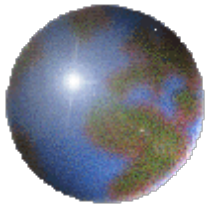

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Session 2.2

Developing Incentives to Increase and Expand Broadband

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IP3 Next Generation Issues for Telecom Regulation
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AGENDA

- Importance of Broadband
- Impact of Broadband and ICT on the Economy
- Policy Tools to Stimulate Broadband Access
- Discussion of the Available Instruments and Mechanisms to Stimulate Broadband Access
- Conclusions

Overview: Impact of Broadband

- According to the World Bank, a 10% increase in mobile telephony penetration could increase economic growth by 0.81% in developing countries, whereas a 10% increase in broadband penetration could increase economic growth by 1.4%
- Broadband has been proven to impact growth & productivity
- At low levels of broadband penetration, the impact of broadband on the economy is minimal due to the "critical mass" concept.
  - According to this theory, the impact is maximized once the infrastructure reaches a critical mass point.
  - However, research shows that to achieve a material level of economic impact, broadband must reach high levels of penetration

Importance of Broadband to Economy

- For countries with low broadband penetration rates (under 20%), an increase of 1% in broadband adoption contributes to 0.008% of GDP growth, while in countries with medium penetration rates (between 20 – 30%), the effect is 0.014% of GDP growth, and in countries with penetration rates higher than 30%, the impact of an increase of 1% in broadband adoption reaches 0.023%.
- An enabling regulatory framework that takes advantage of new technologies and business models will increase penetration and broaden the range of services, without tapping on public monies other than those required to maintain a regulatory agency

Importance of Digital Literacy

- The underlying assumption is that by reducing the obstacles for infrastructure investment, the digital divide challenge would disappear.
- Yet, while supply-side issues such as the gap in investment contribute heavily to the digital divide, digital literacy and demand for broadband services play a key role in explaining service penetration.
- A significant portion of the population does not subscribe to broadband Internet for reasons beyond service availability and affordability
  - Lack of digital literacy or limited interest.
  - An understanding of this problem and its causes is critical to put in place an appropriate set of policy tools for promoting broadband.

Why ICT Adoption Rate is Low

- ICT adoption is not only marred by undeveloped broadband networks, but also by a lack of incentives, e.g., many governments of emerging countries have failed to enact laws that promote ICT adoption such as tax incentives, subsidies for remote telecommunications, and so forth.
- Primary reasons for the low level of broadband uptake among SMEs are:
  - Limited access to investment capital;
  - Comparatively high technology costs;
  - Lack of training;
  - Cultural/educational factors
  - Difficulty in access to and retention of skilled ICT workers
- Source: GSR 2010 Discussion Paper: The impact of Broadband on the Economy, Raul Katz

Impact on Employment & Infrastructure

- Broadband network construction affects employment in three ways.
  - First, network construction creates direct jobs necessary for the building of the facility such as telecommunication technicians, construction workers, and manufacturers of the required telecommunication equipment.
  - Second, the creation of direct jobs has an impact on indirect employment; indirect employment includes jobs related to upstream buying and selling between metal and electrical equipment manufacturing sectors, for example.
  - Third, the household spending based on the income generated from the direct and indirect jobs creates induced employment

Policy Tools Available

- The policy tools required to stimulate the deployment of broadband range from:
  - Development of national broadband plans,
  - Universal Access mechanisms to eliminate the access gap
  - Enactment of competition policies
  - Identification of cases where the government should intervene in order to address specific market failure
- Broadband plans stipulate targets to be achieved in terms of deployment, adoption, and quality of service

Policy Tools (Continued)

- Investing in promotion of adoption programs is primarily oriented at addressing demand gaps by means of
  - universal service policies;
  - the stimulation of the adoption of broadband through digital literacy;
  - economic subsidies;
  - deployment of public access centers;
  - development of eGovernment applications to promote adoption of broadband.
- Adopting a competition policy: as competition among service suppliers is an excellent way to stimulate broadband supply
- Removal of any potential supply obstacles since competition among service suppliers is the right model to stimulate broadband supply

Policy Tools

- The government can play an important role by creating incentives for companies to serve areas that they would not be willing to serve and thereby address the access gap
  - It can make a private sector business case sustainable by putting in place several mechanisms to reach critical mass making entering the market a worthwhile venture for providers.
  - Adding its own demand to the market, or indirectly subsidizing subscribers to make prices more affordable
  - It can provide grants to fund capital investments or reducing the costs of obtaining rights of way and/or spectrum access
- On the other side, it is private companies who have a better understanding and react effectively to changing conditions in the market.

Making the Case For Broadband

- Regulators and policymakers can make the case for broadband and ICTs by using Universal Access initiatives and by engaging in possible public-private initiatives, where necessary, to finance infrastructure.
- Making the case for broadband and ICTs involves
  - Stimulating demand for ICT services by adopting policies directed at making ICTs affordable for large parts of the population (e.g., low-cost PCs, reduced taxation of ICT equipment and services) and
  - Promoting the creation of relevant and compelling content (e.g., developing digital literacy programs, e-government, e-health, and e-learning initiatives).

Universal Access

- First Generation Definition of Universal Access (Service)
  - Universal Service refers to all households in a country having a telephone, so that all individuals can make a telephone call from home.
  - Universal Access as all individuals having reasonable access to a telephone that they can use within a reasonable distance and at a reasonable cost. This could either be in their own home, at a business, or some public facility. It is seen as an interim step.
- Universal Service and Universal Access measure different things, and require different policy measures.
  - Absolute Universal Access is achieved when 100% of the population has access to a given service.
  - Absolute Universal service is achieved when a given telecom service is affordable to 100% of individuals or households

UAS Concepts

Issue	Basic meaning	Differentiation
Availability	Coverage of inhabited geographic territory	• Region /area • Locality size
Accessibility	All inhabitants can use	• Gender • Race, tribe, religion • Ability /disability
Affordability	Ability to pay	• Access device (Handset, PC, subscription costs) • Cost of calls & services • Minimum "basket" below a certain national limit (e.g., 3% of family income)

The increasing focus on the Internet and broadband leads to the adding of two new categories, ***awareness*** and ***ability.*** Awareness of services and benefits & ability to use computers, navigate the Internet & use ICT services

UAS Measurement

- Need to find better ways of measuring success of UA programs moving away from coverage to usage and quality of service
- The question then becomes are people able to use the broadband access they have? And does minimal access count towards meeting UAS goals?
- Is Broadband defined differently in urban areas as opposed to rural areas?
  - What are the allowed contention ratios?
- UAS goals will continue to rise with technology & service development – towards e-Inclusion
- Focus shifts away from simple access to:
  - Bandwidth/speed, ICT capacity/ability, Applications/services

Key UA Study Findings (continued)

- Successful UA programs and funds are characterized by:
  - Clearly defined objectives, strategies/plans derived from public consultation with all stakeholders, taking into account the national ICT agenda;
  - Clear and unambiguous legal and regulatory framework
  - Well defined role of the regulator and administrator of universal access fund programs;
  - Clearly defined and transparent process and procedures for requesting and obtaining subsidies;
  - Strong and continued political and administrative support
  - An environment that facilitates & actively promotes the deployment of new services & technologies;

Key UA Study Findings (continued)

- Clearly defined funding obligations with some flexibility for changing circumstances;
- Strong and effective leadership at both the policy and implementation levels and a high degree of autonomy for the fund administrator;
- Transparent and participative process of identifying projects and awarding of subsidies

Mechanisms to Promote UA

- Several recent World Bank studies highlighted innovative mechanisms and incentives for Regulators to use to promote broadband and close the access gap. Some of these are:
  - Increase Flexibility of Spectrum rights, licensing, and authorizations
    - Create a special Rural Specific license where interconnection rate, charges and other access and costing issues are priced differently.
    - Implement a simple competitive licensing regime
    - Remove burdensome restrictions or prohibitions on IP based networks and applications.
    - Promote and facilitate sharing of infrastructure and facilities. Examples, Brazil, India, Dominican Republic
  - Licensing of local entrepreneurs to run programs or telecenters, Uganda, Kenya, Sri Lanka, India, Brazil, and Dominican Republic.

Mechanisms (continued)

- Government can act as an anchor user to guarantee revenues during the ramp-up phase of broadband installation.
- Local governments can proactively coordinate demand for broadband access from public administration, public safety, local schools, and health care facilities to create an "anchor tenant".
- The government then negotiates a wholesale rate and long-term contract with a broadband service provider to ease the initial economic pressure and reduces investment risk.
- The government can also stimulate demand from the private sector by working at the grass-roots level

Mechanisms (continued)

- In certain cases subscriber subsides can reduce backhaul costs, infrastructure sharing (e.g., backbone &towers) and should be allowed and encouraged.
  - Infrastructure sharing alleviates cost pressures on competing providers.
  - Regulators may reduce right of way or access costs (e.g. spectrum costs or pole attachment fees).
  - They may also attempt to regulate backhaul costs by providing grants for capital investment
- In a last resort, governments can act as a risk taker & can auction the right to operate the broadband infrastructure to highest qualified operator

Mechanisms & Instruments

- In rural areas, spectrum has become a costly entry barrier for small operators oriented towards low-income segments.
- Many countries have spectrum allocation policies that grant nationwide licenses, not bearing in mind that license holders are usually going to concentrate their operations in urban areas.
- Opportunity cost of spectrum in rural and low-income areas is different
- Need to have several different approaches between rural and urban areas when dealing with frequency allocation.
- One way is to allow for the secondary use of GSM spectrum for the provision of fixed wireless services.

Mechanisms & Instruments

- This Mechanism creates an opportunity for small local companies to provide fixed wireless services over mobile networks in secondary locations.
- Lower costs in spectrum, network, and handsets would allow these companies to provide services to low-income segments, and local on-net calls would help sustain their operations
- Brazil and the Dominican Republic have used this mechanism successfully
  - By having a more flexible approach towards spectrum management in rural areas, the Brazilian Government eliminated a costly barrier for the emergence of companies oriented towards low-income segments in secondary urban and rural areas.

Mechanisms & Instruments

- Many universal service funds around the world use reverse auctions under OBA guidelines, where basically a set of desired services (outcomes) are previously designed and requested in an open tender, and subsidies are awarded to the operator that demands the lowest subsidy
- An alternative sets a fast track approach by providing capped subsidies per location to be given to companies that are willing to serve rural towns that fit certain criteria
- This avoids the cumbersome tender process and channels resources in a more expeditious way
- This mechanism allows local entrepreneurs to propose complementary projects at a community level and creates opportunities for projects that leverage specific characteristics from individual communities

Universal Access Instruments

Aimed at promoting efficient markets (close the market gap)

Mechanism	Specific obstacle addressed	Description
Asymmetric interconnection	Operation costs in rural areas are higher than in urban areas	Higher termination rates for rural networks are set depending on cost estimations
Facilities sharing	High investment costs in challenging environments	From passive infrastructure to open access, operators are obliged to share their assets with entrants at a "fair" rate
Flexible use of spectrum in rural areas	Operators focus their operations in urban areas and allocated frequencies are not being used in rural areas	Allows rural operators to use available spectrum in commercial frequencies for better and profitable coverage
Introducing licenses for rural local operators	Operators focus their operations in urban small-scale operations and do not develop tailor-made solutions for rural areas. On-net revenues	Local entrepreneurs are allowed to create small-scale operations. On-net revenues improve the business case
Elimination of sector specific taxes and duties	Sector-specific levies introduced that represent an unnecessary burden to operators: Tax Policy/spectrum charges/ annual license fee	Evidence suggests that reducing sector specific taxes and duties increase on GDP growth

Universal Access Instruments

Aimed at reducing the access gap		
Reverse auctions (award) + Output-Based Aid (disbursement)	Though sustainable in the medium term, some projects are not initially attractive to investors.	*Reverse auctions*: Award projects to operator that will deliver required services for the lowest subsidy. *Output-Based Aid*: Disbursement schedule tied to delivery of "outputs" rather than infrastructure
Introduce bottom-up projects for universal access	National operators usually don't design projects/products addressed for low income rural areas	Allow for community-based initiatives to be financed
Institutional demand stimulation	Low demand in rural areas reduce attractiveness of supply	Create "captive" demand for service in rural and low-income areas by committing government agencies to pay for these services. Could imply cost-reduction for the government, but requires high level of coordination between sector ministries
License obligations	Lack of interest of entrants established in main cities to rollout nationwide	Include mandatory areas for coverage as part of the licenses of new players
End-user subsidies	Low-income and rural households are unable to afford telecommunications services	Target population is given a subsidy that allows them to pay for services
Designated universal service operator	Reaching high costs areas is a disadvantage for incumbents when facing aggressive competition in densely populated/low cost areas	An operator, usually the incumbent in countries with preexisting national coverage of fixed networks, is given the task of fulfilling the universal service strategy of the country. In return, they receive a per-connection transfer from the government
ADC (Access Deficit C		Incumbent operators are allowed to receive a compensation for every

Financial Support Mechanisms

Financial Support Mechanisms	Mechanism Brief description
Internal cross-subsidies	Network expansion and service delivery is financed through mark-ups on high-return services and low-cost users
General government budget	Budget is allocated annually to universal access/service programs
Interconnection surcharges	A mark-up on interconnection charges is used to finance service expansion in rural and low-income areas
Operator contributions into a universal service fund (USF)	Operators contribute to a fund that is then used to finance universal access/service projects
Virtual USF	Similar to a USF but the monies are never transferred to a fund and are instead kept by operators
Pay or play	Operators are given the chance of providing services in rural and low-income areas instead of contributing to a USF

Source: Kunigami & Navas-Sabater, World Bank Working Paper #178

Mechanisms & Instruments: Examples

- In 2007 the Dominican Republic, Indotel, the regulator, launched a rural broadband tender aimed at installing broadband connections for 500 communities under an output-based aid (OBA) scheme
  - Additionally community groups partnered with Government to set up computer labs in schools to train students and also to incorporate computer literacy into all aspects of school curricula. Computer labs were open to the general public after hours.
- In DR as well as in Sri Lanka, local entrepreneurs & other community groups competed for bids to run, manage & develop the Rural Telecenters. These mechanisms allow local entrepreneurs already operating telecenters to work as local ISPs within their communities, to offer broadband Internet access and VoIP phone services.
  - The main benefit of this approach is that it gives local entrepreneurs to ability to serve their communities with tailor-made solutions in a self sustainable manner, leveraging low-cost technical solutions & minimizing public funds requirements.

Mechanisms to Promote Universal Access

- Creating Institutional Demand
  - Have broadband infrastructure connect Government offices, Health centers, Schools, etc..
  - Have Government guarantee a certain amount of revenue from applications or services
- Open Access to Infrastructure Sharing
  - Open Access is about creating competition in all layers of the network allowing a wide variety of physical networks & applications to interact in an open architecture.
  - Allows anyone to connect to anyone in a technology-neutral framework to encourage innovative and low-cost delivery, including alternative infrastructure carriers run by national utility companies
  - Have clear rules for third-party access
  - Encourage market entry from smaller, local companies
  - Promote passive and active sharing of infrastructure

Mechanisms & Instruments

- Governments also can offer a guaranteed revenue stream for the project to reduce the investment risk and help sustain operations
- Basically, this mechanism leverages governments' purchasing power as an anchor tenant.
- Institutional demand also helps create private demand for services.
  - Nicaragua is currently designing a national tender to provide broadband access to about 100 municipalities that do not have affordable Internet connections.
  - Points of presence will be housed in municipalities and access to the public will be allowed
- This mechanism can reduce both public transfers to universal access programs and overall government expense on communications, but it is critical in these schemes to involve local authorities from the start.

Open Access to Infrastructure / Bottom up Financing

- This type of mechanism requires transparency & needs to be based on clear and comparative information on market prices and services.
- An Open Access business model requires trust in parties.
  - The service provider needs to feel that the infrastructure provider is going to tackle his/her needs with same degree of attention as if the organization was doing it itself.
  - That pricing needs to be transparent and nondiscriminatory.
  - If the incumbent operator is the only infrastructure provider, need to separate out the transport services from the access services to create trust.
- The last mechanism is to allow pipeline for financing projects from the bottom up instead of the top down, ie, have operators suggest pilots to be funded rather than having them suggested by Government.

Conclusions

- Need to ensure that the country has a regulatory framework that can take advantage of new technologies and business models designed to increase penetration and broaden the range of services
  - Adopt a competition policy: as competition among service suppliers is an excellent way to stimulate broadband supply
  - Ensure that any potential supply obstacles are removed since competition among service suppliers is the right model to stimulate broadband supply
- ICT adoption is marred not only by undeveloped broadband networks, but also by a lack of incentives, e.g., many governments of have failed to enact laws that promote ICT adoption such as tax incentives, subsidies for remote telecommunications

Conclusions

- Government plays a key role in addressing the access gap by creating incentives for companies to serve areas that they would not be willing to serve.
- On the other side, it is private companies who have a better understanding and react effectively to changing conditions in the market.
- Stimulate development and allow for innovative use of new wireless technologies that provide Internet access in rural and low-income areas.
- Create Institutional Demand and have Government's act as Anchor tenants in Private Sector Broadband projects

Conclusions

- The policy tools required to stimulate the deployment of broadband range from:
  - Development of national broadband plans,
  - Universal Access mechanisms to eliminate the access gap
  - Enactment of competition policies
  - Identification of cases where the government should intervene to address specific market failure

Questions, Comments, Suggestions?

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Thank You