it introduces a significant possibility for the future use of spectrum. According to the model contemplated by the FCC, rather than being left dormant, superior spectrum white space could be accessed by secondary users, so long as they do not affect the licence holder’s use. It is not clear whether these devices would violate the exclusivity of licences that current MENA regulators have issued, since WSD users would be unlicensed. Regardless, it is important for MENA regulators to follow the developments of these technologies, and to consider the ways in which WSDs can be exploited once they become commercially available.

Regulators should also begin contemplating the possibility of an ‘open spectrum’, also known as ‘spectrum commons’. Under this regime, regulators would not assign licences for the exclusive use of spectrum to anyone, but instead would approve particular devices that could then be used by all to access these allocated bands. There already are some frequencies that are ‘unlicensed’ or ‘licence-exempt’ such as those used by cordless phones, microwaves or routers that provide wireless internet transmission. However, the frequencies required by these devices are generally high level frequencies, which were previously referred to as ‘garbage frequencies’ before consumer devices were developed for their use. The open spectrum regime would require regulators to ‘open’ lower, more superior frequencies for unlicensed use. The recent development
of more precise, smaller transmission signals alleviates most of the prior concerns about interference that served as the initial impetus behind the ‘exclusivity’ of licence allocations. MENA regulators mindful of the fact that spectrum congestion will progressively worsen as wireless technologies become more popular should consider this type of spectrum sharing in order to increase the productivity of spectrum bands.

Asset transfer

In the context of telecom privatisation, it is important to distinguish between the sale of state-owned assets on the one hand, and concessions for the use of state-owned assets on the other. States have historically treated telecom licences as the latter, leasing spectrum for a limited period of time for private companies to use with their own assets and technologies. Under this structure, all assets developed or acquired by the licence holder, together with any improvements on existing assets, belong to the licence holder and would not be converted into state property at the end of the licence period. Some vested interests in MENA have argued that all telecom assets are national resources and therefore private companies cannot or should not be allowed to gain full and permanent ownership of these assets. However, unlike in the build-operate-transfer concession agreements in the infrastructure context, the bidders in telecom licence tenders have, up until now, assessed the value of the licence on the assumption that they will not be dispossessed of their assets and technologies at the end of the licence term. MENA regulators considering whether to adopt build-operate-transfer concession type agreements for telecom licences must not do so without considering some crucial issues. Among them is the problem that regulators will have in attracting investors who are willing to bid on a telecom licence with this provision. A private company would likely develop significant assets over the licence period, particularly if the licence is held for multiple renewed periods. Thus these private companies stand to lose a considerable quantity of assets at the licence end. Licence holders with telecom assets that are subject to an asset transfer provision are also likely to encounter serious difficulties in securing financing from banks and other lenders, since they do not technically own the assets against which they would be borrowing. Lastly, these provisions seriously undermine the leasing and buy-back options discussed above, which are important to the efficiency and growth of the telecom sector. These restrictions among others risk driving away the most sophisticated and experienced telecom investors from the market. Not only does this restriction deprive the sector of quality and knowledge, but fewer bidders means that the licence sale will be less competitive, thus resulting in less overall licence revenue for the government.
Collateral effect of other regulation: Voice over Internet Protocol

The increased demand for Voice over Internet Protocol (VoIP) services will likely boost the demand for wireless broadband internet services. Though ostensibly accessible via dial-up internet, the quality of VoIP calls over broadband services is on par with if not better than traditional phone calls. International VoIP calls are also cheaper than traditional phone calls, thus making VoIP a serious long-term rival to fixed and mobile telephone services. However, regulators in Oman, Jordan and Qatar, for example, have all at some point outlawed VoIP services such as Skype, while states like the United Arab Emirates continue to make Skype and other similar VoIP calls illegal. These restrictions could be due to various reasons, including concerns about national security (services such as Skype automatically encrypt voice conversations, thereby making it more difficult to tap conversations) and protecting existing telephony providers.

The introduction of a cheaper VoIP alternative to costly mobile and fixed phone services would likely result in increased demand for VoIP and broadband as consumers’ expectations of easy, cheap communication shift. It was relatively recently that email was introduced in the region as a faster alternative to traditional mail and a cheaper alternative to traditional phone calls. Today, e-mail use is a relative norm. Internet cafes have become ubiquitous on the urban landscape, serving customers who cannot or have not purchased home computers and internet access. Yet in spite of its widespread use, much of the region accesses the internet through dial-up connections – an almost obsolete form of service in North America, for example – and rural areas remain as disconnected and isolated from the world as they have always been.

VoIP and broadband service providers stand to gain from another paradigm shift in the way people expect to use communication technologies. As demand increases and broadband access becomes as common place as phone or e-mail access, the revenue generated from a growing base of VoIP and broadband subscribers will likely offset the decrease in revenues experienced by fixed phone service (particularly international phone service) providers. WiMAX’s few successes in the United States, for example, are due in large part to the economical alternative that WiMAX offers to traditional fixed phone and internet lines – particularly in rural areas.

In fact, while data service licence holders in some countries like Egypt specialise exclusively in data services, and are thus potentially in direct competition with fixed and mobile telephone licence holders, in other countries such as the United Arab Emirates, one company (in this
case, Etisalat) offers the full range of telecom services and will benefit regardless of how the VoIP and broadband markets turn. Regardless of how many companies dominate the telecom market, the local telecom industry as a whole and its labour force would benefit from the increased demand for broadband.

Regulators are less able to protect veteran telecom actors that only provide fixed or mobile phone services, because these services will undoubtedly experience a loss in revenue as the popularity of VoIP increases. However, regulators that want to protect these players can still do so by converting outstanding licences to technology-neutral licences. As discussed above, this change would allow fixed and mobile phone licence holders to adopt new technologies such as those providing broadband, which would allow them to compete in a new telecom market where traditional fixed line phone services are progressively becoming obsolete.

States can also benefit from VoIP through various taxation regimes. They can tax companies for phone credits purchased for VoIP calls, or they can charge a premium to VoIP callers. In countries where the telecom industry is monopolised by a state-run entity and the broadband infrastructure is underdeveloped, the state telecom company has an added incentive of limiting VoIP use because of limited bandwidth. In these instances, rather than limiting VoIP access, the broadband internet provider can simply charge a premium for certain types of high bandwidth activities, such as VoIP calls.

**International obligations**

As discussed above, internationalisation was one of the driving forces behind MENA’s flourishing telecom sector. Many fixed and mobile MENA telecom licences are awarded to foreign companies, from both inside and outside of the region. For instance, Saudi Oger controls a majority stake in Turkey’s fixed line telephone company, while UK-based Vodafone is a major telecom player in Egypt, the United Arab Emirates, Bahrain and Qatar. Accordingly, regulators should be mindful of their country’s obligations under international treaties when implementing either the regulations discussed above or any other regulatory frameworks affecting their telecom sectors. For example, telecom services are subject to international trade rules within the framework of the World Trade Organization’s General Agreement on Trade in Services (GATS), which provides guarantees for reasonable access to and use of public telecommunications in a given market, by suppliers of all services benefiting from commitments scheduled by the member
concerned. Any violation of such rules by a MENA state could result in a suspension of trade concessions by the counterparty state that is harmed by such violation, and therefore any proposed regulation should be carefully vetted in the context of the potentially serious repercussions for failure to honour international commitments.

**Conclusion**

From the introduction of satellite television to the explosion of mobile phone use, consumers in many parts of the MENA market have come to feel and expect a level of interconnectedness that matches the expectations of consumers in more developed economies. While the success of the mobile phone industry has provided many MENA consumers with a mobile phone service that is on par with that in European markets, it remains to be seen whether the telecom giants of the region will fall behind the great advances they made in connectivity when it comes to broadband internet access. Though fixed broadband services posed serious obstacles that could not even be overcome by fixed phone service providers, the advent of wireless broadband internet service – WiMAX – has provided the regional telecom industry with the opportunity to grow and again produce the high penetration levels it enjoyed among mobile phone subscribers. But the great potential of the technology and the enthusiasm of investors is not enough to guarantee the success of WiMAX in the region. Without the help of regulators and a new regulatory regime that can accommodate this technology, WiMAX may be stifled for far longer than the consumers in MENA would expect.