BanRep Blog: Targeting, Price Discrimination, and High-Speed Internet Access

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Socio-economic strata are categories assigned to subdivisions of Colombian cities according to housing and environmental characteristics. They were established in 1994 to aid to cross-subsidize the price of utilities. At the time, they were considered an effective targeting alternative due to their easy application and their positive correlation with household income, for which good information is not always available. The strata are also used to exercise price discrimination, especially by companies whose services are not subject to the cross-subsidies regulation, such as Internet providers.

In an article published by the Journal of Industrial Economics, and whose preliminary version was published in 2020 in the Working Papers on Economics series, economist Juan Sebastián Vélez of Banco de la República (the Central Bank of Colombia) analyzes the welfare effects of stratification as an instrument for price discrimination by firms in the home Internet services market. The article shows that such price discrimination produces welfare gains for the poorest households and facilitates their access to high-speed Internet services.

The research is based on detailed information on all Internet plans offered in Colombia between 2013 and 2015. Using data on the number of subscribers, download and upload speeds, and other complementary characteristics of each plan, a supply-and-demand model for fixed Internet services was estimated. The model allows to assess the impact of different pricing regimes.

The data shows identical plans offered by the same provider, sold to different socio-economic strata in the same city at different prices. That is, Internet providers use the strata to exercise price discrimination. Under the observed pricing regime, households in the upper socio-economic strata are charged more for the same plan than households in the lower socio-economic strata. The estimated model allows computing an alternative scenario, where Internet providers charge a single price per plan to all households in the city, comparing it with the current scenario. Thus, the impact of the pricing regime on the households download speeds and economic welfare are evaluated.

Table 1 describes how the speeds to which consumers would subscribe under price discrimination and under uniform prices are distributed for each stratum. Under uniform prices, the subscription speeds for households in strata 1 and 2 are reduced by 0.5 Mbps and 0.25 Mbps, respectively. In addition, no household in stratum 1 would subscribe to the maximum speed plan (100 Mbps) offered. In contrast, households in strata 3 to 6 would purchase plans with higher speeds in the uniform pricing scenario, thus increasing the access gaps between households from upper and lower socio-economic strata.

Table 1: Distribution of Download Speeds by Stratum under Two Pricing Regimes

Download speeds in megabits per second (Mbps).
Baseline: equilibrium predicted by the estimated model under price discrimination.
Counterfactual: equilibrium predicted by the estimated model when operators charge uniform prices.

Download speeds under price discrimination (Baseline)					Download speeds under uniform prices (Counterfactual)	
Weighted average	Minimum	Median	Maximum	Weighted		

averageMinimumMedianMaximumStratum 11.84131001.361370Stratum 22.26141002.0214100Stratum 33.75151004.0115100Stratum 45.23151005.5815100Stratum 56.03151006.3115120Stratum 67.58151007.9415120

These differences by household in access to services of different quality are reflected in unequal impacts on welfare, which can be calculated with the estimated model. In particular, the model allows to calculate the value of the money transfers that would have to be made to each household to compensate it for moving from the current price regime to a uniform price regime that ignores the strata. This compensating variation calculated with the estimated model implies that eliminating strata would result in significant losses on average for the lower strata and significant gains for the upper strata.

To give an idea of the magnitudes, the calculations provided in the document show that, for example, an average household in stratum 1 in Pereira would need USD 1.6 per month to enjoy the same utility it enjoyed under price discrimination. On the other hand, a household in stratum 6 in Manizales would have to be deprived of USD 3 per month to enjoy the same utility it enjoyed under price discrimination. In general, it is observed that moving from current price discrimination to uniform prices would result in substantial transfers of economic welfare from lower to upper strata households.

Although the current stratification is an inaccurate system for classifying the socio-economic conditions of households, the study shows that price discrimination based on strata creates broader access to home Internet services and a positive effect on the welfare of the poorest households compared to the context of uniform prices. The mechanisms that produce these positive effects extend to other home services markets and suggest that more accurate household classification systems would allow for even greater efficiency gains and welfare increases for poorer households.

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