

Effective spectrum pricing in Colombia

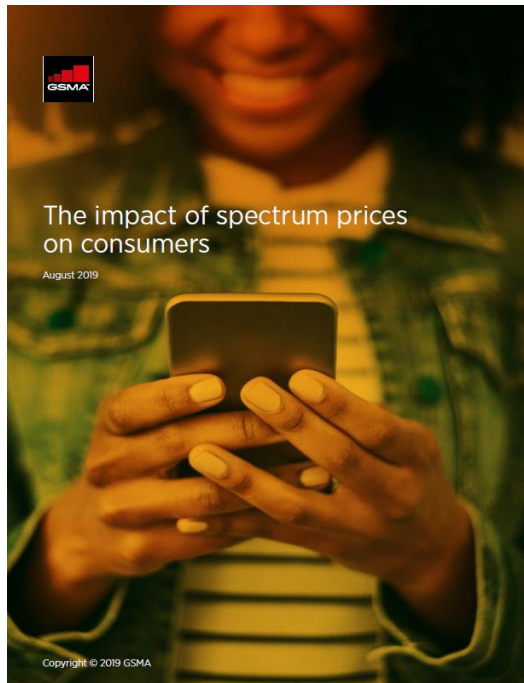
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AUTHOR




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Background: The impact of spectrum pricing on mobile consumers



- In 2019, GSMA carried out a study to assess the impact of spectrum pricing on mobile markets and consumers
- We analysed 229 operators in 64 countries (34 high income and 30 middle and low income) between 2010-2017
 - Most comprehensive study to date on the impact of spectrum policy on consumers.
 - Econometric model that assesses the impact of spectrum cost on coverage, network quality and final prices for users.
 - Robust statistical methods that isolate the effect and its direction from other factors.
- In Colombia, the price of spectrum has been increasing while operator revenues and profits have been declining. This may have constrained the ability and incentive for operators to invest in their networks. The results of the GSMA pricing study are used to assess the impact of spectrum policies on consumers in Colombia.

The negative impact of higher spectrum prices

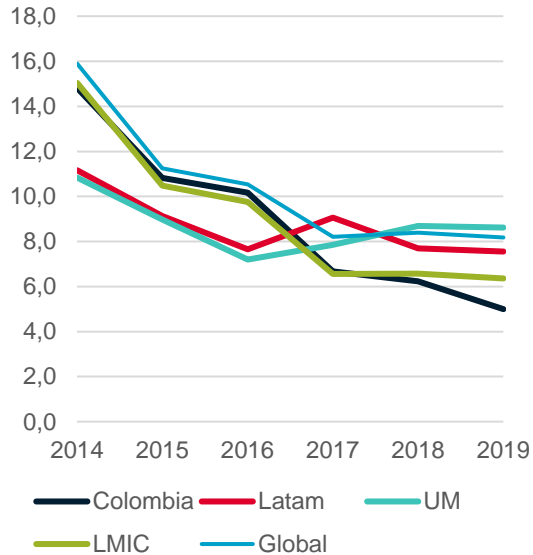
	Lower/middle-income countries	High-income countries
 Network coverage	Slower deployment of 3G and 4G networks	Slower deployment of 4G networks
 Network quality	Worse network quality (on all networks)	Slower download speeds on 4G networks
 Consumer prices	Indications that prices are higher, but inconclusive results	Inconclusive results – better data needed

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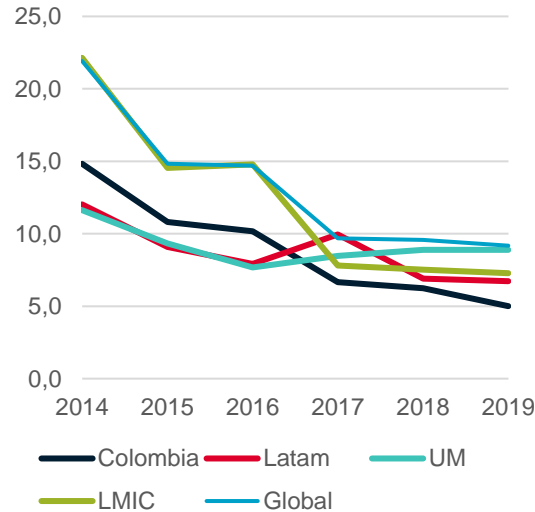
1. Colombian mobile market

Low prices in Colombia: The price of data in Colombia is below the Latam and international benchmarks for all three data usage baskets.

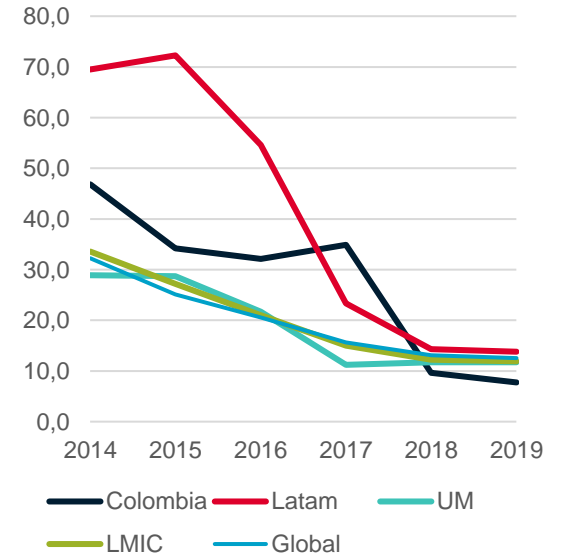
Cost of basket: low data usage (monthly USD)



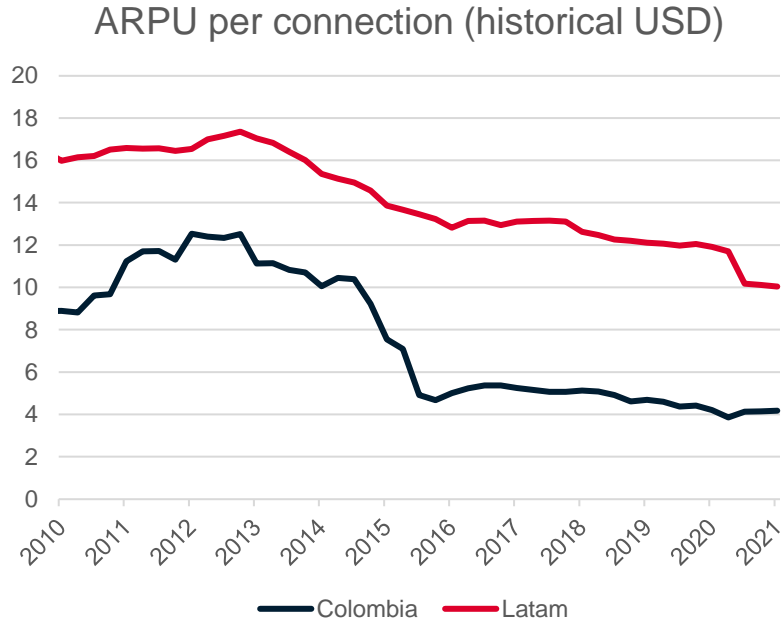
Cost of basket: medium data usage (monthly USD)



Cost of basket: high data usage (monthly USD)



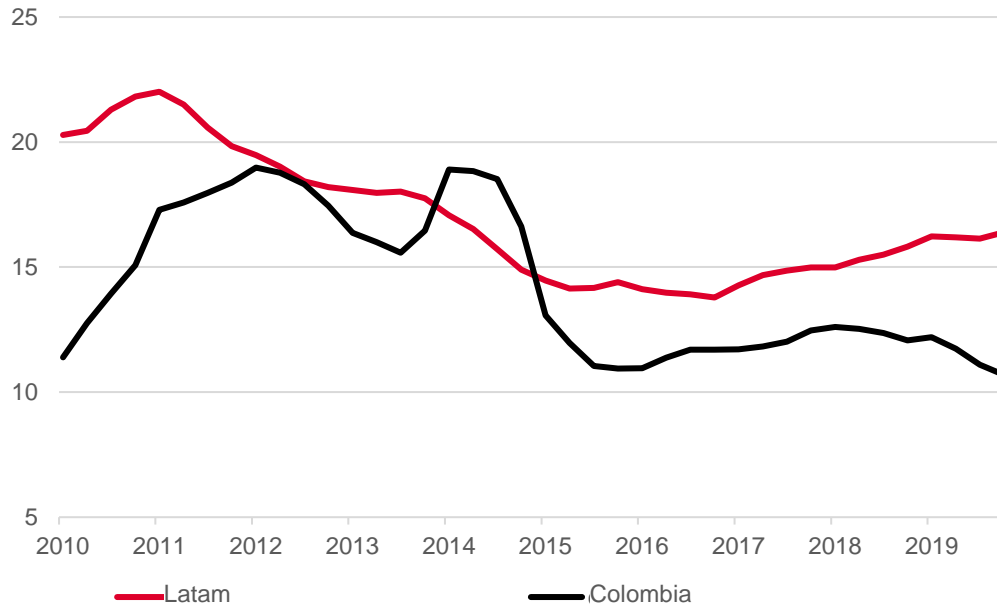
Falling ARPUs in Colombia: ARPUs in Colombia are consistently below the Latam benchmark, with the gap widening in recent years.



- Colombia is consistently below the Latam average for Average revenue per user (ARPU).
- ARPU falls for Colombia around 2014.
- This measure is based on total recurring (service) revenue generated per connection per month in the period.

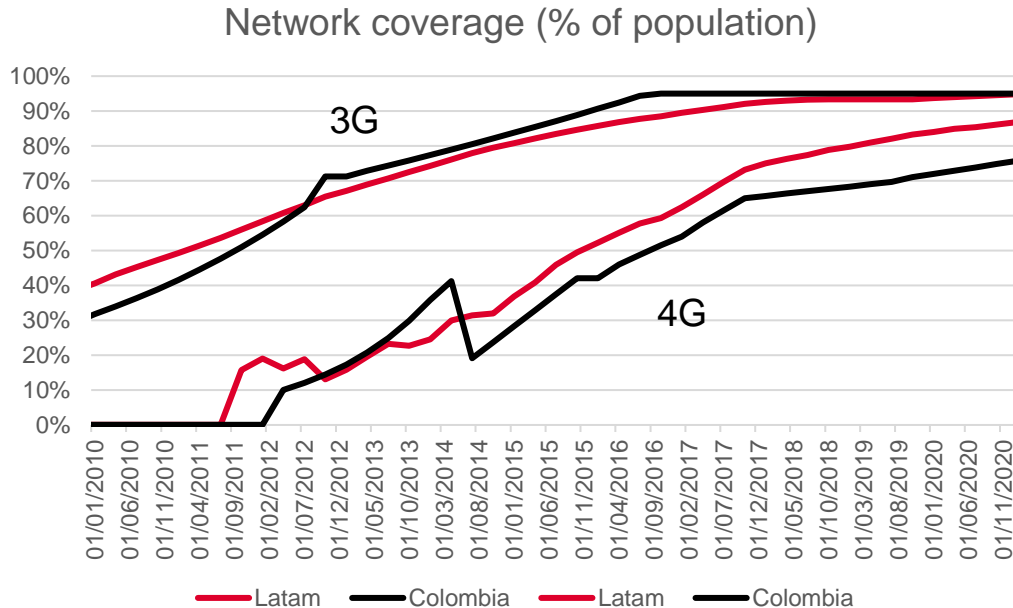
...leading to falling EBITDA per connection: EBITDA per connection in Colombia has generally been below the Latam benchmark, with the gap widening in recent years.

EBITDA per connection (historical USD)



- Colombia falls below the Latam average for Earnings Before Interest, Taxes, Depreciation, and Amortization (EBITDA) per connection (historical USD) from end-2015 onwards.
- EBITDA per connection is calculated using the average EBITDA per connection per operator with market share greater than 5%.
- We see a similar trend for EBITDA margins – Colombia falls below the Latam average in recent years.

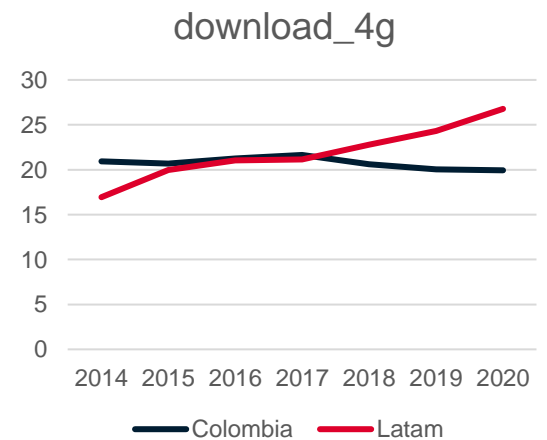
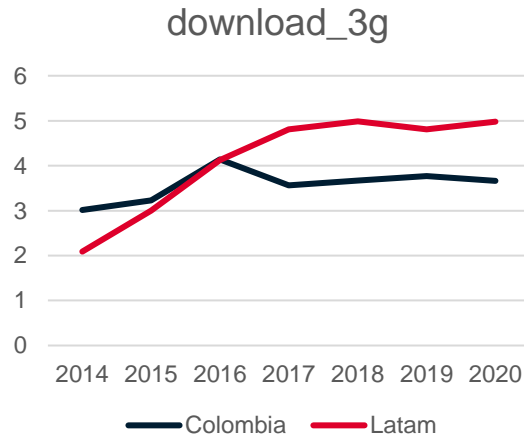
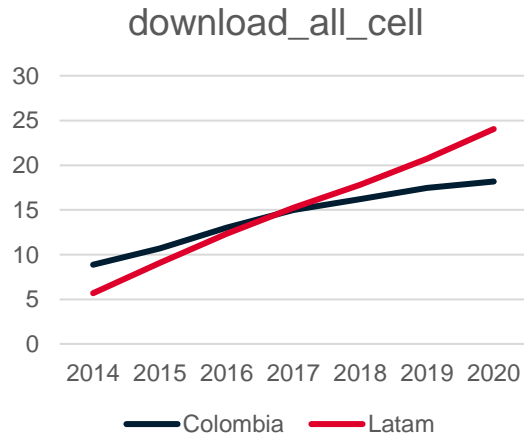
Potentially linked to slower roll out of 4G coverage in Colombia: Colombia was a leading country in 3G coverage as a percentage of the total market population in the Latam region, and until 2014 Colombia had more 4G population coverage than Latam, but has now fallen behind Latam and all reference groups apart from LMICs.



- Colombia falls below the Latam average for 4G network coverage (by population) from around 2014 onwards
- However, Colombia is doing fairly well in terms of 4G adoption compared to the Latam average.

...and lower network quality: Colombia was performing better than Latam for 3G and 4G download speeds up until 2016, and like network coverage, has now fallen behind on these metrics.

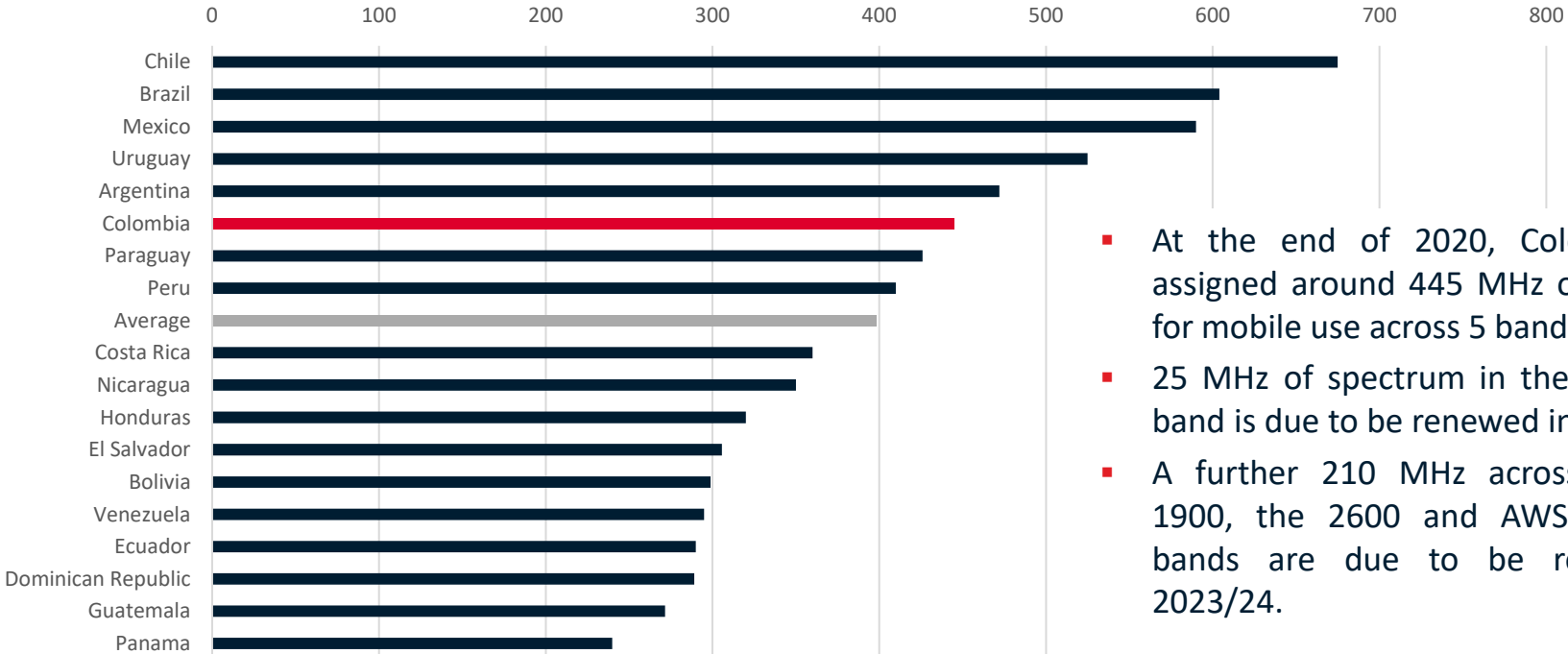
- Download speeds for all cell, 3G, and 4G fall below the Latam average from around 2016 onwards. This trend is similar when looking at Colombia compared to sample benchmarks of upper-middle income countries (the same income bracket as Colombia), low- and middle-income countries, and a global sample.



2. Spectrum price benchmarking

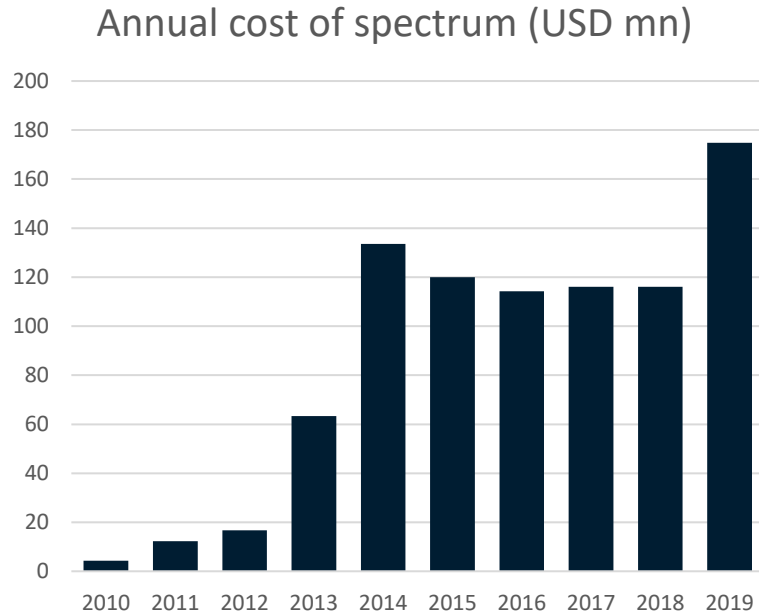
Mobile spectrum in Latin America

Total spectrum assigned to mobile (MHz)



- At the end of 2020, Colombia had assigned around 445 MHz of spectrum for mobile use across 5 bands.
- 25 MHz of spectrum in the 1900 MHz band is due to be renewed in late-2021.
- A further 210 MHz across the 850, 1900, the 2600 and AWS frequency bands are due to be renewed in 2023/24.

The cost of spectrum in Colombia



- The total cost of spectrum is made up of different components:
 - Initial payments and upfront costs (direct financial cost to operators for assignments and renewals)
 - Annual fees or charges on initial assignments or renewals (direct financial cost to operators usually proportionate to MHz held, or as a percentage of revenue)
 - Some licences impose additional obligations to operators. For example, indirect costs to operators such as quality of service requirements or geographical coverage obligations. If these obligations are not met, in some cases an operator is subject to a fine or the risk of losing the spectrum licence.
- In Colombia, especially for the cost of spectrum renewals, annual fees represent a growing proportion of the total cost of spectrum – just over 30% of annual costs in 2019).

Source: GSMA Intelligence. Costs are in nominal terms i.e. are not adjusted for inflation. Renewals fees are proportionate to revenue, and therefore decrease between 2014-2018. Costs shown here do not include indirect costs such as the cost of meeting coverage obligations.

Measuring the price of mobile spectrum

- All measures of the cost of spectrum in this study include both upfront costs (e.g. price paid at auction), and annual fees.

Measures:

\$PPP per year

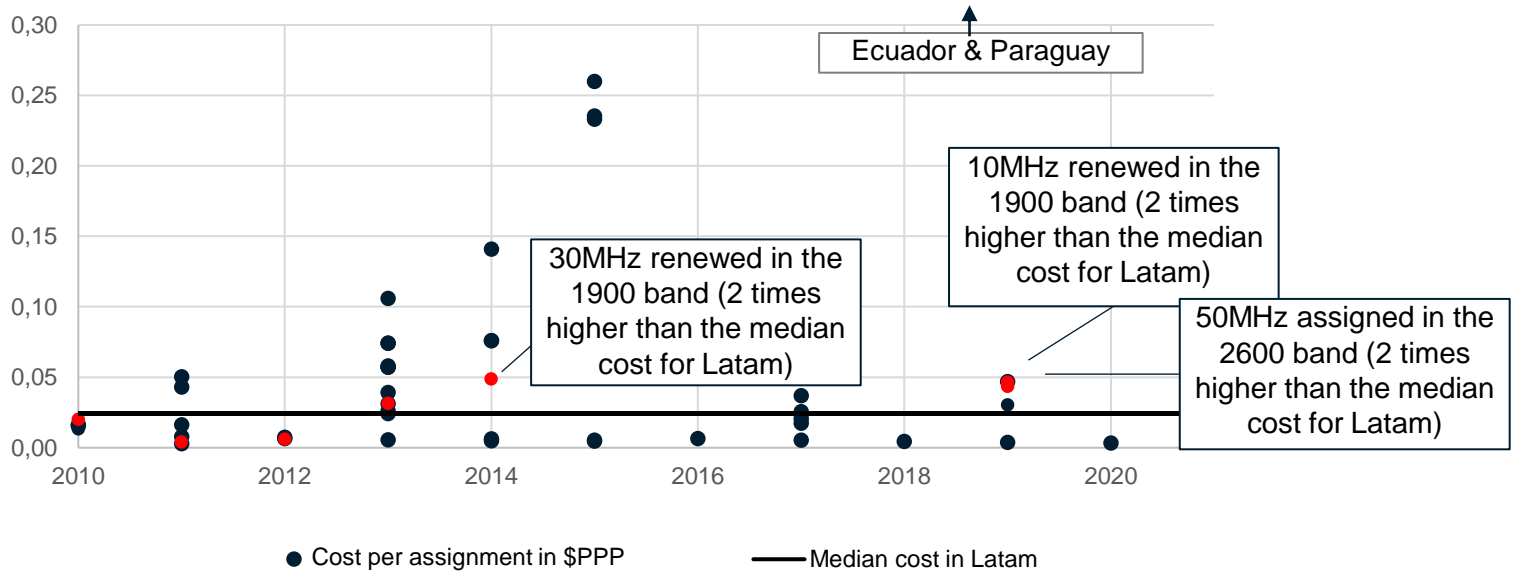
- The unit cost of spectrum per person (\$PPP per MHz per person per year) – this gives an indication of spectrum costs faced by operators to serve the potential customer base in a country during the spectrum licence period. This differs from other commonly used measures that do not take the licence length into account.

CPR

- The unit cost of spectrum as a percentage of revenues (CPR) or recurring revenues (CPRR) – this includes total revenue generated by operators over the relevant period, including both recurring and nonrecurring revenues. It gives an indication of the profitability or returns on spectrum costs as an investment. The higher the unit costs, the lower the rate of return made on the spectrum licence

Assignment costs per year in Colombia have been higher than the average in Latin America from 2014 onwards

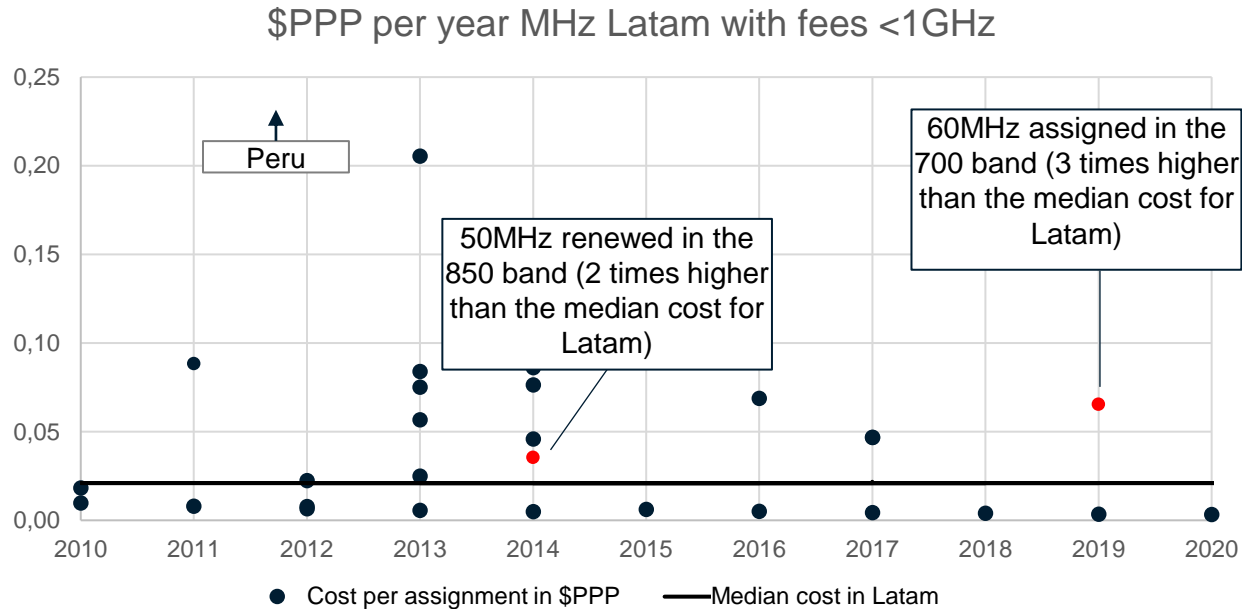
\$PPP per year MHz Latam with fees >1GHz



Assignments for Colombia highlighted in red

The cost of the assignment in 2014 represents the average annual \$PPP of the renewals in the 850 MHz and 1900 MHz bands which were priced together.

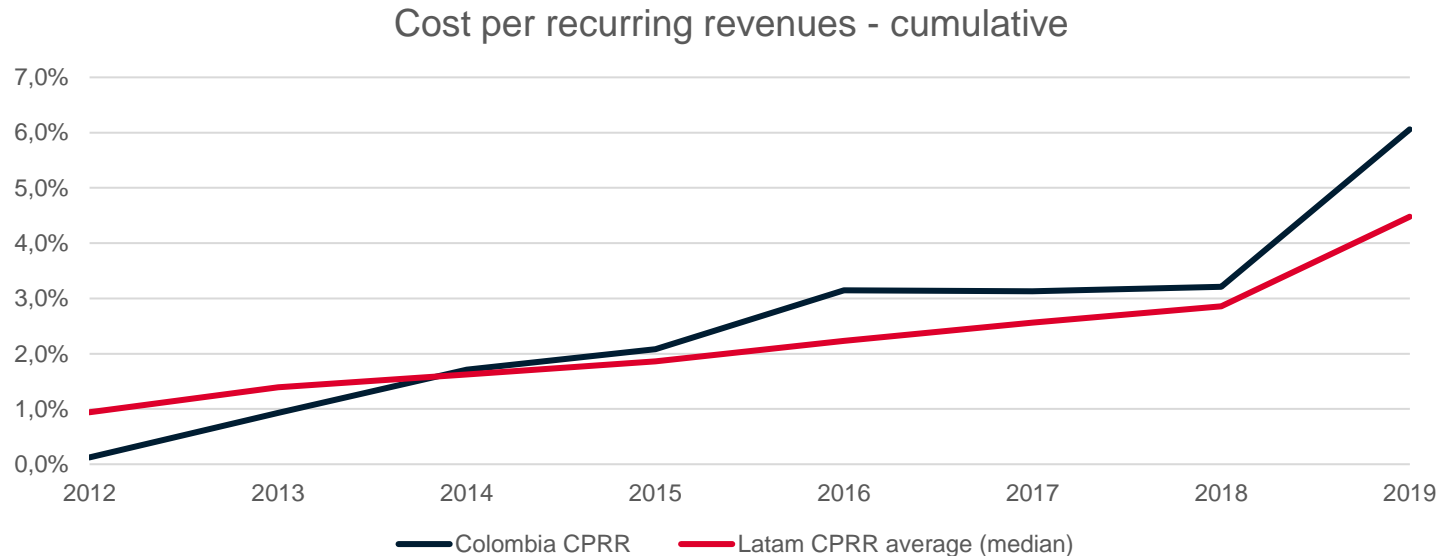
Assignment costs per year in Colombia have been higher than the average in Latin America from 2014 onwards



Assignments for Colombia highlighted in red

The cost of the assignment in 2014 represents the average annual \$PPP of the renewals in the 850 MHz and 1900 MHz bands which were priced together.

Price of mobile spectrum in Colombia: CPRR for Colombia has increased, and that, combined with low ARPUs, puts pressure on margins and reduces the capacity and incentive to invest in new generations. This might explain why coverage and quality have fallen behind other Latam countries.

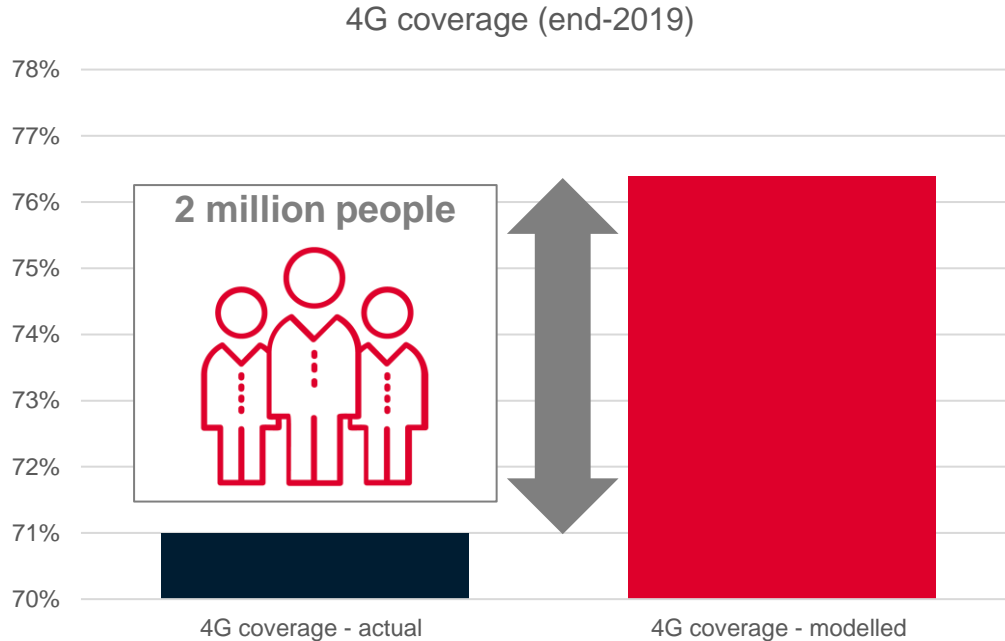


3. Impact of high spectrum prices in Colombia

Simulation applied to the Colombian market

- We have analysed how alternative spectrum prices would have impacted the historical development of the Colombian mobile market between (2014-2019). (*no speeds data from Ookla prior to 2014*)
- We focus on the impact on 4G coverage and download speeds. We do not consider the effect on consumer prices, since the global results in the economic study are not conclusive.
- To simulate the effects on the development of the mobile market (coverage and quality of service), we consider a scenario where the price of spectrum (CPRR) is in line with the level of the average price in Latin America.

Modelled 4G coverage in Colombia using Latam benchmark spectrum prices

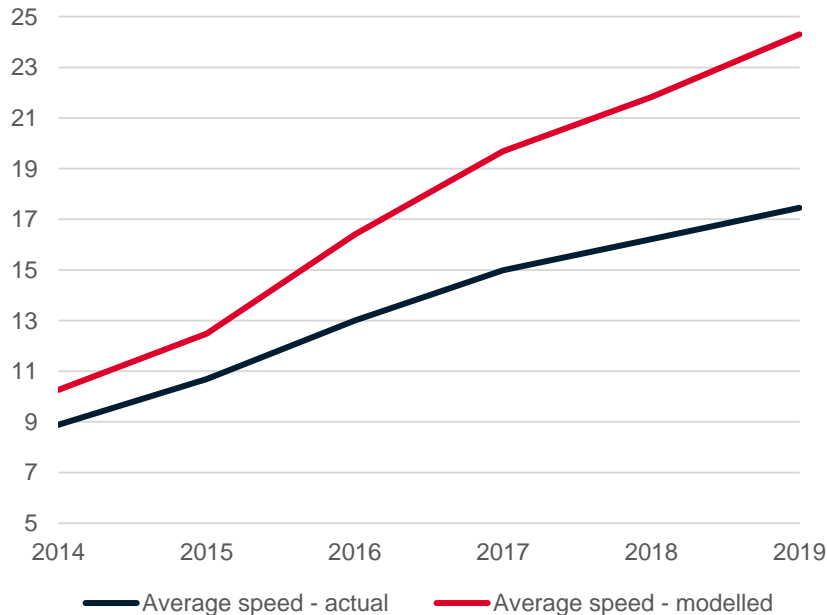


- This graph presents the 4G coverage in Colombia as a percentage of the market population.
- Based on the results of our simulation, lower spectrum costs would have increased the 4G coverage in Colombia from **71% to 76%** of the population by end-2019.
- This is equivalent to around **2 million additional people** with 4G network coverage in Colombia at the end of 2019.
- Or, that the higher prices caused a **2 year** delay in the roll-out of 4G network coverage.

Modelled download speeds in Colombia using Latam benchmark spectrum prices



Colombia - all download speeds (Mbps)



- This graph presents the average download speeds (all technologies) for operators in Colombia.
- Based on the results of our simulation, lower costs of spectrum would have increased speeds by around 4 Mbps for the average customer between 2014 and 2019, and by 7 Mbps by the end of 2019.
- This is equivalent to just around **40% faster download speeds** by the end of 2019.

4. Conclusions

The GSMA global study shows that spectrum prices:



Are not fully explained by supply and demand factors



Some governments prioritise goals such as higher collection of fees



This has repercussions for businesses and consumers



Less coverage



Lower speeds



More expensive services?

Conclusions

1

Lower ARPUs and reduced margins may have led to deteriorating investment conditions in Colombia since 2014.

2

This has had a negative impact on investments in 4G network and consumer outcomes (coverage and speeds).

3

High spectrum prices have further added to this issue by reducing margins further, and therefore the capacity and incentives to invest in new generations.

Conclusions

4

High spectrum prices are often the result of a deviation from best practice spectrum valuation. The valuation of spectrum should reflect the public policy objectives being pursued and the conditions of the market.

5

The Colombian Government approach to determine the price of upcoming spectrum renewals is not in line with best practice spectrum valuation methods as recommended by international organisations*. This could exacerbate the already challenging investment conditions in Colombia. The success of 5G in Colombia is therefore dependent on these spectrum pricing decisions.

** the currently proposed approach for spectrum licence renewals in Colombia is based on updating past spectrum values using mobile operators' WACCs as an adjustment factor. This is not in line with best practice spectrum valuation techniques as recommended by the ITU and other international organisations.*