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Prices and quality of broadband in Latin America: Benchmarking and trends

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Executive Summary

After several years of growing at rates close to 50%, the fixed broadband market in Latin America is beginning to show signs of slowdown, as a result of saturation levels in higher-income urban areas and low adoption among medium and low-income households. Expanding the boundaries of the fixed broadband market towards these households represents one of the main challenges for telecommunications policy in the region over the coming years.

The results of this paper suggest that, in general, fixed broadband prices in Latin America remain above the thresholds that promote the widespread adoption of the service. In particular, a comparison with developed countries suggests that there is ample room for price reductions and improved service quality. The “typical” broadband plan in Latin America is 66% more expensive than in OECD member countries, while, on average, the price per Mbps of download speed in developed countries is seven times cheaper than in Latin America.

In regards to the service quality offered in the region, the results show a significant improvement over the past two years. The average download speed of the “typical” plan in Latin America doubled from 2010 to 2012, from less than 2 Mbps to almost 4 Mbps. However, the quality of the “typical” plan in OECD member countries also doubled (from 10 Mbps to 20 Mbps) during the same period. As a result, the gap in terms of service quality that separates the two regions remained constant. On average, the quality of service promised in the “typical” broadband plan in the region is five times lower than that in developed countries.

Evidence suggests that there are very diverse situations within Latin America’s broadband markets. While some markets have prices comparable to those in the OECD countries, in the less developed countries of the region prices are five to 35 times higher, depending on the price indicator considered. However, the trend indicates a steady decline in broadband prices, and a very significant decline in some of the less mature markets, which points to a moderate optimism regarding increased adoption in the medium term.

In analyzing the relationship between broadband prices and income, the results indicate that, on average, a household in Latin America must make an effort seven times higher than an OECD household to pay for the “typical” broadband plan available in the respective markets. Bridging this affordability gap represents a major challenge for achieving high penetration of services in the region. Several countries in the region have recognized this challenge, undertaking infrastructure initiatives and regulatory changes to increase competition, and fostering the supply of basic connectivity plans.

Finally, it is essential to review the tax burden on broadband services, which significantly impacts the prices analyzed in this paper. Different studies show that the contribution of broadband to economic and social welfare increases with the level of penetration. Faced with this evidence, current tax policies penalizing broadband adoption entail a reduction in future economic and social benefits for the inhabitants of the region.

1. Introduction

High penetration levels of broadband services are necessary to fulfill the benefits associated with the development of Internet. Several studies show that these benefits are not linear, increasing as the level of penetration grows (e.g., Czernich et al., 2009; Koutrompis, 2009; Katz, 2012). This means that a critical mass of adoption in homes and businesses must be reached in order to maximize the positive impact of the Internet on the productive apparatus and the social fabric.

What is the penetration threshold that activates the network externalities of broadband and maximizes the adoption impact of this new technology? Although the evidence is not yet conclusive, several studies indicate that below a threshold of 20% penetration (measured in subscriptions per 100 inhabitants) the benefits of Internet adoption to economic and social development are significantly reduced (Koutrompis, 2009).

Latin American countries are still far from this threshold. The most recent data from the International Telecommunication Union (for December 2011) shows that the countries in the region with the highest development of broadband (such as Argentina, Chile and Uruguay) have penetration levels just above 10%, while lagging countries are below 2% (the average for the region is 7.7%). Therefore, unless a significant increase in broadband penetration in Latin America is achieved in the coming years, the positive impact of this new technology in the region will be limited.

The delay in broadband adoption in Latin America is due to several factors. Some studies emphasize supply-related factors such as coverage limitations and restrictions on the quality of service offered (Lopez and Hilbert, 2010). Other studies emphasize demand-related factors, such as low capacity for absorbing technology in households and businesses (strongly associated with education levels) and low levels of income per capita (Grazzi and Vergara, 2011).

As shown by Galperin and Ruzzier (2010), broadband penetration in Latin America is below expected levels given the economic endowments and demographic characteristics of the countries in the region. This suggests that regulatory factors are also at play, leading to broadband markets in the region operating below their potential in terms of adoption, coverage and pricing.

This paper focuses on the price level of residential broadband services in the region. Clearly the cost faced by households and microenterprises to contract broadband services is a key factor in explaining connectivity levels in the region. Moreover, the comparison of price levels among countries in the region, and the benchmarking with countries with higher levels of development, are valuable indicators of the competitive performance of national broadband markets.

The analysis is based on a survey of all residential fixed broadband plans offered by leading operators in each country of the region. This original survey was carried out following the methodology outlined by the OECD, which, among other advantages, makes it possible to compare the results with those obtained in OECD member countries.¹ This methodology considers broadband Internet as any Internet access service plan with advertised data download speeds above 256 kbps, and calculates the final monthly price (i.e., with taxes) prorating the first 24 months of service. In each country, the universe of operators considered included at least the largest xDSL access provider and the largest provider of cablemodem service (if any). Overall, 826 broadband plans corresponding to 66 operators in 23 countries were surveyed. Data refer to the capital or main city of each country, and were taken during the second half of June 2012. Following the standard methodology, prices were converted to US dollars using purchasing power parity (PPP) rates in order to obtain comparable measures among the countries considered.

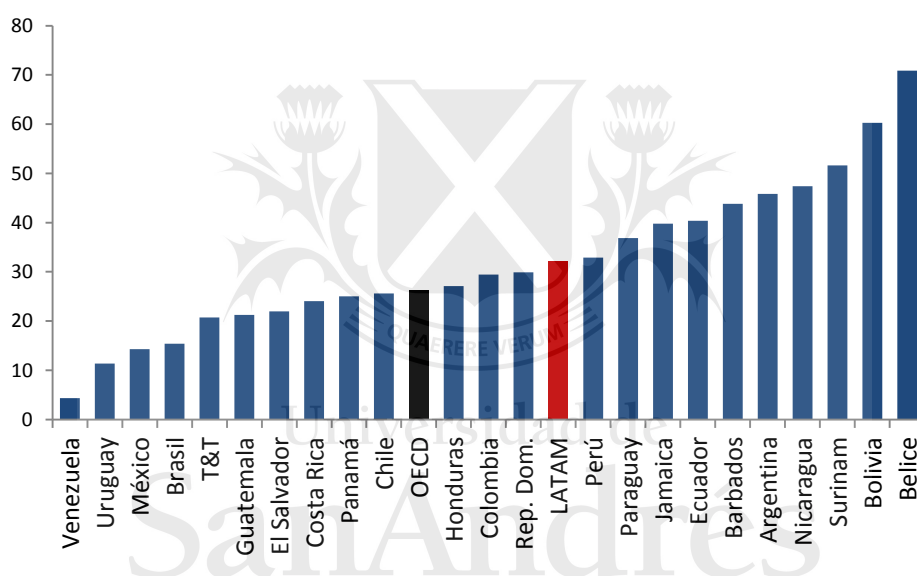
This paper is organized as follows: the next section focuses on the analysis of the price data, while section 3 focuses on the analysis of the advertised speed data. Section 4 combines the pricing data with income data to discuss affordability levels in the region. The final section presents the conclusions and policy recommendations derived from the analysis.

¹ OECD data correspond to September 2011. For information regarding the methodology, see <http://www.OECD.org/sti/ict/broadband>. In this paper, data for Mexico and Chile are included in the LATAM group and have been excluded from the OECD data.

2. Prices for residential access in Latin America

There are several indicators that can be used to compare the price of broadband services across countries. We first consider the least expensive plan available in each market. This indicator is important as it establishes the minimum expenditure a household or small business must meet to obtain fixed broadband service, regardless of its quality and capacity.

Figure 1: Monthly price of the least expensive fixed broadband plan (USD PPP), Q2 2012



Source: author's survey.

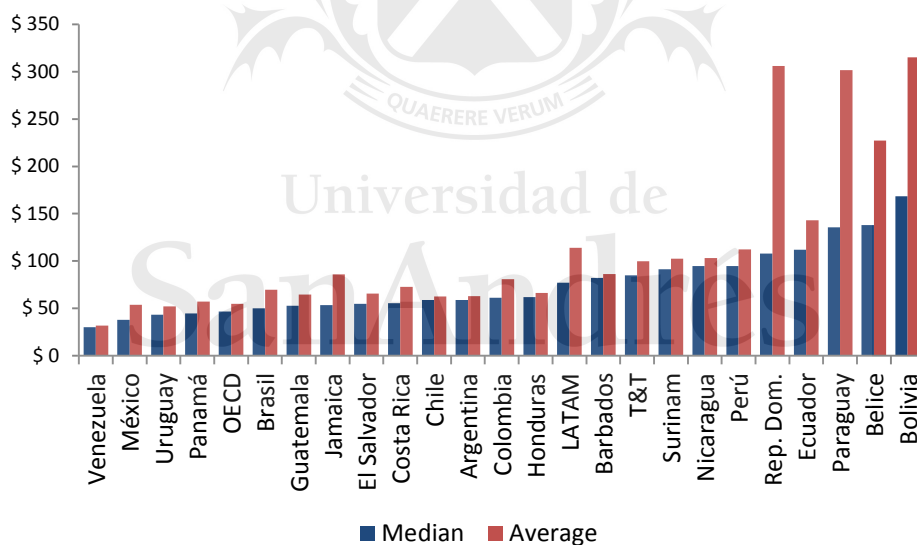
As shown in Figure 1, there is a significant variance in prices of basic connectivity plans in the region. For example, the minimum expenditure that a household must meet in order to access fixed broadband service in La Paz, Bolivia (USD PPP \$60.3) is almost six times higher than a household in Montevideo, Uruguay (USD PPP \$11.4). On average the least expensive plan in Latin America is 22% more costly than in OECD countries (USD PPP \$32.2 in Latin America versus USD PPP \$26.3 in OECD). However, it is worth noting that, regardless of the quality of service offered, in almost half of the countries surveyed there are low-cost plans priced below the OECD average.

This is partly due to the fact that several countries in the region have implemented initiatives designed to meet broadband demand in low-income

households, such as Venezuela (CANTV prepaid plans), Uruguay (*Antel Universal Prepago*), and Brazil (*Internet Popular* in the state of São Paulo). These are plans that typically offer a limited download speed (256kbps to 512kbps) and low data allowances (500Mb to 1Gb per month). In the case of Venezuela and Uruguay, the plans also offer a mixed payment system that combines a small fixed monthly payment with incremental purchases of data beyond the monthly allowance.

For a more general characterization of the level of broadband prices in the region the use of central tendency measures, such as the average and median prices recorded, is needed. These results are reflected in Figure 2. While in most countries both indicators (average and median prices) are almost identical, results for the least developed countries suggest that median prices provide a better characterization of the local broadband market. This indicator can be interpreted as the “typical” plan offered in a given market.

Figure 2: Monthly price of fixed broadband plans (USD PPP), Q2 2012



Source: author's survey.

Again, the evidence reveals significant price variance across countries in the region. For example, the “typical” broadband plan in La Paz, Bolivia is more than five times more expensive than in Caracas, Venezuela. In this case there is also a widening of the price gap between Latin America and more developed countries, since the “typical” broadband plan in Latin America is 66% more expensive than in the OECD countries (USD PPP \$77.14 in LATAM vs. USD PPP \$46.6 in OECD). It is worth

noting that some of the countries with the lowest levels of Internet development are among the most expensive in the region, confirming the link between high prices and low penetration levels identified in numerous studies.²

Another important indicator is the price of a unit of Mbps of download speed implicit in the plans offered by operators in a given market. This indicator is important because it allows standardized comparisons to a single price/service quality unit. The results are presented in Figure 3.

Figure 3: Average monthly price per Mbps of download speed in fixed broadband plans (USD PPP), Q2 2012



Source: author's survey.

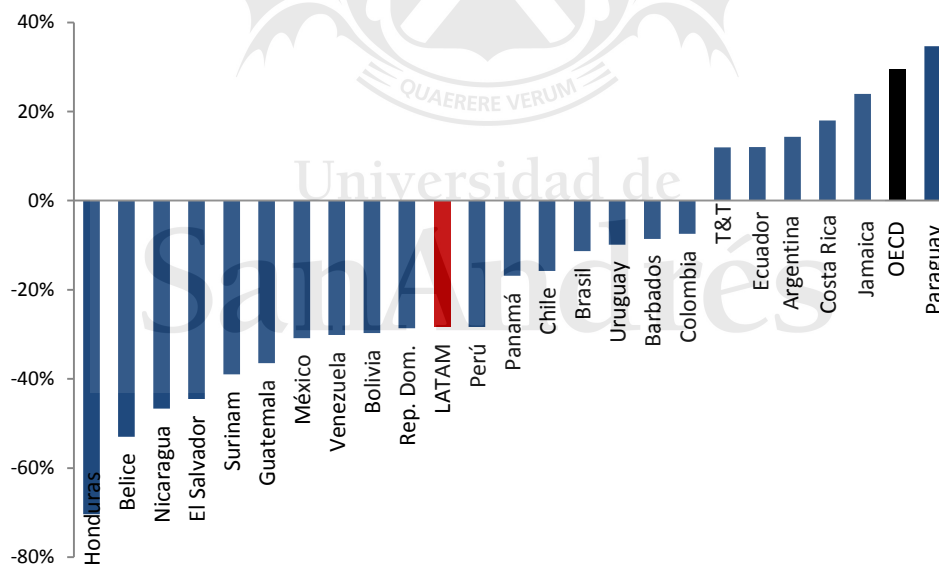
This standardized indicator reveals a much wider gap within Latin America and between LATAM and OECD member countries. For example, buying a Mbps of download speed in La Paz, Bolivia is almost 35 times more expensive than in Mexico City (USD PPP \$269 in La Paz vs. USD PPP \$7.8 in Mexico City). This indicator favors markets with higher speed plans (e.g., above 30 Mbps of advertised download speed), in which the cost per Mbps is significantly lower. This explains part of the price gap between LATAM and OECD countries: on average, in developed countries a Mbps of download speed is seven times less expensive than in Latin America (USD PPP \$7.2 in OECD vs. USD PPP \$53.7 in LATAM). However, it is worth highlighting the strong

² See Galperin and Ruzzier (in press).

performance of a group of countries in the region (most notably Uruguay, Mexico and Chile) where the Mbps of advertised download speed is, on average, comparable in price to OECD countries.

The trend analysis reveals a widespread drop in access prices in Latin America over the last two years. Figure 4 shows that, on average, the subscription price to the least expensive broadband plan fell 28% between 2010 and 2012. Considering the good macroeconomic performance of the region during this period, the data suggest an expansion of access opportunities to the service. However, the data also show that this trend is not widespread; in some countries in the region, the minimum expenditure required to access broadband has increased. While each of these cases must be analyzed individually, the results suggest the need to monitor market developments in these countries and evaluate sector-specific policies to reverse this trend and expand the current boundaries of the market.

Figure 4: Variation of monthly price of the least expensive fixed broadband plan (USD PPP), 2010 vs. 2012

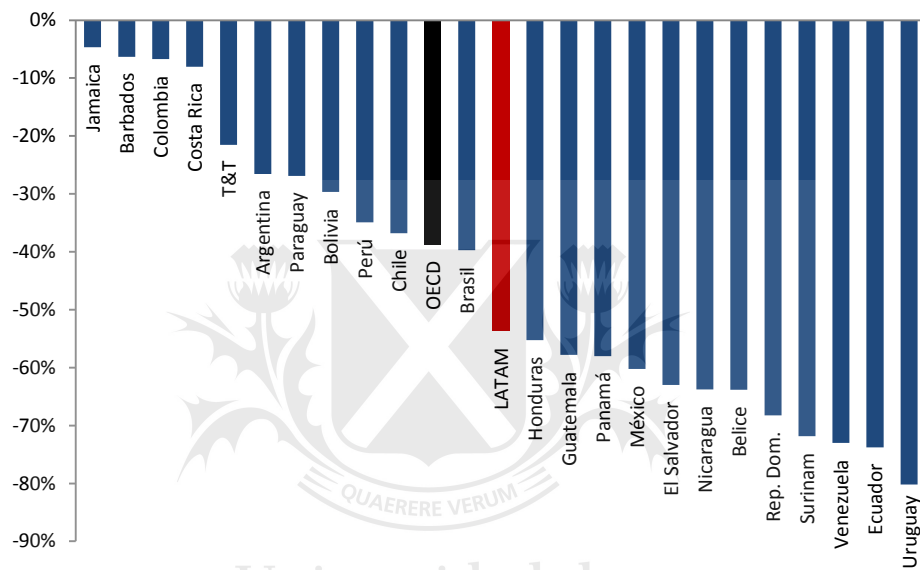


Source: author's survey.

Price drops are even greater when considering the standardized indicator—the price per Mbps of download speed implicit in the plans offered in each market. On average, the price per Mbps of download speed in the region has dropped 54% between 2010 and 2012. In OECD countries, this drop reached 39%, suggesting a slow convergence of access prices between these two regions. Figure 5 reveals, however,

that there are significant differences within the region in regard to this general trend. Interestingly, the downward trend in prices is above average in some of the countries with the lowest levels of broadband development, such as Ecuador, Suriname and the Central American countries (except Costa Rica). This result highlights the potential for less mature markets, and allows a moderate optimism about penetration growth in countries lagging the farthest behind in the region.

Figure 5: Variation in average price per Mbps of download speed of fixed broadband plans (USD PPP/Mbps), 2010 vs. 2012



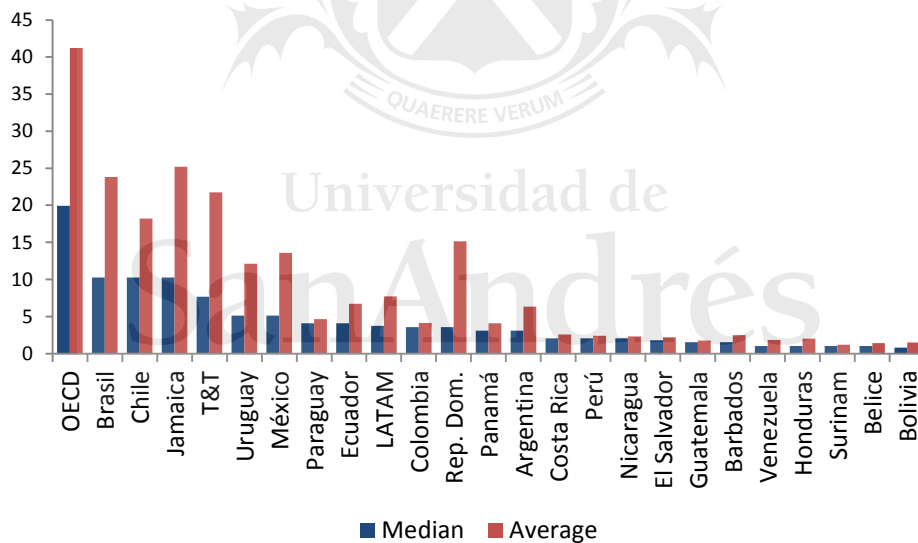
Source: author's survey.



3. Broadband service quality: current situation and trends

The adoption of broadband is related not only to price but also to other supply features such as the quality of service offered by leading service providers, for which the most relevant quality indicator is the advertised data download speed.³ As Figure 6 shows, there is a wide variance in advertised speeds in the region. In more mature markets such as Brazil and Chile the “typical” plan offered by operators (median quality) reaches 10Mbps. This contrasts with the quality offered in less developed markets such as Bolivia and most Central American countries, where the typical plan offers a download speed of less than 2Mbps (the contrast is even greater using average quality, which tends to favor markets where higher-speed plans are offered).

Figure 6: Average and median advertised download speeds (in Mbps), Q2 2012



Source: author’s survey.

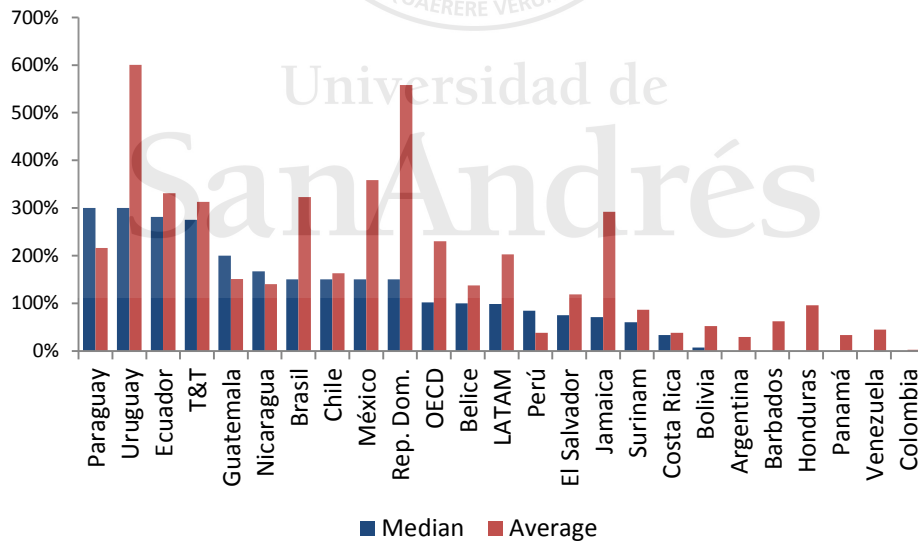
On average, the advertised speed for the “typical” broadband plan in the region is five times lower than in developed countries (3.7 Mbps in LATAM vs. 19.9 Mbps in

³ There is an extensive debate regarding the measurement of the true service quality provided by ISPs; however, this debate is beyond the scope of this paper. For a summary of this debate, see Bauer et al. (2010).

OECD). This reflects the scarce supply of high-speed plans (at least 30 Mbps) in the region, available in only nine of the 23 countries surveyed. At the same time, the very limited deployment of Fiber-to-the-Home (FTTH) infrastructure in the region limits the supply of very high-speed plans (at least 100 Mbps), available today in only six countries in the region.⁴ This contrasts with the situation in OECD member countries, where plans with download speeds higher than 100 Mbps are widely available.

The trend, however, indicates an increase in quality of service across the region, as shown in Figure 7. Generally the evidence shows a significant increase in advertised speeds between 2010 and 2012, although in some countries the “typical” speed (median speed) remains constant. The median advertised speed in the region has doubled between 2010 and 2012, from less than 2 Mbps to almost 4 Mbps. However, during this same period the average speed in OECD countries has also doubled (from 10 Mbps to 20 Mbps download speed). As a result, the quality of service gap that separates the two regions has remained constant.

Figure 7: Variation of advertised download speed (in Mbps), 2010 vs. 2012



Source: author’s survey.

⁴ In fact in Latin America plans with a minimum of 100Mbps of advertised download speed are supplied via DOCSIS (cable modem) and xDSL, not FTTH.

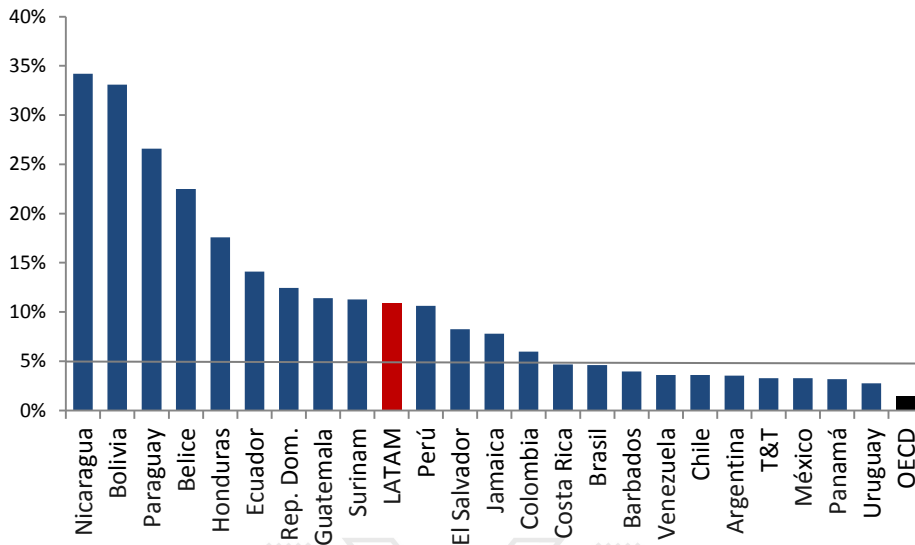
4. Affordability and the expansion of the broadband market

Broadband affordability refers to the relation between the price of the service and income levels of the population in a given market. This is a key indicator to estimate the relative effort households and microenterprises must make to access broadband. While there is no consensus in terms of a desirable level of broadband affordability, several demand studies suggest that adoption is significantly stymied when service prices are above 5% of per capita income. Moreover, the well-known disparities in income distribution in Latin America suggest that average affordability levels must stand below this threshold for broadband to reach broad penetration in the region.

The results show that affordability remains a key barrier to broadband adoption in the region. On average, the price of the “typical” plan in the region accounts for 11% of per capita income, which is more than double the suggested affordability threshold. However, the strong performance of a group of countries (most notably Uruguay, Panama and Mexico) should be noted. In these countries, subscriptions to “typical” broadband plans represent less than 5% of monthly per capita income (Figure 8).

The benchmarking analysis indicates that, on average, a household in Latin America must make an effort seven times greater than an OECD household to afford the “typical” broadband plan available in the respective markets. Even in those countries in the region with lower access prices and higher income levels (such as Uruguay, Mexico and Venezuela), this effort is twice that of the average household in OECD member countries. Thus reducing this affordability gap represents an important challenge for the widespread use of broadband services in the region.

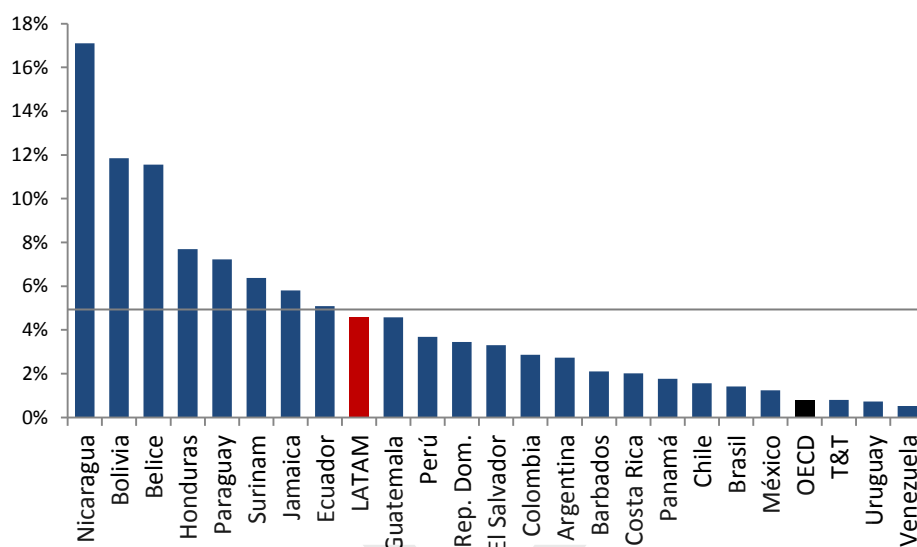
Figure 8: Monthly price of fixed broadband subscription (median) as a percentage of per capita income, Q2 2012.



Source: author’s survey and IMF.

The region’s affordability levels improve significantly when considering the least expensive plan available in each market. On average, the relation between the price of the least expensive broadband plan and per capita income is slightly below the 5% threshold (4.6%). Moreover, as shown in Figure 9, 16 of the 23 countries surveyed are below the specified affordability threshold. While affordability remains a significant concern in some countries with high broadband prices and low incomes (such as Nicaragua and Bolivia), in general the results allow for cautious optimism about the expansion of fixed broadband markets in those countries where per capita incomes are rising and broadband prices continue to drop.

Figure 9: Monthly price of fixed broadband subscription (least expensive plan) as a percentage of per capita income, Q2 2012.

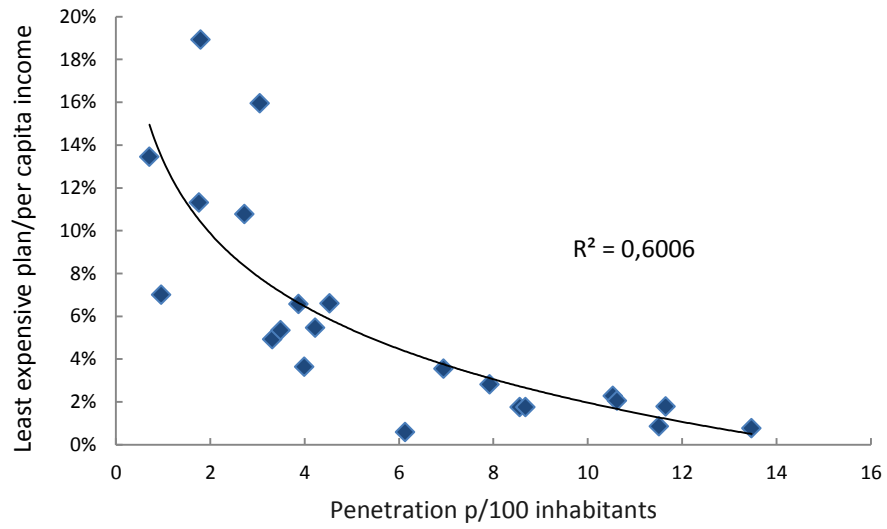


Source: author's survey and IMF.

This optimism is also related to the growing effort of countries throughout the region to reduce connectivity prices. As shown by Galperin et al. (2012), the national broadband plans adopted by several countries in the region in recent years are strongly geared towards promoting basic connectivity plans to lower-income households. This contrasts with broadband initiatives in OECD countries, whose main objectives are associated with the deployment of high-speed services over next-generation networks.

The results of this study validate this strategy. As Figure 10 shows, broadband penetration in Latin America is strongly associated with the affordability of the least expensive plans in each market ($R^2=0.60$). The association between penetration and average or median prices is significantly weaker ($R^2=0.36$ and $R^2= 0.43$, respectively). This suggests that the future expansion of fixed broadband markets in Latin America largely depends upon the adequate supply of basic connectivity plans aimed at segments of the market yet to be fully tapped.

Figure 10: Affordability of the least expensive fixed broadband plan and penetration per 100 inhabitants, Q2 2012.



Source: author's survey, IMF and ITU.



5. Conclusions

After many years of growing at rates close to 50%, the fixed broadband market in Latin America has begun to show signs of slowing down. Several indicators suggest that this slowdown is the result of service saturation in higher-income urban areas, while penetration among medium and low-income households grows at rates much slower than desirable (Flores and Mariscal, 2010). Expanding the boundaries of the fixed broadband market towards these households represents one of the main challenges for telecommunications policy in the region over the coming years.

Several studies show that broadband adoption is a multidimensional phenomenon determined by many structural variables, including household income, education levels and age composition (Chinn and Fairlie, 2006; Hauge and Prieger, 2010). These structural variables depend on long-term factors upon which sector-specific policymakers have limited room for action. Thus in order to accelerate the adoption of broadband in the short term, countries throughout the region must implement strategies that impact other determinants of Internet adoption.

The price of services is one of these key variables. Several studies show that fixed broadband demand is relatively elastic to price in emerging markets, which suggests the need to seek ways to reduce connectivity costs to induce market growth.⁵ The results of this study indicate that fixed broadband prices in Latin America remain above the thresholds that promote the widespread adoption of the service. Furthermore, a comparison with more developed countries suggests that there is ample room for price reductions and service quality improvements. Several countries in the region have recognized this challenge, undertaking regulatory changes to increase competition in the broadband market, and simultaneously inducing the supply of basic connectivity plans.

The expansion of broadband markets in Latin America also requires further segmentation not only in terms of price but also in other supply characteristics, specifically payment models and service bundling. Innovative business models in the fixed broadband segment are yet to emerge in the region. For example, prepaid

⁵ Galperin and Ruzzier (in press) estimate that a 10% average drop in the cost of fixed broadband service in Latin America would result in a 22% increase in the penetration rate, which equals to approximately 10 million additional connections.

plans for fixed broadband service are currently offered only by state-owned operators in Venezuela and Uruguay. Several studies show that this payment model encourages technology adoption among low-income customers by allowing them to adjust their spending based on income fluctuations characteristic of this segment (Mariscal et al., 2009).

By contrast, there is a growing supply of bundled services in the region. Although bundles of broadband and local phone service are predominant, there has been a significant increase in the supply of broadband and pay TV packages; previously restricted to larger markets, they are now available in almost every country in the region (18 of the 23 countries surveyed). This reflects new investments made by cable-TV operators, as well as a regulatory environment more conducive to the entry of telecom operators in the content business. Additional evidence is the increase in the number of countries (16 in 2012, up from 11 in 2011) where operators offer “triple-play” packages (broadband, telephony and pay TV). This increase is significant in the face of persistent regulatory hurdles to the supply of converged services in some very significant markets, including Argentina and Mexico.

As shown by several studies, service bundling has a potential positive effect on broadband adoption as it reduces the additional expense faced by users that already subscribe to other services (OECD, 2011). However, other studies suggest the need to monitor these practices and ensure the provision of unbundled broadband services, especially in the many countries in the region where incumbent operators still hold significant market power (Economides, 2012).

Finally, it is imperative to review the tax burden on broadband services. This survey shows that value-added taxes are levied on fixed broadband services in every country in the region, at rates ranging from 7% (Panama) to 22% (Uruguay), in addition to specific taxes levied on the service in various countries. As mentioned above, several studies show that the contribution of broadband to economic and social welfare increases with the level of penetration. Faced with this evidence, current tax policies penalizing broadband adoption entail a reduction in future economic and social benefits for the inhabitants of the region.

References

- Bauer, S., Clark, D., & Lehr, W. (2010). *Understanding Broadband Speed Measurements*. Presented at the 38^a Telecommunications Policy Research Conference, Arlington (VA), October 1-3.
- Chinn, M., & Fairlie, R. (2006), ICT Use in the Developing world: An Analysis of Differences in Computer and Internet Penetration, *Review of International Economics* 18(1): 153-167.
- Czernich, N., Falck, O., Kretschmer, T., & Woessmann, L. (2011). Broadband Infrastructure and Economic Growth. *The Economic Journal* 121(552): 505-532.
- Economides, N. (2012). *Tying, Bundling, and Loyalty/Requirement Rebates*. In Elhauge, E. (ed.), *Research Handbook on the Economics of Antitrust Law*. Northampton, MA: Edward Elgar.
- Flores, E., & Mariscal, J. (2010). Oportunidades y Desafíos de la Banda Ancha Móvil en América Latina. In Jordán, V., Galperin, H., & Peres, W. (eds.). *Acelerando la revolución digital: banda ancha para América Latina y el Caribe*. Santiago de Chile: CEPAL.
- Galperin, H., & Ruzzier, C. (2010). Las Tarifas de Banda Ancha: Benchmarking y Análisis. In Jordán, V., Galperin, H., & Peres, W. (eds.). *Acelerando la revolución digital: banda ancha para América Latina y el Caribe*. Santiago de Chile: CEPAL.
- Galperin, H., & Ruzzier, C. (in press). Price Elasticity of Demand for Broadband: Evidence from Latin America and the Caribbean. *Telecommunications Policy*.
- Galperin, H., Mariscal, J., & Viacens, F. (2012). *Oportunidades y Desafíos de los Planes Nacionales de Banda Ancha en América Latina*. Presented at the conference ACORN 2012, Valparaíso, Chile, May 17-19.
- Grazzi, M., & Vergara, S. (2011). Determinants of ICT Access. In Balboni, M., Rovira, S., & Vergara, S. (eds.), *ICT in Latin America: A Microdata Analysis*. Santiago de Chile: CEPAL.
- Hauge, J., & Prieger, J. (2010). Demand-Side Programs to Stimulate Adoption of Broadband: What Works? *Review of Network Economics* 9(3).

- Katz, R. (2012). Impact of Broadband on the Economy. ITU Broadband Series, April 2012. Geneva: ITU.
- Koutroumpis, P. (2009), The Economic Impact of Broadband on Growth: A Simultaneous Approach, *Telecommunications Policy* 33: 471-485.
- Lopez, P, & Hilbert, M. (2010). De la Brecha en Banda Ancha al Blanco Móvil del Ancho de Banda. In Jordán, V., Galperin, H., & Peres, W. (eds), *Acelerando la revolución digital: banda ancha para América Latina y el Caribe*. Santiago de Chile: CEPAL.
- Mariscal, J., Bonina, C., & Luna, J. (2009). *Nuevos Escenarios de Mercado en América Latina*. In Galperin, H., & Mariscal, J. (eds.), *Pobreza Digital: Perspectivas de América Latina y el Caribe*. Mexico City: Editorial CIDE.
- Noam, E. (2011). Let Them Eat Cellphones: Why mobile wireless is no solution for broadband. *Journal of Information Policy* 1: 470-485.
- OECD (2011). *Broadband Bundling: Trends and Policy Implications*. Paris: OECD.

