

Principles of Mobile Regulation with Application to Colombia

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Principles of Regulation

- Goal of regulation is to protect consumers and competition not individual competitors
- Consumer welfare should be the method of evaluation
- Both a short run aspect but also a long run aspect for consumer welfare since technology is rapidly changing in mobile
 - Regulation must let technology change as fast as possible
 - Regulation has often retarded the introduction of new technology
 - Example 1: introduction of computer switched fiber optic networks in the US
 - See: J. Hausman and E. Kohlberg, "The Evolution of the Central Office Switch Industry," in ed. S. Bradley and J. Hausman, Future Competition in Telecommunications, 1989
 - Example 2: fiber to the home in the US and UK
 - See: J. Hausman and G. Sidak, "Telecommunications Regulation: Current Approaches with the End in Sight," in N. Rose. ed., *Economic Regulation and Its Reform*, 2014
 - Regulators have no demonstrated ability to choose "winners" from new technology
 - Example 3: EU regulators choice to mandate GSM for 3G while CDMA turned out to be the winning technology

Guard Against Rent Seeking Behavior from Regulation

- Should be on guard against rent seeking by competitors to increase their profits which typically decreases consumer welfare
- Should be on guard against rent seeking by regulators: “It no fun to be a regulator unless you get to regulate”
 - Example 1: My academic research found that regulation led to approximately a ten year delay for introduction of cellular in US. Consumer welfare loss of over \$50 billion per year (in current \$ about \$250 billion per year).
 - See: J. Hausman, "Valuation and the Effect of Regulation on New Services in Telecommunications," *Brookings Papers on Economic Activity: Microeconomics*, 1997, 1-38
 - Example 2: My academic research found that price regulation in US (to favor virtual networks) led to 14% higher prices in 25 states which regulated prices
 - Largest effect in states which required prior approval to decrease prices
 - See: J. Hausman and G. Kuersteiner, “Difference in Difference Meets Generalized Least Squares: Higher Order Properties of Hypotheses Tests”, *Journal of Econometrics*, 144, 371-391, 2008

Competitive Analysis

- How to analyze competitive situation
- Should use prices using benchmark analysis since consumers pay prices and do not care about concentration indices (HHIs)
- Should also look at technology adoption, e.g. mobile internet, and usage
- HHI's are not useful for competitive analysis in mobile telephone
 - My research has demonstrated that for mobile prices that HHIs do not influence prices in the EU.
 - See: J. Hausman and G. Sidak, "Evaluation of Market Power Using a Competitive Benchmark Rather than the Herfindahl-Hirschman Index," Antitrust Law Journal, vol. 74(2), 387-408, 2007
 - My research has demonstrated that for mobile prices that HHIs do not influence prices in developing countries
 - J. Hausman and A. Ros, "An Econometric Assessment of Telecommunications Prices and Consumer Surplus in Mexico Using Panel Data", Journal of Regulatory Economics, 43, 2013.
- Easy for regulators to use HHIs but misleading.
- Prices are available from ITU and from BOAML
- Should also consider barriers to switching my consumers. A high churn rate demonstrates no barriers

Mobile Internet Regulation Principles

- Mobile data fundamentally different than mobile voice.
- It is important to recognize that no interaction exists among mobile networks in providing internet service.
- A given network interacts with its customers and internet backbone providers only.
- No call termination charges or other interactions exist among competing networks.
 - See J. Hausman, “From 2G to 3G: Wireless Competition for Internet-Related Services,” R. Crandall and J. Alleman ed., Broadband, Brookings, 2002.
- No country, so far as I know, prohibits bundling of mobile voice and data
- Bundling typically leads to lower consumer prices in this type of situation of imperfect competition (double marginalization)
- Bundling of Service and terminals has led to lower consumer prices
 - See J. Hausman, “Mobile Telephone,” in M. Cave et. al. eds, Handbook of Telecommunications Economics, North Holland, 2002
- Bundling of voice and data has also led to lower consumer prices

Asymmetric and Ex Ante Regulation Should Not be Used

- (1) Asymmetric regulation should not be used.
- Leads to higher prices for consumers because it decreases competition.
 - In US led to 14% higher mobile prices.
 - See J. Hausman and G. Kuersteiner, “Difference in Difference Meets Generalized Least Squares: Higher Order Properties of Hypotheses Tests”, *Journal of Econometrics*, 144, 371-391, 2008
- Only exception is when a new firm enters the market. Even in this case need to be careful
- OECD has adopted this principle in mobile regulation
 - For recommendation for Colombia see: **OECD Review of Telecommunication Policy and Regulation in Colombia**, 2014
- (2) Ex ante regulation should not be used
 - Market does a better job than regulators in determining best outcome
 - Example: in US in the 1990s spectrum discounts were given to “technology leaders”. Turned out to be a waste of money and led to significant fraud.
 - See J. Hausman, “Mobile Telephone,” in M. Cave et. al. eds, *Handbook of Telecommunications Economics*, North Holland, 2002.

Spectrum is the Most Important Factor for New Mobile Technology

- Most important consideration for mobile is spectrum
- 5G is likely to replace wireline internet and provide a massively connected network
 - “Internet of things” with a massively networked environment
- Now on advanced 4G can watch movies by accessing internet and watch entertainment/sports.
- Especially important in countries without well-developed wireline networks
- In many countries competitive problem remains in fiber access to the household because of only one provider, e.g. UK, Australia, and US in many locations
- Would required very large investment to introduce competition
- Next generation mobile can eliminate the problem if sufficient spectrum is available. Will have a competitive outcome.

Application to Colombia: Analysis of Price for Mobile Voice and Data

- Columbia mobile market has relatively low prices for both voice and data
- Colombia typically ranks among the lowest prices in South America for both mobile voice and mobile internet using ITU data.
 - Colombia has the second lowest mobile voice prices in South America and Colombia's mobile internet prices are below average.
 - Colombia has high mobile penetration. Above 100%.
 - Colombia has the highest usage (MOU) for mobile voice of any country in South America
 - 40% higher than South America Average.
 - High amount of churn. Comcel churn is about 50% per year.
- Colombia has among the highest download speeds for mobile internet in South America

Relative Prices of Colombia in South America (2014)

Relative prices of Colombia for South America	
Voice prepaid mobile (1)	2 of 8
Data prepaid plan 500 MB (2)	4 of 8
Prepaid Plan Data 1 GB (3)	2 of 8
Mobile voice as % of GNI (4)	4 of 9
Data postpaid 500 MB as % of GNI (5)	2 of 9
Data prepaid 500 MB as % of GNI (6)	5 of 9
1 GB Data postpaid as % of GNI (7)	2 of 9
Prepayment of data 1 GB as % of GNI (8)	1 of 9
Download speed of mobile telephony (9)	2 of 7
Sources:	Basis
(1) Study Fedesarrollo - FDS- (2015) Chart 7, p. 14	PPP
(2) Study FDS Chart 14, p. 22	PPP
(3) Study FDS Graph 17, p. 24	PPP
(4) Study ITU Table 4.2, p. 113	% of GNI
(5) Study ITU Table 4.5 p. 132	% of GNI
(6) Study ITU Table 4.6, p. 134	% of GNI
(7) Study ITU Table 4.7, p. 136	% of GNI
(8) Study ITU Table 4.8, p. 138	% of GNI
(9) Study FDS Chart 23, p. 28	Mbits/sec.

Price as a percentage of GNI

	Voice	Internet			
Sources: ITU Table					
	4.2	4.5	4.6	4.7	4.8
	Mobile	500MB Postpaid	500MB Prepayment	1GB Postpaid	1GB Prepayment
South America					
Average	3.40	2.72	3.22	3.60	6.22
Colombia	3.35	2.11	3.31	2.54	3.31
Colombia/Average	98.5%	77.5%	102.8%	70.6%	53.2%
Total Colombia/Average					76.3%

OECD in 2014 Came to Similar Conclusion on Prices

- The OECD, in the study of the telecommunications sector in Colombia in 2014, showed that:

"In mobile telephony, Colombia ranks better in relative terms compared with other Latin American countries such as Argentina, Brazil, Chile, Mexico, Peru and Uruguay. It is generally among the three least expensive countries within that group (the least expensive for 30 calls and 400 SMS basket)." (p. 33)

"Colombia ranks third or fourth place out of seven Latin American countries in mobile broadband services for smartphone baskets (bundled with calls). Also, it ranks among the less expensive for half of the basket of mobile broadband for laptops and tablets ..." (p. 35)

No Carrier has Market Power

- Market power is typically defined as the ability to keep prices above the competitive level.
- Benchmark analysis demonstrates neither Comcel nor other carriers have market power.
 - Mobile prices are relatively low compared to South America
 - Mobile internet prices are average and download speeds are high
- Markets are performing competitively with relative high churn rates
- Thus, no reason for “dominance regulation”
- In South American there is an inverse relationship between HHI and prices, e.g. a lower HHI leads to higher prices

Asymmetric Regulation is Misguided Regulatory Policy

- Has led to rent seeking outcome for Tigo and Telefonica
- Neither company is a new entrant.
- Both companies have significant market share, and both companies have large corporate parents.
 - Telefonica is largest provider in 5 Latin American (LA) countries, Tigo is largest in 4 LA countries, and America Movil (Comcel) is largest in 4 LA countries
- OECD recommended in 2014 that Colombia end asymmetric regulation favoring Tigo and Telefonica.
 - See: **OECD Review of Telecommunication Policy and Regulation in Colombia, 2014**

“To sum up, asymmetric termination charges not only distort the way in which operators compete (without economic justification) but also increase the regulatory burden (e.g., the need to establish a monitoring system). Such a system, along with asymmetric charges, should be eliminated, to allow operators to compete as they wish” (p. 71)

Restrictions on Bundling Voice and Data would be a Misguided Regulatory Policy

- Bundling leads to lower prices in this type of situation.
 - Double marginalization leads to lower prices
- Bundling has led to lower prices for mobile customers and faster adoption of new technologies.
 - See: J. Hausman, “Mobile Telephone,” in M. Cave et. al. eds, Handbook of Telecommunications Economics, North Holland, 2002.
- Any consumer can change sim cards for mobile internet and use company which offers the best deal.
- Mobile internet has not externality with competitors
- No other country restricts bundling of voice and data

Spectrum Allocation should be done by Auction, Not by Regulatory Fiat or Political Favors as Soon as Possible

- Been demonstrated numerous times that spectrum auctions lead to best outcomes
 - See e.g. J. Hausman, “Mobile Telephone,” in M. Cave et. al. eds, Handbook of Telecommunications Economics, North Holland, 2002.
- In Colombia incumbent providers are well-financed and each of the 4 providers can bid for spectrum in a well-run auction
- Government interference has slowed down technology adoption.
 - 4G mobile penetration is relatively low in Colombia
- 5G will be very important.
- Regulatory uncertainty has a large negative effect on mobile investment because of sunk cost feature
 - See J. Hausman and G. Sidak, “Telecommunications Regulation: Current Approaches with the End in Sight,” (in N. Rose. ed., *Economic Regulation and Its Reform*, 2014
- Government should prepare now to hold spectrum auction without interference.
- Sufficient spectrum should exist for current competitors and perhaps new entrants to purchase spectrum and construct advanced 4G and 5G networks.
- Network investment will be key to future technological advance