

Licensing to support growth of broadband

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1 Need and benefits of broadband

In majority of the countries about a decade and half ago, voice was king, internet was a value-added service and broadband was a luxury. Now whole scenario has changed, voice, because of mobile cellular operators, is ubiquitous, internet is part of basic telephony and broadband is increasingly considered as a human right.

The World Bank has found that in low and middle-income countries every 10 percentage point increase in broadband penetration accelerates economic growth by 1.38 percentage points, more than in high-income countries and more than for fixed and mobile telephony and internet¹.

Broadband has become a tool for economic, social and lately political growth cutting across all other sectors making it extremely important for the governments and the regulators to develop appropriate regulatory and licensing frameworks for faster deployment of broadband networks and promotion of affordable broadband access.

2 Licensing framework

Licensing two decades ago was a relatively easy thing. For monopoly government operators, legislation was the license and for new entrants initially the leftover areas which did not fall in the monopoly were to be licensed. These initial licenses were very detailed documents including everything under the sun to overcome lacunas in applicable laws. Mobile licensing was made possible because of the technology debate, falling outside monopoly domain of basic and international telephony.

Later with liberalization or de-regulation efforts were made to license every technology and service separately resulting into unmanageable list of categories. In the last decade efforts were made to rationalize this crazy licensing and reduce the categories, which lead to unification of licensing. India unified only access licenses, whereas Nigeria went for complete unification. Convergence in the ICT sector motivated the converged licensing, which also reduced the categories of licenses to four in Malaysia, three in Papua New Guinea and two in Singapore.

¹ World Bank (2009) Information and Communication for Development: Extending reach and increasing impact

Any licensing framework should be based on the fundamental principle of providing conducive environment to make investment in the networks and delivering affordable ICT services. The best way to do that is to remove artificial barriers to entry (and allowing easy exit), avoid unnecessary and burdensome obligations and intrusive regulations.

2.1 Market Structure & entry

A licensing framework and number of players in the market largely depends on the design of the market structure. In economics terms market structure is defined as the degree of competition in a particular market: monopoly, oligopoly, monopolistic competition and perfect competition.

Monopoly is where only one supplier is in the market and freedom to entry including exit is either completely blocked or has very high barriers. Oligopoly has few players and entry is restricted. In both monopolistic competition and perfect competition players are several and freedom to entry is unrestricted but the nature of the product is differentiated in monopolistic competition and homogeneous in perfect competition.

In the ICT sector there is a growing consensus that in the absence of demand for scarce resources freedom to entry should be unrestricted and the market should be allowed to decide about the number of players. However in case of scarce resources number of players should be limited only by the availability of the resource and in the case where demand exceeds supply, market methods should be adopted to allocate the resource. However this does not mean that the regulator and government should not look at the appetite of the market to decide what is the optimal number of players. For example in case of mobile licenses many countries are of the opinion that four is an optimal number both in terms of healthy competition and viability of business². In Pakistan and Bangladesh fifth and sixth operators remain struggling. Similar situation is in India and Indonesia.

How many are too many in a particular market? Is a billion dollar question. This can be determined by a country based on its priorities, market appetite and other relevant limitations: e.g., in case of spectrum, limitations would be availability of spectrum for commercial use, technological developments in different bands, and minimum band required to run an optimal service.

² <http://www.sunriseconsultants.com/mobilelicences.html>

Next question, equally expensive, comes whether the licensing or authorization should be vertical or horizontal, national or regional, service specific or service neutral, individual or class, facility based or non-facility based? No matter what is the nature of the license, if the objective is to provide modern telecommunication services at affordable prices and there are no biased exclusions, any structure will do.

A market structure would remain faulty and may lead to market failure if bottlenecks are not addressed. Generally the bottlenecks are essential facilities, international gateways and international connectivity. In some of the Pacific countries, domestic connectivity and transmission is a bottleneck e.g., Papua New Guinea and Tuvalu. The best way to handle these bottlenecks are encourage or mandate sharing of infrastructure, regulate wholesale tariff, liberalize international gateways and have virtual landing points (VLP). Even if there are a limited number of landing points or submarine cables, competition can be introduced by facilitating establishment of VLPs. Countries which have adequate local content should also consider establishing Internet Exchange Points (IXPs) to reroute local traffic without using international bandwidth.

2.2 Licensing models

There are all sorts of licensing models available ranging from vertical to horizontal, national to regional, service specific to service neutral, individual to class to registration, facility based to non-facility based.

There is no one-size-fit-all kind of off-the-shelf licensing framework available. Licensing depends on national priorities, demography, and other unique national characteristics. China has its own peculiar national licenses, whereas its equally populated neighbor, India has licensing circles, Malaysia opted for converged license with four categories, Singapore went for two converged category but Indonesia has individual licensing. In terms of unified licensing, Nigeria went for complete unification, whereas India unified only the access part of the telecommunication service. Even within the same country, it is possible to have multiple frameworks or market structures e.g., for mobile cellular Pakistan has national licenses but for local loop, licensing is regional.

Ideally the regulators should introduce simpler licensing regimes, reduce number of categories to manageable level, and avoid arbitrary or technical exclusions. Even if a country has not moved to unified

or converged licensing, it can still achieve it by allowing cross ownership of licenses: voice operator may be allowed to enter broadband, IGW³ and virtual licensing points (VLP) markets.

Regulators should also be mindful of the fact that unnecessary complicated and confusing licenses will make their job difficult.

2.3 License neutrality

Technology neutrality in licensing was introduced sometimes ago and now the trends is towards service neutral licenses. But does this technology and service neutral licensing regimes eliminated the need to look at the technology deployment and service provisioning by the operators? Unfortunately this did not happen and we still have to do type approvals and develop QoS⁴ for different services. Upward revision of broadband speed may not always be technology neutral. Most difficult challenge now is that; it is possible now to provide same service through multiple technologies and also same technology can deliver multiple services. Even a single operator may be using multiple technologies to provide same services. Regulators have never faced with this kind of challenge before.

For every regulatory intervention, regulators have to go through all the underlying technologies to make sure that the regulation and obligation to be imposed can be put across technologies, thereby qualifying to be technology neutral regulations.

Hypothetically if a license gets a technology and service neutral license with spectrum and then decides to deploy an obsolete or dying technology. In such a situation it is going to be extremely difficult for the regulator to stop the licensee unless and until there are express provisions in the license or legislation.

Similarly in a service neutral license, Regulator cannot force a particular license to provide a particular service therefore there cannot be service related QoS obligations. So what we might end up with is; either multiple licensees in market but no service or multiple services but no quality.

Solution for such a situation could be to have a particular service related QoS, roll-out and other obligations in the license at one of the attachments or in the Regulations with a caveat that if the licensee decides to provide that service, he must give a notice to the Regulator and the associated

³ International gateway

⁴ Quality of Service

obligations will automatically be triggered. But to motivate a licensee to provide a particular service would be tricky and we have to rely on market forces there.

2.4 Broadband licensing

In most of the countries, initial licensing categories for data were ISP⁵, VSAT etc., and still many countries lack a broadband license per se. This trend was changing recently with BWA⁶, WiMAX and 3G licensing but now with class licensing and unified/converged licensing it is again diluted.

Moving from technology neutrality to service neutrality makes the subject more complex because now it is extremely difficult for licensor to put all service definitions with QoS⁷ in the license. A licensee may not like to provide all the services he is allowed unless in the license there are lists of mandatory and optional services.

In a situation where there is no broadband license, it is going to be difficult to enforce obligations related to provision of broadband service. One solution could be to have the obligations in the regulations instead of license document but identifying who is a broadband provider and who is not, would still remain a challenge. However there are still players who would be happy to continue providing narrow-band service like Indian UALs⁸ left out in recent 3G and BWA auctions.

Owning a particular spectrum could be an indication but availability of multiple technologies in the same band would make it difficult to pin point. Now this brings the challenge of who should be burdened with broadband QoS: the one who has the relevant spectrum? Not sure because now multiple technologies runs in same space (2G/3G in 900, 2G/4G in 1800). Copper wire operator has a choice between dial-up and xDSL.

Should we leave it to the judgment of the operators or should we push them to be more efficient in terms of using the resources they are sitting on. It would be a challenge for regulators to push narrow-band operators to move to broadband by deploying efficient technologies for optimal use of spectrum. There are still chances that some licensee may avoid QoS obligations by claiming he is not a broadband company but still provide comparable service using a fancy name (e.g., fastest internet). They may avoid

⁵ Internet service provider

⁶ Broadband Wireless Access

⁷ Quality of Service

⁸ Unified Access Licensee

QoS requirements of broadband but compete with broadband operators who may have stringent QoS obligations. Vonage is a good example; which called itself a broadband phone company⁹ but was competing with voice operators without fulfilling the obligations applicable to voice operators.

For the purpose of regulating broadband service, having a broadband license would be an easy solution, however the countries have moved towards Unified or Converged licensing therefore it would be extremely difficult for them to roll back to service-specific licenses. One way to do this could be to impose QoS for broadband on operators who are sitting on broadband resources and push them to provide broadband services, if spectrum or resource (e.g., copper wire) they hold, has the capability to provide broadband.

2.5 Licensing fees

Higher license fees are also considered a barrier; therefore it should be at the minimum, to recover the cost of regulation and the regulator should not assume the role of tax collector for national exchequer. Sector specific taxes, other than the cost of regulations, should not be there at all. The Brazilian government has issued a law offering tax breaks for new telecom investments.

One can argue that in market methods it is the bidders who decide the upfront fee but it has been seen that most of the time such fee is direct result of auction design and artificial scarcity created by the regulators. A comparison of Indian 3G and Pakistani cellular license auctions¹⁰ can clearly show the difference.

2.6 Detach spectrum from service license

Spectrum being the scarcest of the scarce resources should be detached from service license, making open licensing possible and lowering the barrier to entry. The Indian experience of attaching start-up spectrum with Universal Access License in an open licensing environment did not go well¹¹. In case, spectrum remains as integral part of the license, number of entrant will have to be restricted; this will restrict competition in the market.

Regulator may adopt open licensing regime with operating or service license, however spectrum license has to be treated differently. Experience shows that administrative procedures to allocate spectrum has

⁹ <http://en.wikipedia.org/wiki/Vonage>

¹⁰ <http://voicendata.ciol.com/content/ContributoryArticles/110053102.asp>

¹¹ <http://www.indianexpress.com/news/who-can-afford-such-whimsy-/620052/>

inherent transparency issues and it is better to use market methods, which are transparent and put appropriate value to the spectrum.

Administrative methods may be adopted if the demand is less than the supply or in a matter of renewal and some credible benchmarking for pricing it is available. International benchmarking of comparable countries can be used, if domestic benchmarks are not available.

Recently in Bangladesh, in matter of renewal of mobile cellular licenses, very high and asymmetrical fees were proposed by using some non-transparent method¹².

2.7 Spectrum fees

The resources required for spectrum management is quite huge and include; skilled labour, investment in technical monitoring equipment. The money required to run a spectrum regulatory agency has to be generated and normally regulators charge initial and recurring fees, determined through administrative and market methods, to cover the cost.

These spectrum fees can also be used to guide users in making decisions to use spectrum more efficiently. There are different ways to determine fees and one example could be to set a charge for spectrum equal to an estimated market value. Alternatively, prices can emerge through an authentic market transaction such as an auction or secondary trading.

Auctions are well-known means of using market-generated prices to assign spectrum at time of its initial allocation and administrative means are used for recurring fees. Recurring fees could be flat or percentage of licensees' revenue.

2.8 Availability of spectrum

There must be adequate spectrum available for anyone wishing to provide telecommunication service, and if the demand is more than the supply then the best way to allocate spectrum is through market methods. The operator, who values the spectrum more, will most likely to use it more efficiently. A non-transparent administrative method including first-come-first-serve, for a finite resource is a not a good idea.

¹² http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2032127

Governments and regulators should free up more and more spectrum for use of ICT services. The transition from analogue television to digital television will free up significant Digital Dividend spectrum, which may be reserved for telecommunication.

In order to be future-proof, make spectrum allocations for flexible use (technology neutral) with adequate safeguards to make sure that inefficient or outdated technologies do not creep in.

It is argued by industry players that the spectrum should be with operators and not to be left with regulators or spectrum allocating agency. In such a situation where commercial spectrum is exhausted or fully allocated, the best way to address shortage of spectrum and reallocate spectrum is allowing spectrum trading in the secondary market. Spectrum refarming both by regulators and operators should also be encouraged.

Scarcity of spectrum can also be addressed by increasing unlicensed bands and gradually moving towards spectrum commons¹³ in selected bands. This will make it possible for multiple operators to share the same spectrum and would also allow innovation and cheaper services. Wi-Fi is a good example of it.

2.9 Allow spectrum trading

When spectrum is initially allocated, auctions can create competition for spectrum, later the only way to create efficient competition is to allow spectrum trading in secondary market, if otherwise spectrum is unavailable. Spectrum trading contributes to more economically efficient use of frequencies and boosts transparency by revealing true opportunity cost of spectrum. Of course, it only takes place if spectrum is worth more to new user or entrant than it was to old user.

2.10 Exit regulations

In economics, barriers to exit are hurdles for a firm which wants to exit a given market or sector. These hurdles often cost the firm financially to leave the market, which may be prohibitory. If barriers of exit are significant; a firm may be forced to continue competing in a market, as costs of leaving may be higher than those incurred if they continue in the market.

¹³ <http://stakeholders.ofcom.org.uk/consultations/scc/statement/>

Lack of proper exit regulations has serious consequences, as more firms are forced to stay in a market, competition increases within that market. This negatively affects all firms in the market and profits may be lower than in a perfectly competitive market. The exit barriers for incumbents create entry barriers for entrants.

Entry barrier include exit barrier. If there is no exit path for a new entrant, he would be reluctant to enter the market and make investments. Telecommunications is a capital intensive sector with high sunk costs and absence of exit regulations makes it difficult for efficient players to enter and inefficient operators to exit. A mere surrender clause in licenses does not qualify to be an exit regulation

Exit regulations give confidence to new entrants and keep telecom sector growing and viable as inefficient players are allowed to vacate space for efficient players. It also helps in bringing down level of “perceived competition” to more realistic level (because of exit by some of the operators).

Some possible options for exit regulations could be:

- Return of entry fee;
- Return of fee for un-utilized spectrum;
- Release of bonds & bank guarantees;
- Permission to sell network & infrastructure;
- Transfer/sale of license & spectrum; and
- Compensation, if Regulator/Government responsible for failure.

2.11 Introducing more competition

ITU data suggest that the principles of privatization, liberalization and competition in the last two decades have been the key factors in making voice communication ubiquitous. Same principles can be applied to achieve increased penetration of broadband.

Introducing competition at all levels of the broadband value-chain will be the right step in moving forward. Competition can be promoted through licensing, encouraging cost-oriented infrastructure sharing, regulating wholesale tariffs and liberalizing international gateways. Increasing competition at the bottlenecks has always shown positive results. The arrival of four new international submarine fibre-

optic cables in South Africa between 2009 and 2011 has brought down the cost of international bandwidth dramatically.

More competition gives more choice to consumers and increased efficiency in the market.

2.12 Defining Broadband

Discussion with broadband licensing is not complete unless broadband is defined as issues related to QoS and consumer protection are linked to it. Broadband, a term opposite to narrowband, does not have a universally acceptable definition and may vary country to country and user to user.

Defining broadband is yet another tricky issue primarily because the earlier definition of broadband was technology-centric in a way; trying to cover most of the available technologies. In the first generation of broadband policies in early 2000's, one can see the same trend where 128kbps was the lower limit just to include copper-wire and EDGE but gradually the technology advancement made it possible for governments to have upward revision of broadband. Now mostly broadband definitions are around 2mbps or upward.

For regulators, it is time to delink the definition of broadband from technologies and focus more on the applications and media used by consumers. According to Cisco's Visual Network Index¹⁴, two-thirds of internet traffic is video, and that is rising. With lot of video, broadband becomes more media-centric, which means pushing a lot of consistent traffic – unlike web-centric environment. “With video you need a lot of bandwidth for every user”¹⁵.

On top of broadband, what really is a mobile broadband is a task, currently FCC¹⁶ is in the process of defining¹⁷.

2.13 Predictability

Shock and awe policies are counter-productive for businesses especially where sunk costs are involved. It is extremely important for both new entrant and existing operators to be able to predict, how the

¹⁴ http://www.cisco.com/en/US/netsol/ns827/networking_solutions_sub_solution.html

¹⁵ http://www.telecomasia.net/content/big-opportunities-horizon?section=TOP+STORIES&utm_source=silverpop&utm_medium=newsletter&utm_content=&utm_campaign=telecomasia

¹⁶ Federal Communications Commission

¹⁷ <http://www.androidauthority.com/fcc-test-define-mobile-broadband-112907/>

regulatory regime will grow or evolve in next few years. If this kind of visibility is not there then it would be very difficult for anyone to make a good investment decision. The operators need assurance that terms and condition of their licenses will not be adversely changed without their consent. This assurance better be given through legislation and not just a political promise.

In order to ensure predictability, rules of the game should be very clear and the same for all players. The Regulator should draw a long term plan for the sector and a clear direction after wider consultation. In the absence of a long term plan and clear policy direction, it would be difficult to conceive how the market should behave and may lead to undesirable results like market failure.

Public consultation or at least with the sector is also important because it reduces the chances of wrong policies or regulations, which are difficult to handle by the industry players or may be harsh and burdensome. Public consultations also increase the chances of acceptability of the outcome as everyone who is consulted is more likely to own the outcome.

2.14 Roll-out Obligations

Roll-out obligations, whether in licenses or in regulations should be same for everyone having similar license. Regulators might like to have the roll-out obligations in the regulations as it provide flexibility to revise and improve, whereas operators might like to have these obligations, if at all, in the licenses as changing a license would require their consent, which element is missing in case of change in regulations. For changing regulations consultation may be mandatory but not consent.

There are two schools of thought on extending coverage of broadband: one believes that no roll-out obligation is necessary as demand and competition will take care of it, other does not entirely believe in it and suggests if you need to spread the benefits of modern telecommunication to every knock and corner of the country, roll-out obligations should be there.

We have yet to see some examples in broadband, but mobile phones do have such examples. In Bangladesh in the absence of roll-out obligations mobile phone reached 98% of the population in 15 years, whereas in Pakistan, over five times bigger than Bangladesh in territory, with roll-out obligations in the licenses issued in 2004, mobile reached over 85% of the population in less than three years.

Country's priorities would determine the path it would follow out of the two options but one fact remains, in the first option, uneconomical areas may be left un-served forever but may be served in the second option.

2.15 More shared access points

Prices of smartphones and computers are gradually coming down and initiatives like One Laptop per Child (OLPC)¹⁸ and Indian Aakash¹⁹ [costs \$ 35] has helped more people to access high-speed internet, but for broadband to achieve the level of penetration of mobile phones or meet the targets set by the Broadband Commission for Digital Development²⁰, there still seems to be a long way to go.

This gap can be effectively reduced by providing more shared access such as Community Information Centers, Broadband Centers, Education Centers in schools etc. especially in rural areas. This can be achieved through direct subsidy by governments, subsidies from Universal Access Funds, obligating licensed operators or a combination of these. Establishing shared access points is a key factor in achieving universal access, therefore could be part of roll-out obligations.

2.16 Infrastructure sharing

At the initial stages, sharing of "essential facilities" was encouraged and in case of incumbent mandated as a pre-condition for liberalization to promote competition. This facilitation of open access to the incumbents' network was a big factor in the success of deregulation or liberalization.

Now operators are sharing passive infrastructure for a different reason: to reduce costs and make money out of spare excess capacity. Irrespective of the reason of sharing, it has proved to be beneficial for all parties. Owner of infrastructure sells excess capacity which otherwise would remain unutilized, lessee of the infrastructure reduces capital costs and saving of both is passed on to the consumers. This has made operators efficient enough to compete in the retail market.

The challenge ICT sector is set to overcome is broadband and similar open access is the fastest path to build the information super highways. The open access regulations and/or license obligations should be based on similar principles as were in RIO²¹; transparency, non-discrimination, unbundling of network

¹⁸ <http://one.laptop.org/>

¹⁹ [http://en.wikipedia.org/wiki/Aakash_\(tablet\)](http://en.wikipedia.org/wiki/Aakash_(tablet))

²⁰ http://www.broadbandcommission.org/Documents/Broadband_Targets.pdf

²¹ Reference Interconnection Offer

elements and co-location and wholesale price controls in case parties cannot agree on commercial arrangements. National Broadband Plan in Brazil creates opportunities for operators to provide services over the state-owned broadband network.

2.17 Allowing vertical separation

In India another model emerged, where tower companies were created by separating the function from the parent mobile cellular companies and selling space on masts to parent and parent's competitor companies.

Airtel²² of India moved a step further by outsourcing entire network operations to its vendors²³. This model made the company to reduce its costs significantly. Another player in the Pacific and Caribbean, Digicel²⁴ also reduced its costs significantly by centralizing its operations. These models have proved successful and regulators should permit these arrangements.

2.18 Universal Access and Service Funds

In addition to the roll-out obligations, there could be a license obligation to contribute towards Universal Access and Service Funds.

There is growing consensus that mobile phone operators have covered major parts of the countries and there is no need to spend Universal Access and Service (UAS) Funds other than giving individual subsidy to use phone. Although there is enough evidence to show that people at BOP²⁵ has come up with innovative solutions to the affordability problem by having multiple SIMs, giving missed call, operators have also responded to the need by introducing on-net RPP²⁶.

Affordability of broadband services is a major hurdle in its penetration. Although ITU data show that prices for ICT services are decreasing, prices for broadband services remain very high in many developing countries. This is particularly the case in Africa, where fixed broadband Internet access costs on average almost three times the monthly average per capita income²⁷.

²² <http://www.airtel.com/>

²³ <http://trak.in/tags/business/2010/09/20/bharti-airtel-outsourcing-africa-business/>

²⁴ <http://www.digicelgroup.com/>

²⁵ Teleuse@BOP3: A Qualitative Study by LIRNEasia

²⁶ Receiving party pay

²⁷ ITU Measuring the Information Society 2011 report

UAS funds, with a few exceptions, do not have a good track record of helping network expansion. However if one is existing in the country, funds must be used for modern services including broadband instead of basic or mobile telephony.

Priority areas for UAS funding could be to lay optic fiber, build passive infrastructure, and allowing shared broadband access. Funds can also be used to create demand, like giving broadband connections to schools, hospitals, community center etc.

2.19 Consumer protection

Consumers are direct stakeholders of a Regulator, who is bound to protect their interest. This role has increased in broadband environment. Regulators may develop or encourage operators to prepare customers charters.

World over, broadband service providers advertise broadband speed that is often higher than actually experienced by the user. A report from the United Kingdom's Ofcom found that only 20 percent of customers live close enough to a telephone exchange (3.2 kilometers) to receive 8 Mbit/s from an advertised 8 Mbit/s connection. This issue has emerged and some governments have begun to respond. The Czech government has asked that service providers offer actual achieved speed that is, over the long term, not less than 80 percent of the advertised speed²⁸. In its recommendations to member countries, the OECD advises²⁹, Governments should discourage harmful business conduct and practices such as misleading advertising.

Regulators need to create awareness about broadband services and packages. Transparency in the billing needs to be ensured and licensees should be bound to have honest advertisements or at least it should not be misleading. Samoa recently determined against 4G advertisements of one of the licensee³⁰. LIRNEasia has also recently conducted a broadband quality survey³¹ in the Pacific showing the advertised and delivered speed by the operators.

²⁸ Building broadband: Strategies and policies for the Developing World by Yongsoo Kim, Tim Kelly, and Siddhartha Raja

²⁹ Broadband Growth and Policies in OECD Countries, 2008

³⁰ <http://samoaregulator.jigsy.com/files/documents/Press-Release-from-OOTR.pdf>

³¹ <http://lirneasia.net/2012/07/diagnosing-broadband-quality-in-the-pacific/>