

Overcoming the Digital Divide in broadband access: Regulatory Innovation

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Presentation of Content

1. Broadband coverage and Economic Development.
2. Competition among Vertically Integrated network and value added operators deepens the digital Divide
3. New Option: Fiber to the Corner with LTE Mobile Technology for last mile and vertical segmentation.
4. Necessary reform for democratization of Broadband coverage.
5. A Case Study: Low Income areas of West Santiago
6. Conclusions

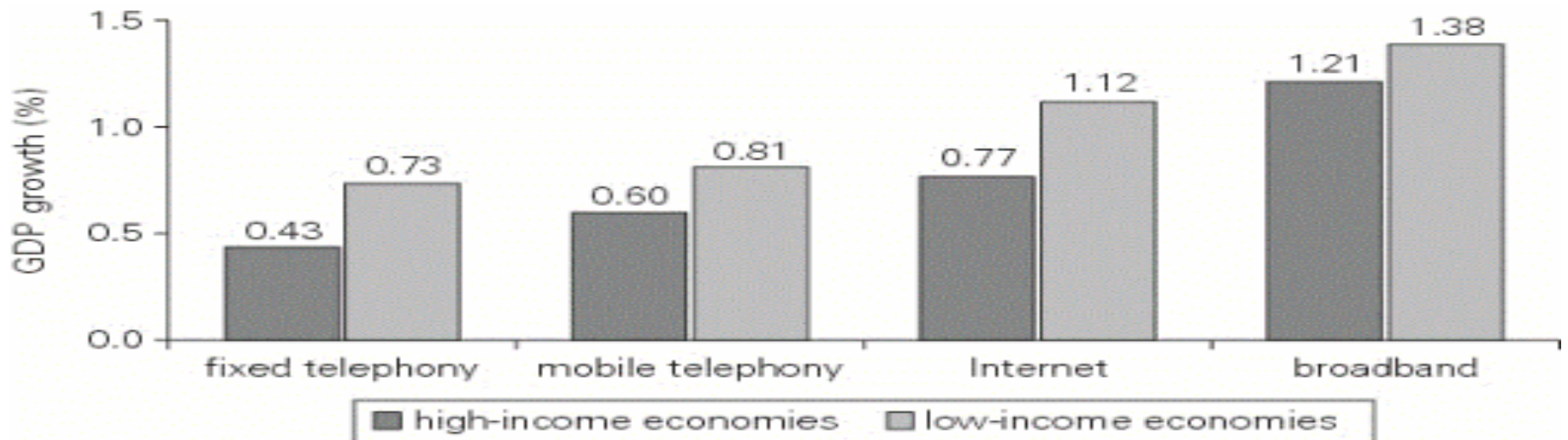
1. Effects of Increasing Broadband Coverage on development

- Broadband has significant impacts in a country's economic output and GDP.
 - 1) enhancing the role of human capital through easier acquisition of knowledge and technical skills;
 - 2) improving the efficiency and productivity of enterprises, i.e. Supply Chain Management, Cloud computing: instant access to data and business applications;
 - 3) increasing competition in markets with information asymmetries
 - 4) by attracting knowledge-based businesses by sparking new and innovative technologies, services, applications and business models.

Economic Impacts of Broadband, GICT Dept. World Bank 2009
- Expanding BB coverage by itself it is not enough. Demand and use has to be stimulated. How?
 - Connect all schools with high speed broadband. Develop educational content for the educational community.
 - Digitalize health services solving lack of specialist with remote services.
 - Develop G-Cloud and interoperability in government.
 - Promote technical assistance to Micro Small business for promoting the use of digital technology for business processes.
 - E- procurement and the maximum level of government services on line.

1. Leapfrogging Stages of Technologies Development in Less Developed countries

- The possibility of jumping over generations of Technologies having drastic impact in productivity and living conditions.
- Cellular and satellite Telecommunication allow many regions to avoid deployment of more expensive land telecommunication services.
- Higher Potential impact of BB in Growth in developing Countries



1. Leapfrogging Stages of Technologies Development in Less Developed countries

		2005	2012	
Fixed-telephone subscriptions per 100 inhabitants				
Developed World		47,2	42,7	
Developing World	Ratio 4	11,7	11,3	Ratio 4
Papua New Guinea	Ratio 40	1,05	1,96	Ratio 22
Mobile-cellular subscriptions				
Developed World		82,1	123	
Developing World	Ratio 3,6	22,9	89,4	Ratio 1,3
Papua New Guinea	Ratio 82	1	37,8	Ratio 3,2
Broadband Subscriptions				
Developed World		12	101	
Developing World	Ratio 12	1	25	Ratio 4
Papua New Guinea	Ratio 82	0	0,1	Ratio 1000

Successful leapfrogging with cellular technology for voice and basic internet. But it is not happening with Broadband with Bandwidth required for most valued applications

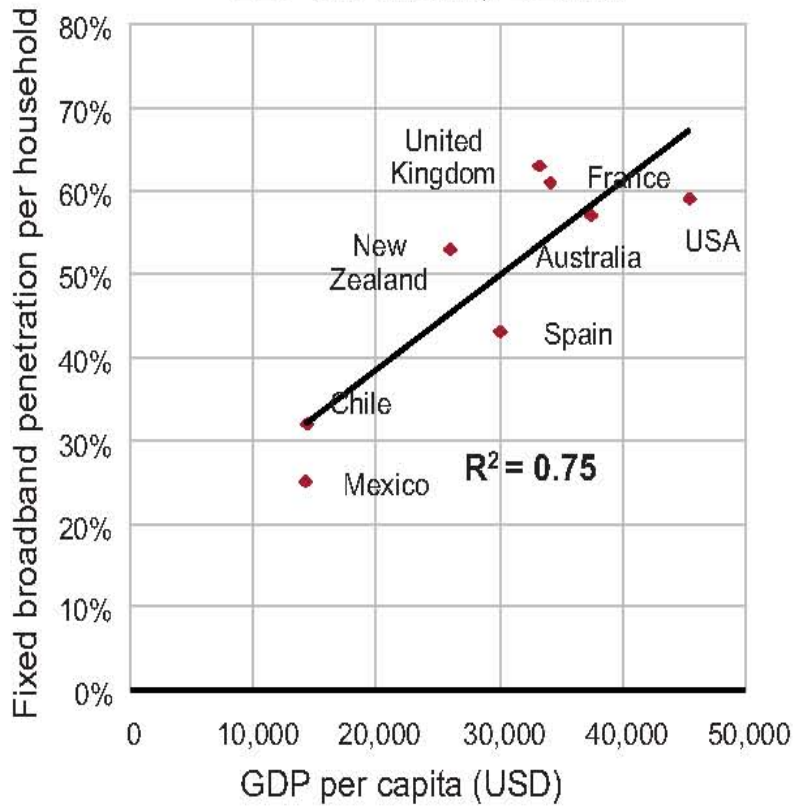
Leapfrogging may be attractive for late adopters, but in many cases transferring the same technology with the existing market organization not always will bring the intended results.

2. LAC: Market Organization Models for BB Services result in Digital Divide

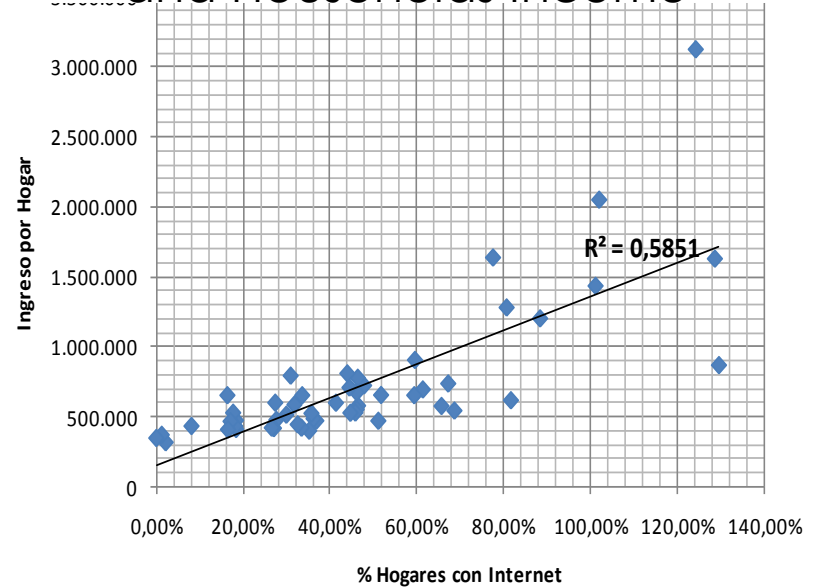
- In LAC delivery of services by vertically-integrated operators that manage their own networks, with economies of scale, scope and network externalities and huge sunk costs.
- This model generates barriers to entry, tend to cream skim the market, discourage investment to supply high bandwidth services to low and middle income households and Small business, deepening the digital divide.
- Forcing unbundling or regulated resale, does not solve the lack of incentives for investing infrastructure in areas of medium- low density and income. It becomes a risky undertaking, and companies only provide wireless technology which will not be adequate to develop bandwidth required for mobile broadband services and applications.
- The dynamics of vertically integrated oligopolies, will lead to over investment in infrastructure and high prices in dense areas with clients with high willingness to pay on the one hand, and very limited infrastructure in the rest of the city with very poor quality and price quality ratio on the other hand.

The digital Divide

Fixed broadband penetration versus GDP per capita (1Q 2009)⁽¹⁾

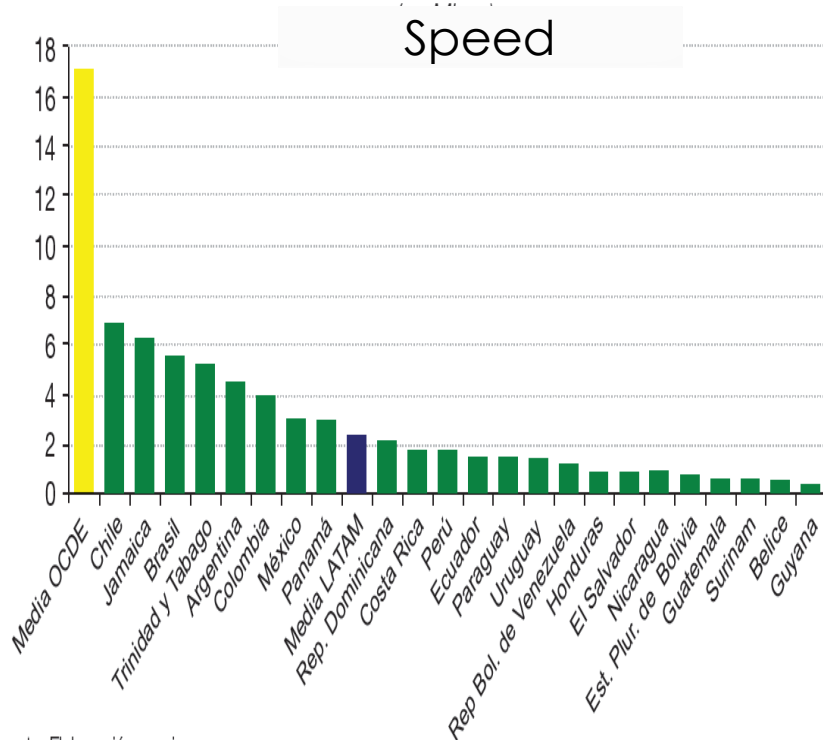


Santiago Chile: BB Penetration and Households Income



Digital Divide: Broad Band Latin America versus OECD

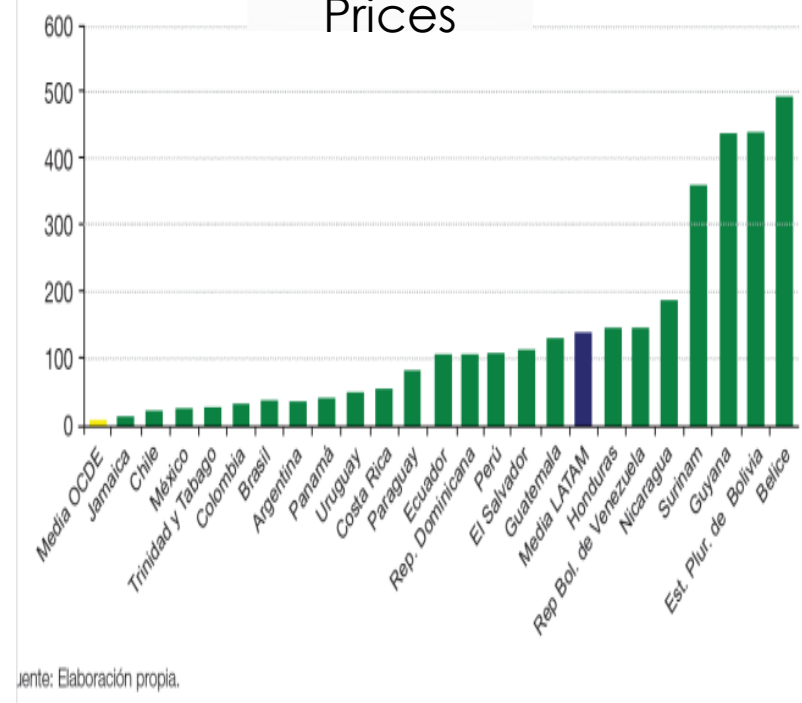
Gráfico V.3
Velocidad promedio ofrecida



Fuente: Elaboración propia.

Speed: 6:1 OECD:LAC

Gráfico V.6
Tarifas de banda ancha
(En dólares PPP/Mbps)



Fuente: Elaboración propia.

Prices: 24:1 LAC/OECD

3. Fiver to The Corner with a Common Infrastructure and Competition in the Last Mile

- Some developed countries that have decided to promote high speed broad band have invested Fiber to the Home (FTTF), at a cost of US\$ 2000 per connection which is prohibited for developing countries.
- The proposal consider Fiber to the Corner FTC with LTE mobile technology, complemented with a back bone of optic fiber that should be distributed in the city allowing connecting nodes(POP), where all clients to be served should be in a maximum radio of one kilometer for providing high quality service at low cost.
- In some simulations of low density neighborhood with Fiber to the Corner we will see that with a maximum distance of 700 mts to the Pint of Presence the cost per home is approximately US\$ 300 15% of the cost of the FTTH solution.
- The separation of infrastructure services would allow structuring a long term concession scheme, creating competition for the field, instead of face to face competition, in a natural monopoly service.
- This model would lower the economic cost of infrastructure investment, maintaining competition in the last mile service.

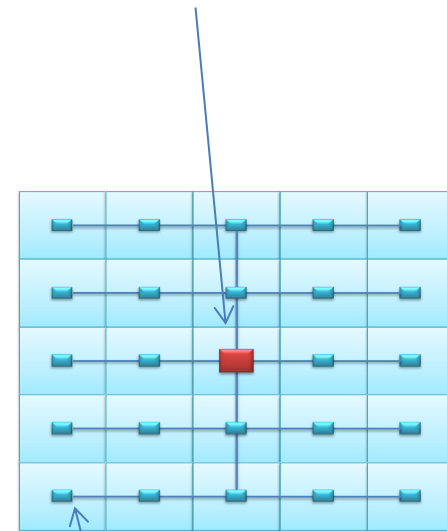
3. Problem of political economy: There are companies that have made significant investment in infrastructure in the integrated model of competition between firms.

- Solution: It is necessary to restrict the segmentation model and the development of infrastructure concessions only in areas where there is limited or no supply of fiber optic infrastructure.
- It should aim to develop non integrated infrastructure concessions in communities where there is prevalence of middle –low income households.
- This allows to share all those infrastructure components that have large economies of scale and sunk costs, which is socially efficient, as the competition for the field is effectively promoted through the concession bidding process.
- It is proposed to develop concession projects that will provide fiber optic to the corner(FTTC), instead of the model of other countries FTTH (Fiver to the home) and promote competition for last mile and value added services.

Description of the Infrastructure Operator Model

- The operator of network infrastructure will deploy fiber to POP well distributed.
- The infrastructure operator offers few sites connection to telecommunication operators and multiple distribution nodes (POP) to serve homes and businesses with different technological alternatives. (LTE, FTH, copper)
- It is key that the POP infrastructure allows multiple operators LTE with spectrum.
- Telecom operators inject convergent telecommunication services in the connection points and withdraw services at POP for the deployment of last mile services to its customers.

Incoming connections



POP



4. Necessary Reforms for implementing the Program

- Defining concessions for Intermediate services associated to Infrastructure.
- Structuring a mechanism for calling for bids with the possibility of granting some subsidies targeted to poor areas.
- Ability to condition the granting of intermediate service concessions to not providing public services.
- Reserve of Spectrum for the infrastructure operator for resale purpose only to LTE operators without spectrum.
- This will create a new generation of MVNO, (Mobil Virtual Network operators) where the Network is offered by a pure infrastructure provider that will not compete in end market.

5. Case Study: West Santiago

- It consider an urban area of 23 km², which will be supplied from 24 distribution nodes(POP), connected via optic fiber to an aggregator node, were telcos will inject the service. The maximum distance from home to nearest POP is 700 mts.
- Total Population 351.000 people and 102.000 homes, where 90% are middle-low or low income, with average per capita income of US\$ 3000 per year.
- Current connections to internet reach 30% of households with an average of 2 Mbps. The cost of a duo fixe telephone line and internet access with 2 Mbps is US\$ 50.
- The solution of Fiber to the corner has an investment cost of U.S. \$ 11 million and operating the \$ 1.1 million a year, for the infrastructure.
- Offer 10 Mbps broadband over landline, with coverage estimated from the household survey the coverage double to 60%, with a significant increase in speed. The cost per household of the duo would be US\$ 25, compared with US\$ 62 current price.
- Without government Subsidy the coverage double, reaching 60% in a rather poor area and the speed increase 5 times.
- With a supply subsidy of US\$ 6 per households (25% of the price) per month the price is reduced to US\$ 19 per month, representing the reduces expenditure only 2,5% of the household incomes.

6. Conclusions

- The model of a vertically integrated oligopolistic telecom operators as is the situation in most Latin American Countries generate high cost, low quality and significant digital divide.
- The model of segmentation with pure infrastructure operators make feasible to deploy optic fiber and expand coverage at lower cost than the vertically integrated oligopoly.
- For Developing Countries the combination of Fiber to the Corner with well distributed POP is a cost efficient solution, for levels of bandwidth of 10-20 Mbps.
- With this speed most valuable applications become reachable, allowing the expansion of demand.
- With competition for the field for the infrastructure concession, it is possible to introduce targeted competitive supply subsidies in an efficient way reducing the cost to end users in poor areas.
- For unleashing inclusive innovation complementary measures are required to stimulate the demand for the services.