



> THE DIGITAL DIVIDE IN LATIN AMERICA: BROADBAND PRICE, QUALITY AND AFFORDABILITY IN THE REGION

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Summary

The purpose of this paper is to understand the state of broadband price, speed and affordability in 19 Latin American countries, using data from a study by DIRSI of plans offered in the region.

Analysis of the indicators shows that the region has advanced in terms of quality of access (speeds offered), although price outcomes are less optimistic. Disparities between countries are very significant, however. While some countries show significant progress, others lag in a high percentage of the indicators.

1. INTRODUCTION

For years, most of the countries in the region have been setting goals and implementing projects to ensure Internet and broadband access for all of their inhabitants. To achieve this, many governments have embarked on ambitious plans involving installing infrastructure, establishing connectivity programs and providing devices, as well as significant legislative reforms that modify regulations and the makeup of regulatory bodies, among other measures. One decisive factor in broadband access is the price people must pay to have it in their homes or on their mobile devices. Infrastructure plans therefore generally aim to ensure coverage (to solve the problem of high fixed costs, which operators consider unprofitable to assume), while regulatory measures seek to discipline prices and/or promote competition to ensures prices that are close to average production costs.

The purpose of this paper is to analyze how much Latin American citizens are paying now for access to fixed broadband and mobile broadband. An affordability indicator is also analyzed, which shows the monthly price of having broadband as a percentage of the country's per-capita GDP, as well as data about the quality promised by broadband plans. Data are presented for 19 countries in the region, which allows comparison among them.

This study was made possible thanks to DIRSI's efforts since 2010 to gather information annually about broadband service in these 19 Latin American countries. This data collection follows guidelines proposed by the ITU and OECD, with broadband understood as being services that promise a data download speed higher than 256 Kbps. Data were gathered for operators with market shares of more than 10 percent. Data were collected in the second quarter of each year and include fixed broadband plans (residential segment) and mobile broadband (smartphones and PCs). In 2015, information was gathered about 1,215 plans offered by 50 fixed broadband providers.¹ Information was also collected about 1,700 mobile broadband access plans offered by 46 operators.² To provide information that can be compared among countries, all prices are presented in U.S. dollars (USD), adjusted using purchasing power parity (PPP) indices.³

Analysis of the indicators shows that the region has improved in terms of quality of access (speeds offered), although outcomes in the area of price

¹ This figure is the sum of the number of operators about which information was gathered in each country. If regional operators are considered, the number is 35.

² Information was collected about 46 mobile broadband operators in 19 countries, although if regional operators are considered, the total is 12.

³ The implicit PPP exchange rate published by the IMF is used.

are less optimistic. Disparities among countries are significant. While some countries seem to be making substantial progress, others appear to lag in most indicators.

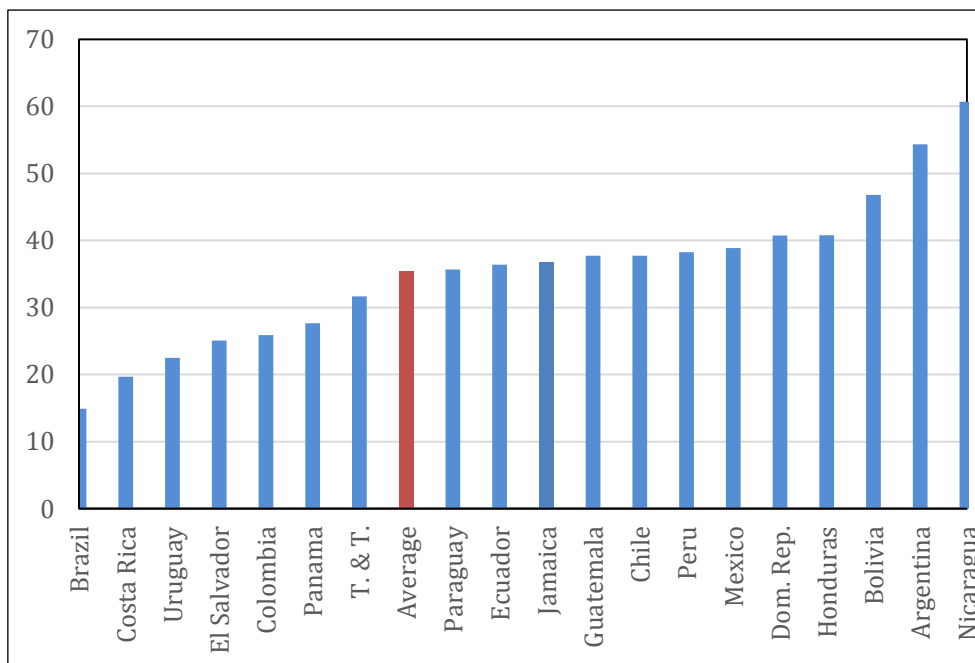
The paper is organized as follows: Section 2 presents price and quality data for fixed broadband; Section 3 analyzes those data for mobile broadband; Section 4 describes affordability findings; and Section 5 offers a preliminary analysis of packages offered in the region. Section 6 presents a discussion and conclusions.

2. FIXED BROADBAND

2.1 Fixed broadband prices

The price of the least expensive plan is analyzed first. Although it does not consider other characteristics of the plan (speed, caps, etc.), this indicator is an approximation of the minimal expense that a household must incur for access to fixed broadband service in each country. Figure 2.1 shows the least expensive plan for each country, of those that include only broadband and have a cap of at least 1 Gb.⁴

Figure 2.1: Least expensive fixed broadband plans (US\$ PPP)



According to Figure 2.1, the most expensive fixed broadband in the region is Nicaragua, Argentina and Bolivia.⁵ At the other extreme, the countries that offer the most affordable plans are Brazil, Costa Rica y Uruguay. Differences among countries in the possibility of access are significant. For example, the price of the least expensive plan in Nicaragua is four times that of the least expensive plan in Brazil. It should be noted that this

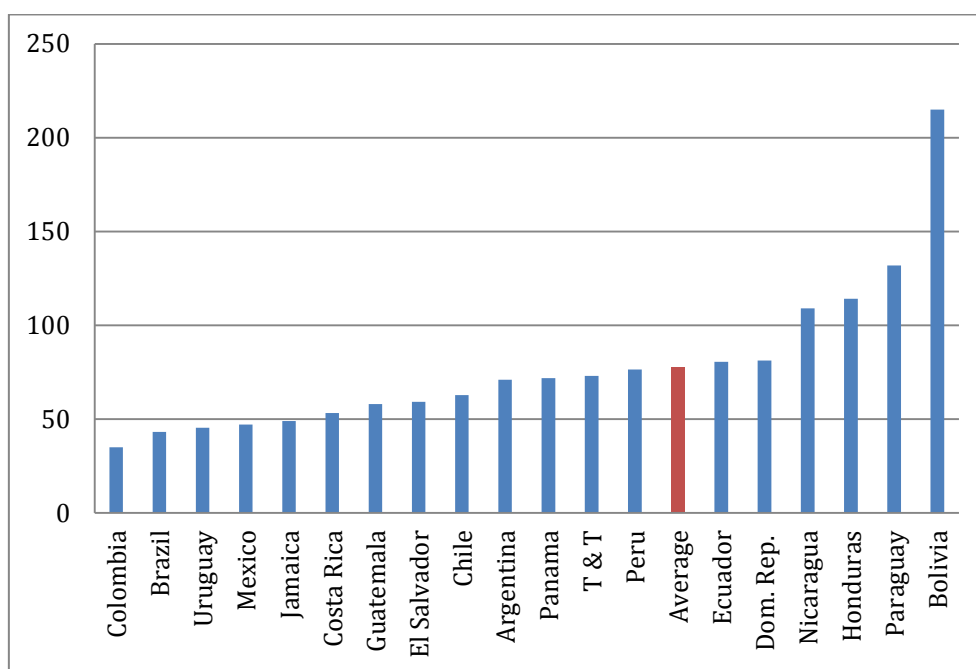
⁴ A data CAP limits data transfer to a certain amount in a given period of time.

⁵ Data in US\$ PPP for Argentina should be viewed with some caution because of the split exchange rate in that country at the time the data were collected.

plan in Brazil (Banda Larga Popular) is the result of a public-private agreement to offer a low price to the entire population.⁶

In comparing countries, it is also interesting to observe the median of the broadband plan prices. The median is the point in the center of the plans, organized from lowest to highest for each country, and can be interpreted as the country's "typical plan." Figure 2.2 shows that this indicator changes the countries' relative positions. This is true for Argentina and Mexico, which have some of the highest prices for the least expensive fixed broadband plans, but show low medians, especially Mexico. In contrast, Paraguay, where the cost of the least expensive plan is relatively low, has one of the highest medians. Finally, countries such as Bolivia, Honduras and Nicaragua have among the highest values for both indicators.

Figure 2.2: Median fixed broadband plan prices (US\$ PPP)

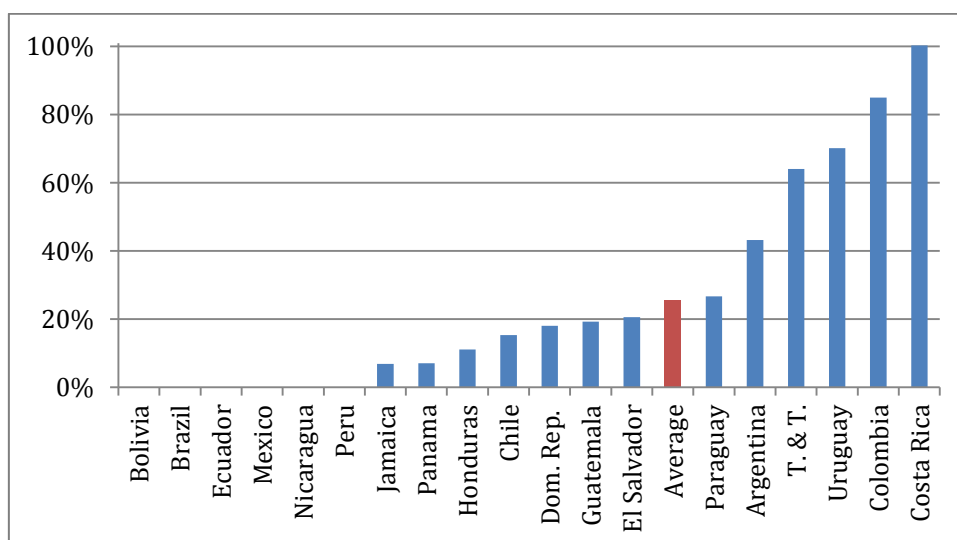


It is interesting to analyze the evolution of prices from year to year. Because comparison in PPP dollars could conceal elements that are not specific to the broadband market, it is useful to analyze variations in the

⁶ In some countries, there are specific plans (generally with restrictions) for low-income sectors; these were not considered in the data collection, because the aim was to include plans available to any sector of the population. For information about these specific plans, see Katz, R. and Callorda, F. (2015), *Experiencia de planes subsidiados o con tarifas sociales* (study commissioned by the Government of Ecuador, Ministry of Telecommunications and the Information Society). That study highlights plans with prices differentiated by socioeconomic strata in Colombia; Ecuador's Plan Social, which is conditioned on certain household requirements; and ANTEL's plan in Uruguay, with a zero price and a limited cap.

prices of the least expensive plans in local currency (this comparison is valid for discussing variations, as it is not necessary to have a common unit of currency). Figure 2.3 shows that in six countries (Bolivia, Brazil, Ecuador, Mexico, Nicaragua and Peru), the price of the least expensive plan measured in local currency did not change, while in the other countries, it increased.⁷ The latter is noteworthy and worrisome, because except in Argentina, inflation levels have been very low, in the single digits in all of the countries, while in most of the countries where the prices of the least expensive plans have risen, the increases have been in the double digits. In other words, in 12 of the countries for which data were collected, the price of the least expensive plan has risen more than the corresponding rate of inflation.

Figure 2.3: Variation 2014/2015 of least expensive fixed broadband plans (local currency)



2.2 Fixed broadband speed

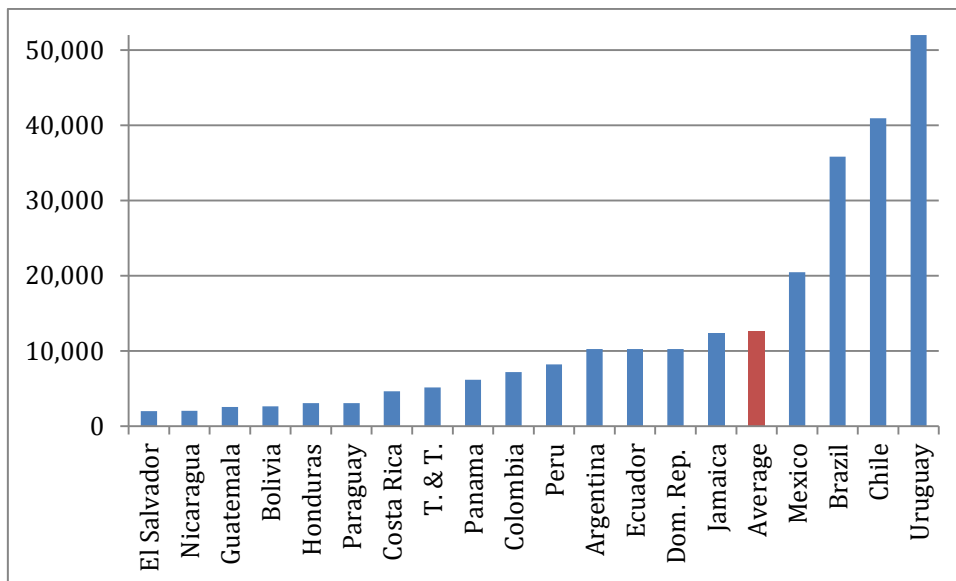
This section discusses the profile of speeds offered in broadband plans (this does not mean it is the real speed enjoyed by users at all times). Figure 2.4 shows the median speed for each country.⁸ This measure provides an approximation of what can be considered the “typical speed” for each country.⁹

⁷ Of the countries in which the price did not change, only in Peru does this involve a different operator’s plan with a lower speed. Both the price and the speed increased for the plan that had been the least expensive in 2014.

⁸ The median speed is the speed that is at the center of the speeds of plans when organized from slowest to fastest for each country.

⁹ Note that the data gathered and presented correspond to the speeds published by operators for the country’s capital or principal city.

Figure 2.4: Median download speed (Kbps)- 2015

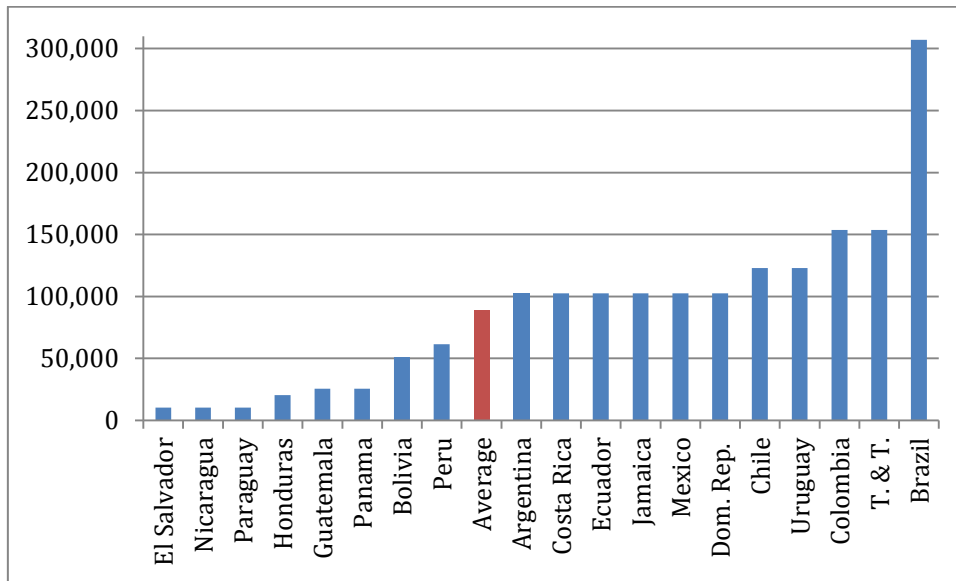


The median indicator is led by Uruguay, Chile and Brazil. At the other extreme are El Salvador, Nicaragua and Guatemala. Bolivia, which was in last place in 2014, has improved its relative situation slightly. The same is true of Peru, which was among the three countries with the slowest medians in 2014 and now holds an intermediate place.¹⁰

Figure 2.5, which follows, shows the maximum download speed in the plans in each country. The maximum speed indicator indicates the group of countries that already have a supply supported by fiber or cable with current technology.

¹⁰ See "Banda ancha en América Latina: precios y tendencias del mercado," DIRSI 2015.

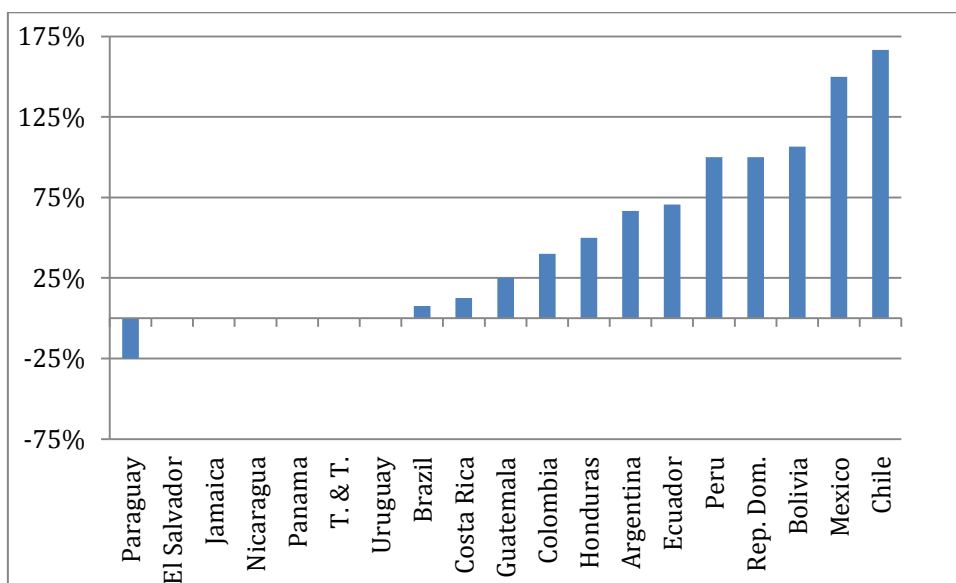
Figure 2.5: Maximum download speeds (Kbps)- 2015



Both figures (2.4 and 2.5) and indicators reveal significant regional disparities in quality of access. While the offered median speed in Uruguay is 50 Mbps, El Salvador and Nicaragua have 2 Mbps. And while 11 countries now have plans with speeds of 100 Mbps or more (Brazil stands out, with a fiber-supported plan of 300 Mbps), in three countries the maximum speed does not exceed 10 Mbps.

Figure 2.6, which follows, shows how much the median download speed changed between 2014 and 2015.

Figure 2.6: Variation in median speed (% 2014- 2015)



Brazil, Jamaica, Panama and Uruguay already had relatively high medians in 2014, so there was little or no variation in 2015. Chile was near the top in 2014, but still registered a significant positive variation. Bolivia and Peru were near the bottom of the medians in 2014, but had some of the greatest variations in 2015, showing an improvement in both their absolute and relative situation. Finally, there is a group of countries that have not improved in either type of this indicator (El Salvador, Nicaragua, Trinidad & Tobago) or are in a worse position (Paraguay).

2.3 Joint analysis of price and speed

So far, we have compared countries based on the prices of broadband plans and the speeds offered by the plans. In this section, we analyze price and speed data jointly to provide a more complete picture of the relative situation of the region’s countries.

First, Figure 2.7 shows the median download price per Mbps for each country. This indicator allows an approximation of price per mega downloaded. Countries with high prices and low speeds appear at the extreme right of the graph (Bolivia and Nicaragua), and those with low prices and high speeds stand out at the extreme left, with medians of price per mega below US\$3 PPP (Uruguay, Brazil and Chile).

Figure 2.7: Median download price per Mbps (US\$ PPP)

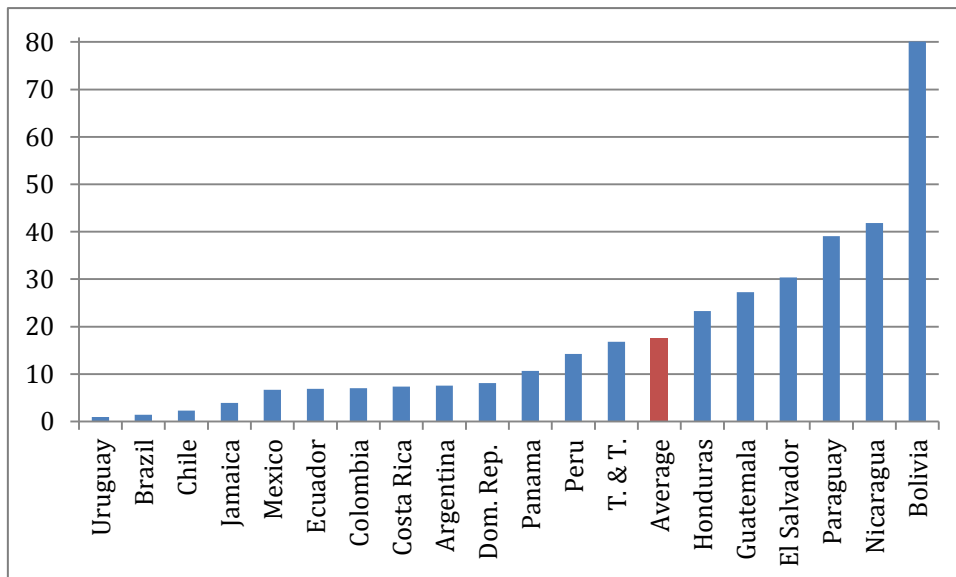
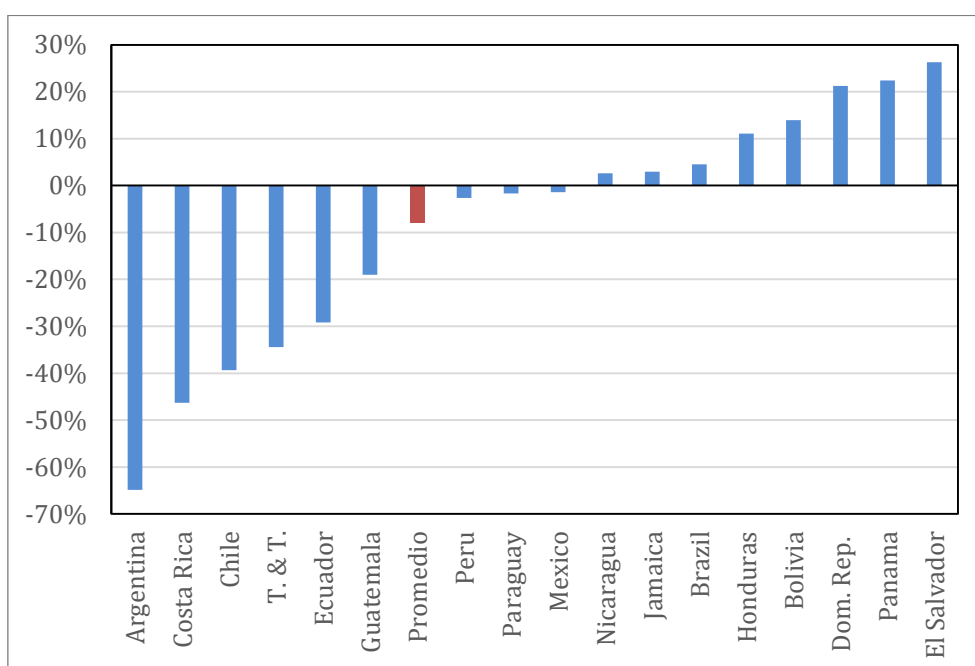


Figure 2.8 shows the variation in the download price per Mbps for the least expensive plans between 2014 and 2015.¹¹ In PPP dollars, the price per Mbps in Argentina, Costa Rica, Chile and Trinidad & Tobago has decreased by more than 30 percent. Ecuador and Guatemala have seen a decrease of about 25 percent in the price per Mbps (in US\$ PPP). The average price per Mbps for the least expensive plans in the region therefore decreased by 8 percent between 2014 and 2015. Most of the decrease in the prices per Mbps resulted from higher speed at a similar price, which can be interpreted as an improvement in the quality of service.

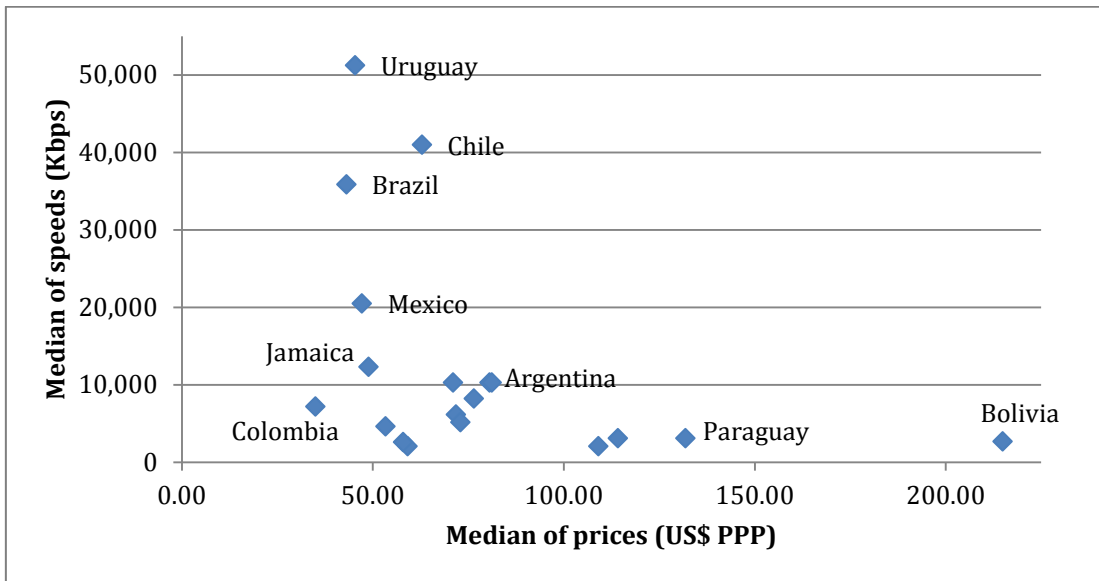
Figure 2.8: Variation 2014/2015 in price per Mbps of least expensive fixed broadband plans (US\$ PPP)



The following graphs show the pairs of means of prices (horizontal axis) and speeds (vertical axis) per country. Figure 2.9 enables us to identify a group of better-positioned countries (in the upper left quadrant) that have a median speed faster than 20 Mbps and a median price of less than US\$65 PPP (Uruguay, Chile, Brazil and Mexico). The worst-positioned countries are in the lower right quadrant, with a median speed that does not exceed 3 Mbps and a median price exceeding US\$100 PPP (Bolivia, Paraguay, Honduras and Nicaragua).

¹¹ Uruguay and Colombia are excluded from the analysis, as there was a change in the cap of the most economical plans between 2014 and 2015.

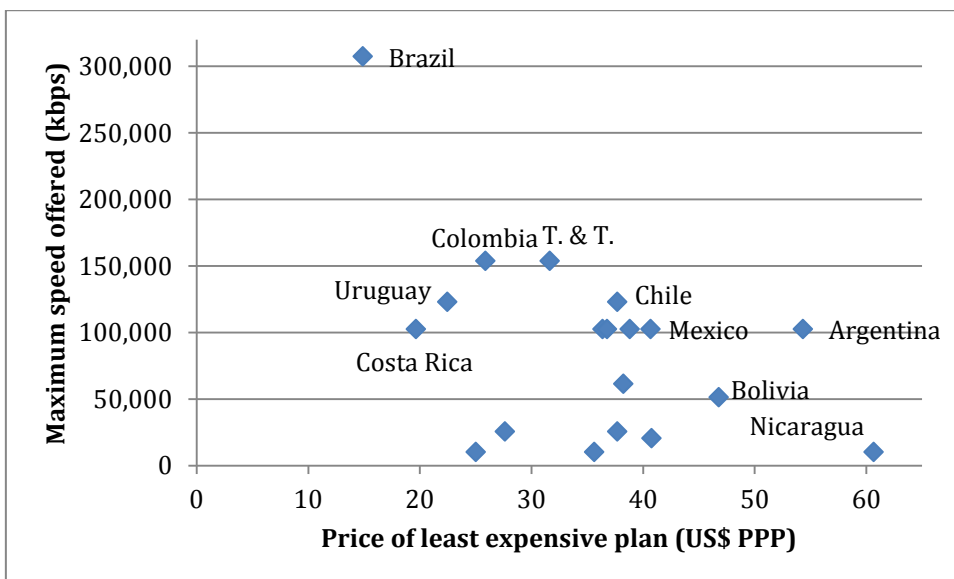
Figure 2.9: Median of prices (US\$ PPP) and speeds (Kbps)-2015



Finally, the remaining countries grouped in the lower left quadrant show median speeds slower than 20 Mbps (and most slower than 10 Mbps), along with median prices between US\$35 and US\$80 PPP.

Figure 2.10, which follows, shows jointly the situation of each country with regard to the least expensive broadband plan (horizontal axis) and maximum download speed offered (vertical axis). These two variables approximate the concept of price of entry into the market for a fixed broadband user (affordability) and the maximum currently offered by that market in terms of broadband quality (potential).

Figure 2.10: Least expensive plan and maximum speed offered



Figures 2.9 and 2.10 suggest two types of analyses and conclusions. Figure 2.9 shows the “typical situation” of prices and speeds in the countries. Figure 2.10 provides an overview of “affordability-potential” for each country. Affordability is determined by the least expensive plan, and potential is reflected in the maximum speeds offered, which also indicate the existence of infrastructure that supports those speeds. Uruguay, Chile, Brazil and Mexico head the “typical situation,” as they are the countries that offer the lowest medians of price and speed in the region. In contrast, Bolivia, Paraguay, Honduras and Nicaragua present a “typical situation” that is more worrisome.

Brazil also leads in “affordability-potential,” by a notable margin, followed by Colombia, Uruguay and Costa Rica. Once again, Nicaragua lags in this indicator, but Bolivia stands out relatively in the “potential” variable, with a maximum speed of 50 Mbps. Mexico and Chile, which stand out in the “typical situation” and “potential” do not achieve the same ranking in “affordability.” It is important to note that this analysis should be supplemented with a study of the plans’ geographic coverage, although that does not fall within the objectives of this study.

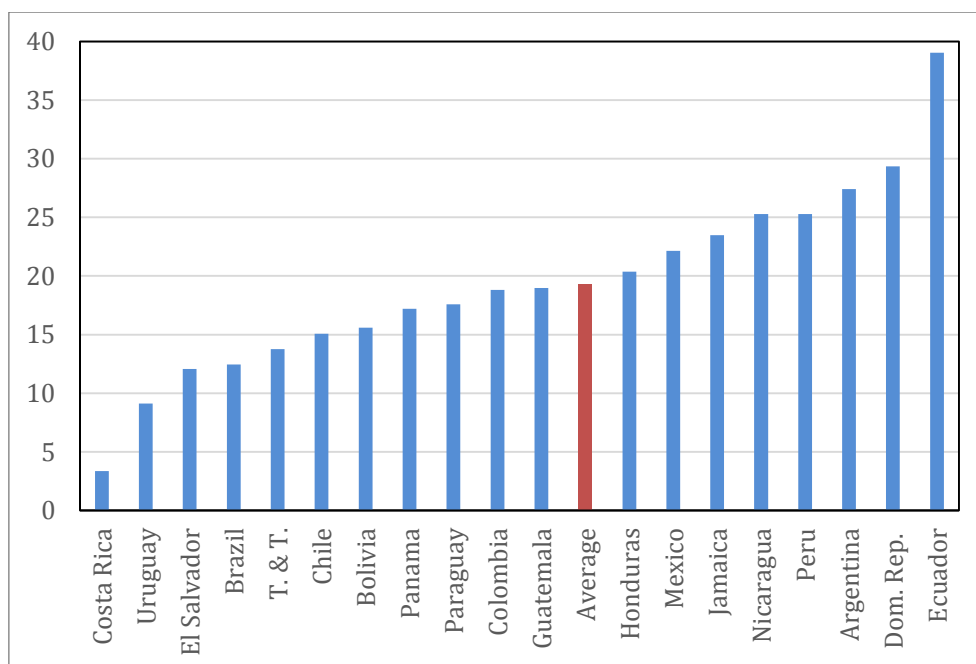
3. MOBILE BROADBAND

This section presents an analysis of mobile broadband prices similar to that for fixed broadband, but with attention to the former's particular characteristics. While the supply of fixed broadband varies in speed offered, the supply of mobile broadband varies depending on when payment is made (prepaid or postpaid), the service contract time frame and data download capacity, There are also plans for different types of devices (smartphones or PCs).

3.1 Mobile broadband prices

As with fixed broadband, the price analysis begins with a comparison of the least expensive plans, in this case with at least 1GB of downloading. The comparison in Figure 3.1 includes both smartphone and PC plans.

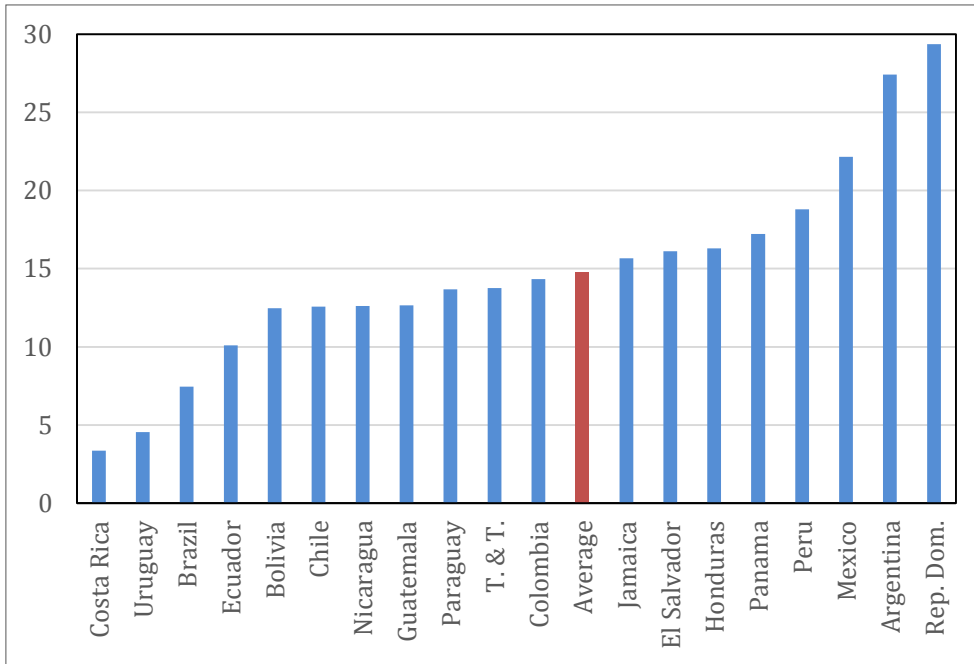
Figure 3.1: Least expensive 1GB mobile broadband plan 2015 (US\$ PPP)



Ecuador, the Dominican Republic, Argentina and Peru are among the most expensive, with prices above the average. Costa Rica, Uruguay and El Salvador remain among the least expensive in both markets.

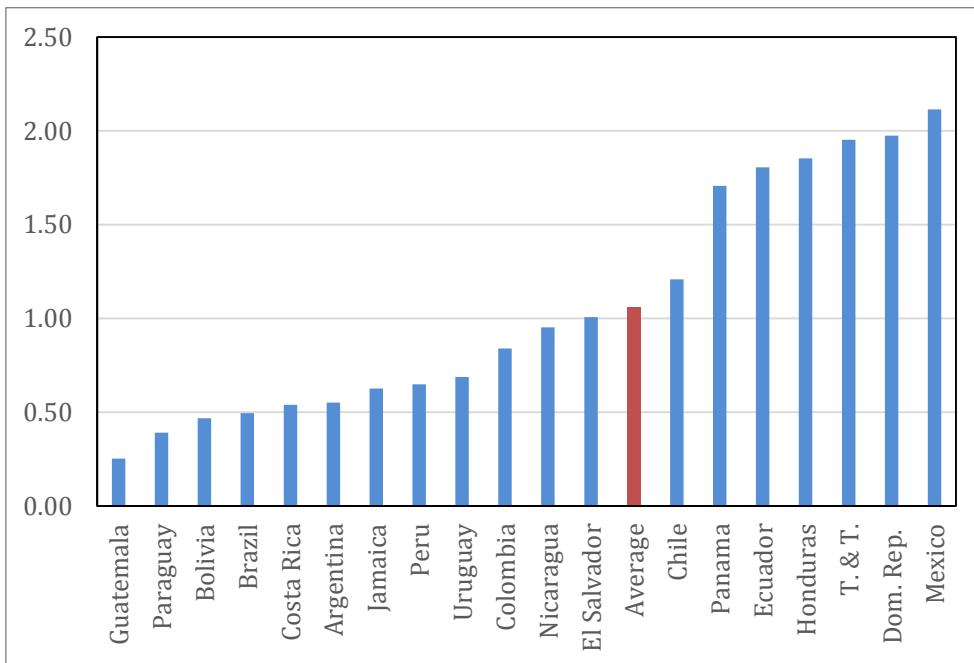
Figure 3.2 below shows the least expensive of the plans exclusively for smartphones, with a cap of at least 500 MB.

Figure 3.2: Least expensive 500 MB cap plan for smartphone - 2015 (US\$ PPP)



When we limit mobile broadband plans to those for smartphones and which have smaller download capacity, Ecuador no longer appears among the most expensive and Costa Rica continues to have the least expensive plan. Figure 3.3 below shows the price of one-day prepaid plans.

Figure 3.3: One-day prepaid mobile broadband plan with at least 10 MB of downloading – 2015 (US\$ PPP)



Argentina stands out in this indicator; in the indicators analyzed so far, it was among the most expensive, but it has a relatively inexpensive price per day. Mexico, meanwhile, has the most expensive price per day. Among economical plans, countries such as Guatemala and Paraguay also stand out, with low-cap plans (10 MB and 25 MB).

3.2 Zero-rating plans

This section summarizes some results about ZR plans that emerge from the data. Zero-rating (ZR) plans are those that give mobile telephony users access to some on-line content without having to pay for data use, or without having this access deducted from the data-use limit allowed by the plan. A plan's ZR characteristic is active or relevant to the extent that the use of low caps is generalized. In other words, in a market with high-cap plans, the consumer perceives the content included in the ZR and other content as being equal. Table 1, below, shows the existence of ZR by country and type of application considered, although it does not detail the various forms these plans can take between countries or operators. The table also shows the number of operators per country that offer some variant of ZR; note that the operators' own applications are not considered when identifying applications that determine a ZR plan. Countries that do not appear in the table did not have a ZR plan at the time the data were collected.

Table 1. Zero-rating plans in Latin America*

Country	N° operators*	Applications in ZR plans
Brazil	1	WhatsApp, Facebook and Twitter
Chile	1	WhatsApp, Facebook and Twitter
Colombia	3	WhatsApp, Facebook, Twitter, Skype, Yahoo Messenger, Gtalk, MySpace, Hi5, Linked In
Costa Rica	1	Whatsapp, Facebook
Dominican Rep.	1	WhatsApp
Ecuador	2	WhatsApp, Facebook and Twitter
El Salvador	2	WhatsApp, Facebook, Twitter, Messenger, Electronic Mail
Guatemala	2	WhatsApp, Facebook
Honduras	1	WhatsApp, Facebook

Jamaica	1	WhatsApp, Facebook, Twitter, Instagram, Wikipedia and Rdio
Mexico	1	WhatsApp, Facebook and Twitter
Nicaragua	1	Facebook and Twitter
Paraguay	2	WhatsApp, Facebook, Twitter, Google Plus, Myspace, Orkut, Google Talk, Yahoo Messenger, Skype, Yahoo, Hotmail, Gmail
Peru	1	WhatsApp, Facebook and Twitter
Trinidad & Tobago	1	WhatsApp, Facebook, Twitter and Instagram

* Number of operators offering some variant of ZR

The results emerging from the data in Table 1 can be summarized, in a stylized way, in the following points:

- In 15 of the 19 countries from which data were collected, there is at least one ZR plan variant.
- Considering operators by country, 21 operators in the region, of the 46 about which data were gathered, offer some variant of ZR.
- Whatsapp and Facebook are included in the ZR offers in 14 of the 15 countries and Twitter in 10.
- Other applications considered in ZR plans are Skype, LinkedIn, Instagram, Wikipedia and email, but their relative importance is very low.

Table 2 shows how the plans offering ZR vary in form of payment.

Table 2. Types of zero-rating plans in Latin America

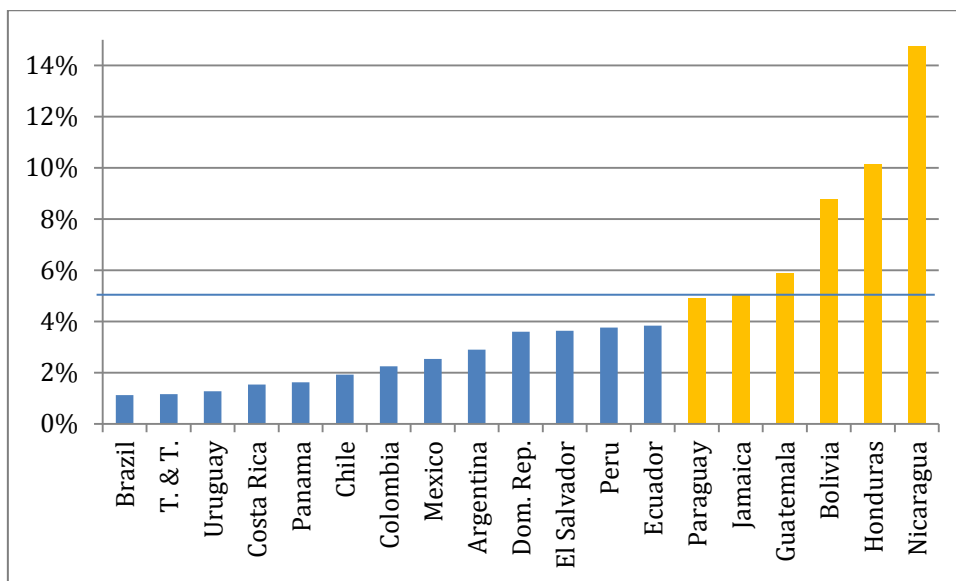
Country	N° of ZR postpaid plans	N° of ZR prepaid plans
Brazil	3	5
Chile	16	1
Colombia	30	34
Costa Rica	3	2
Dominican Rep.	1	0
Ecuador	62	5
El Salvador	13	15
Guatemala	17	21
Honduras	22	14
Jamaica	0	8
Mexico	0	3
Nicaragua	0	15
Paraguay	36	24
Peru	10	0
Trinidad & Tobago	3	14

In most of the countries, there are two types of ZR plans, postpaid and prepaid. Exceptions include Jamaica, Mexico and Nicaragua, where only prepaid plans appear, and Peru and the Dominican Republic, where they only appear in postpaid plans. Colombia and Ecuador stand out for the high number (variety) of plans that include some variant of ZR. This is partly explained by the number of operators offering them (Colombia is the only country with three operators offering forms of ZR), as well as by the strategies that dominate in these countries, where operators choose to resell a wide range of plans (varying in minutes of voice included, caps, speed, technology, etc.). Note that this tendency is seen again in Colombia and Ecuador in the supply of triple-play bundles (see Figure 5.1), confirming a strategy that is prevalent in these countries.

4. BROADBAND AFFORDABILITY

This section explores how much people in different countries in the region pay for broadband access in relation to their income level. An indicator is used that measures the cost of the least expensive broadband plan as a percentage of per-capita GDP in each country. Figure 4.1 shows this indicator for fixed broadband.

Figure 4.1: Price of least expensive fixed broadband plan as percentage of per-capita GDP – 2015



The literature tends to consider 5 percent as the threshold above which broadband is no longer affordable. According to this measure, fixed broadband was not affordable in 2015 in four countries: Nicaragua, Honduras, Bolivia and Guatemala. Two other countries—Jamaica and Paraguay—are at the limit of affordability. In Brazil, Trinidad & Tobago, Uruguay, Costa Rica, Panama and Chile, meanwhile, the percentage is not even 2 percent.

Figure 4.2 shows the same indicator for mobile broadband. The calculation is based on the least expensive mobile broadband plans with at least 1Gbps of download capacity. The comparison shows that mobile broadband is more affordable than fixed, as in nearly all the countries the percentage is less than 5 percent (only in Nicaragua and Honduras does it exceed 5 percent).

Figure 4.2: Price of least expensive 1Gbps mobile broadband plan as percentage of per-capita GDP– 2015

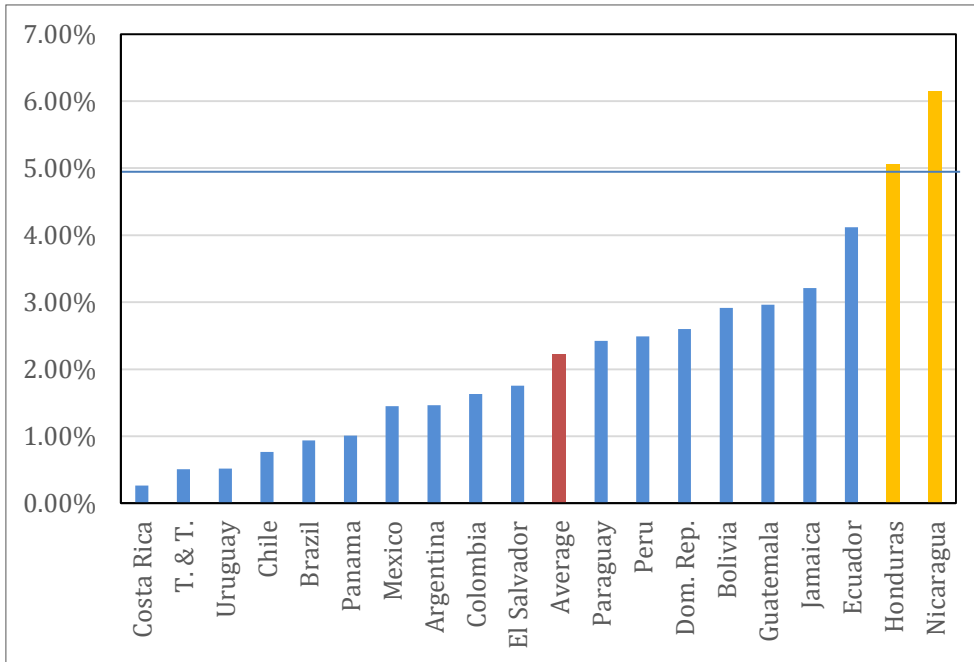
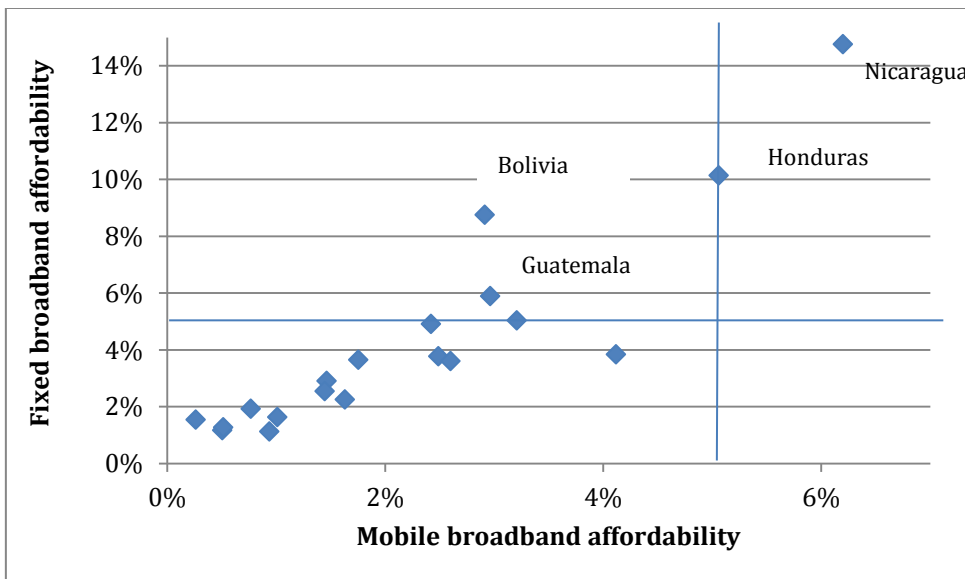


Figure 4.3 below summarizes this section and shows the countries distributed in four quadrants of affordability. The upper right quadrant contains the countries where fixed and mobile broadband are not affordable. Nicaragua and Honduras are the two countries in that quadrant.

Figure 4.3: Assessment of affordability in the region– 2015



The countries in the upper left quadrant have no fixed broadband affordability, but mobile broadband is affordable (Bolivia and Guatemala). Jamaica and Paraguay are at the limit of affordability for fixed broadband (on the horizontal line at 5 percent on the graph), but mobile broadband affordability is not constrained. The lower left quadrant shows the countries where both types of broadband are affordable (the rest of the countries in the sample). There are no countries in the lower right quadrant; that is, there are no countries where fixed broadband is affordable and mobile is not.

5. BUNDLING

Bundles offering more than one product (double and triple play) are a growing trend worldwide as a result of technological advances that make them possible and because this is a basic competitive strategy for telecommunications operators. The evidence particularly shows a significant increase in bundles that include a subscription to television services.¹²

It is more difficult to compare these bundles than plans that include only broadband, because besides the technologies and speeds offered, they also vary in the number and type of channels and content provided by the plans. This section briefly describes the bundle offers, particularly triple-play, found in the region, by country. Figure 5.1 shows the number of triple-play bundles available in each country.

Figure 5.1: Number of triple-play offers available, by country

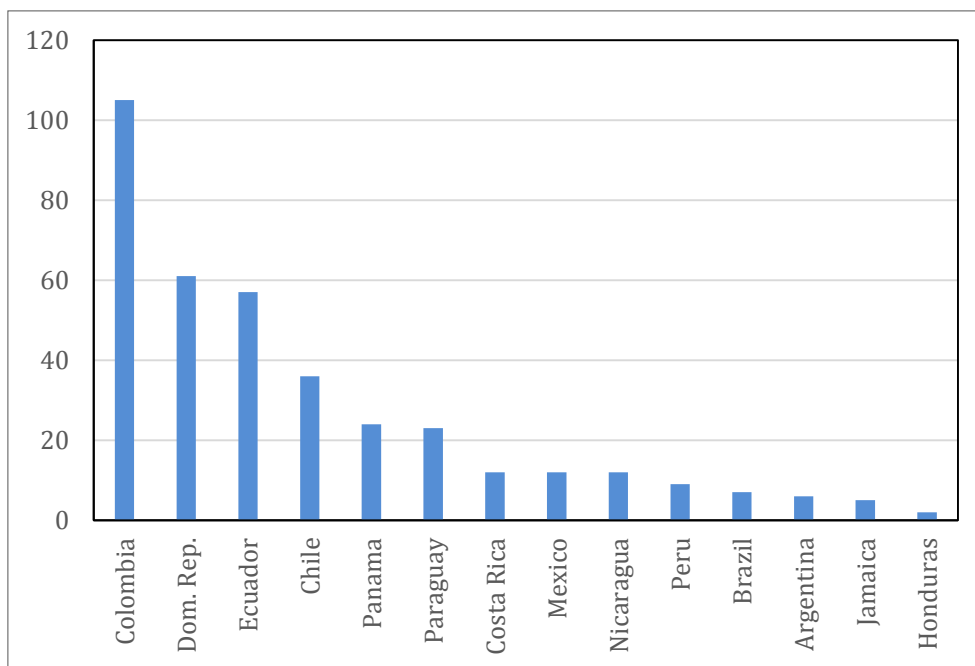


Figure 5.1 shows that of the 19 countries studied, 14 offer triple-play bundles. Colombia is the country where this type of offer is most widespread, with more than 100 different plans (combining different speeds of broadband service with different numbers of television channels and/or different basic telephony plans). It is followed by the Dominican Republic and Ecuador, with around 60 triple-play offers. In the

¹² Pereira, P. and Varela, J. (2013), *How will telecommunications bundles impact competition and regulatory analysis*, *Telecommunications Policy*, 37, 530–539.

other countries in the region, the number of bundles offered is substantially lower.

6. CONCLUSIONS

The purpose of this paper has been to understand the situation of 19 Latin American countries with regard to broadband price, speed and affordability, using data obtained by DIRSI from a study of plans in the region.

It is possible to show some optimism, because although tariffs are not decreasing, the speeds offered have increased in the past year. In fact, between 2014 and 2015, the price per Mbps of the least expensive plans has decreased by an average of 8 percent. Most of the decreases in the price per Mbps were due to a higher download speed at a similar price, which can be interpreted as an improvement in the quality of the service. One cause for concern, however, is that in 12 of the countries from which data were gathered, the price of the least expensive plan increased by more than the country's inflation rate. To draw more precise conclusions, it would be necessary to have data about the coverage offered by each type of plan, since in many cases the plans have limited coverage. In addition, as noted above, the speeds offered do not necessarily correspond to the stable speeds enjoyed by the users who contract the service.

Disparities among countries are significant in both dimensions. Some countries show notable progress in possibilities for price and quality. Brazil stands out particularly, with improvements in most of the indicators. It is accompanied, to a lesser extent, by Uruguay and Chile. Other countries are well below the averages for the region, as in the case with Bolivia, El Salvador, Nicaragua and Paraguay. It is important to highlight the role of mobile broadband in this regard, as it has affordable prices in some countries where fixed broadband is very expensive. This role of mobile broadband is also reinforced by the emergence of plans known as Zero Rating, which are available in 15 of the 19 countries for which data were collected.

To assess the degree of affordability by country, we have used an indicator that is imperfect, but widely used in the literature, which measures the price of the least expensive plan as a percentage of per-capita income in each country. Broadband is considered affordable if that percentage is below 5 percent. The results corroborate the findings described in the previous paragraph. While six countries have values close to or above that threshold for fixed broadband, only two countries exceed 5 percent for mobile broadband.

Finally, the data about triple-play bundles offered in the region indicate that 14 countries have such bundles. We have not conducted price comparisons for them, because they present more challenges than price comparisons for broadband access (because the content of the bundles' television component varies widely between countries and operators).