

Policy results: What worked and did not work in Latin America

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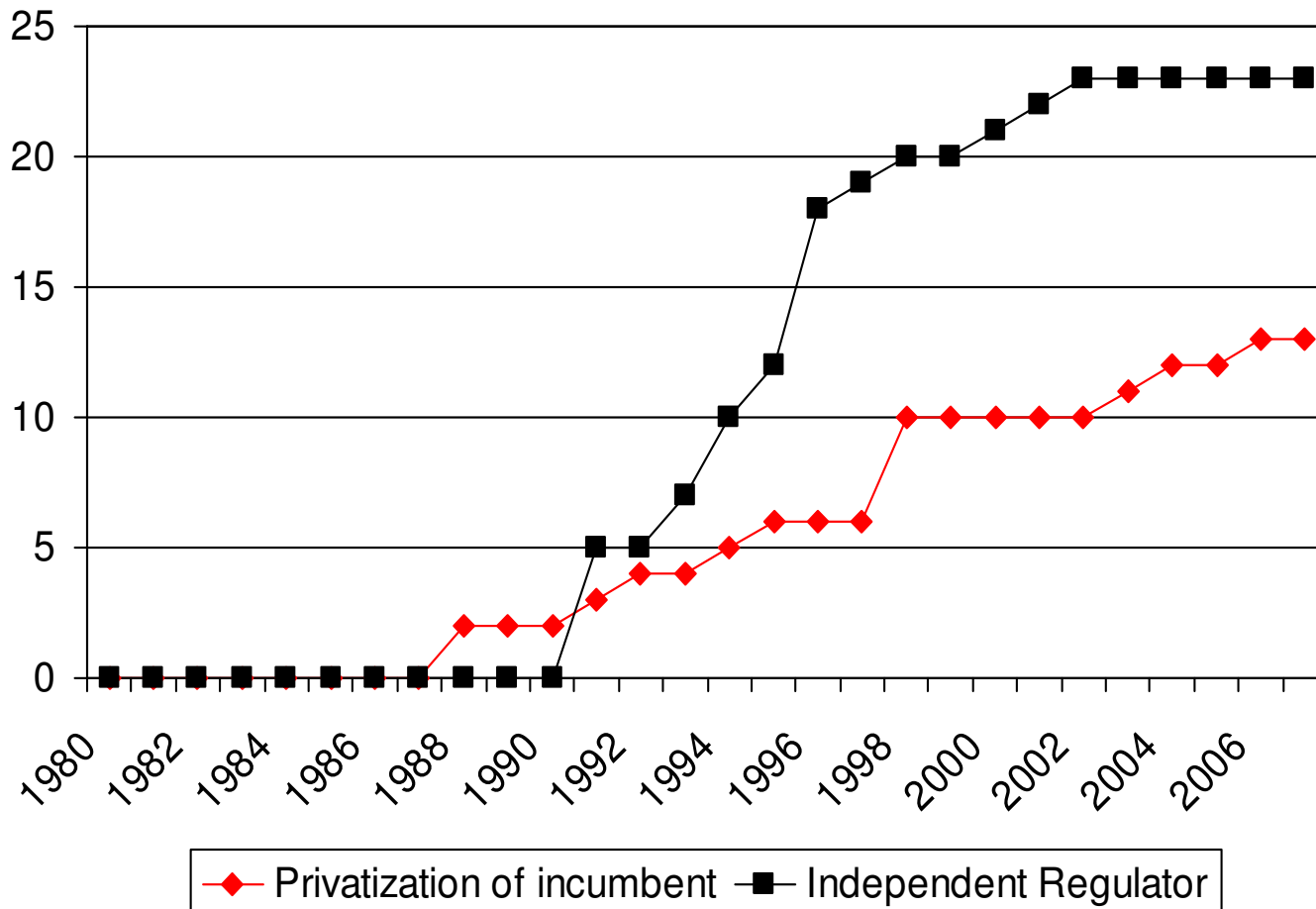
(*) The author would like to acknowledge Dr. Ernesto Flores and Prof. Judith Mariscal for the collaboration that led to a section of this presentation

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- 1. Policy diffusion in Latin America**
- 2. What is working: competition and innovation in mobile services**
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Telecommunications policy adoption in Latin America followed a conventional diffusion process

DIFFUSION OF REGULATORY INITIATIVES IN LATIN AMERICA



Despite the (re) nationalization of CANTV (Venezuela) and Entel (Bolivia), and the reluctance of Uruguay and Ecuador to privatize their incumbent

Source: Katz (2009)

Three variables help understand the privatization and liberalization policy diffusion process

VARIABLES	TYPOLOGY
DIFFUSION PATTERN	<ul style="list-style-type: none"> •Geographic proximity (similar problems and conditions, “copy your neighbor”) •Lateral diffusion (among countries sharing common socio-economic and cultural circumstances) •Hierarchical diffusion (from advanced countries to developing ones)
ROLE OF COUNTRIES	<ul style="list-style-type: none"> •Instigators (leaders and radicals) •Followers (moderates and indecisive) •Laggards (conservatives, “snobs”)
ROLE OF INSTITUTIONS	<ul style="list-style-type: none"> •Supra-national (ITU, World Bank) •Policy entrepreneurs (consulting and law firms, academics, i-banks) •Community networks (ERG, Regulatel, etc.)

Herd behavior in regulatory policy transfer exhibits some common features

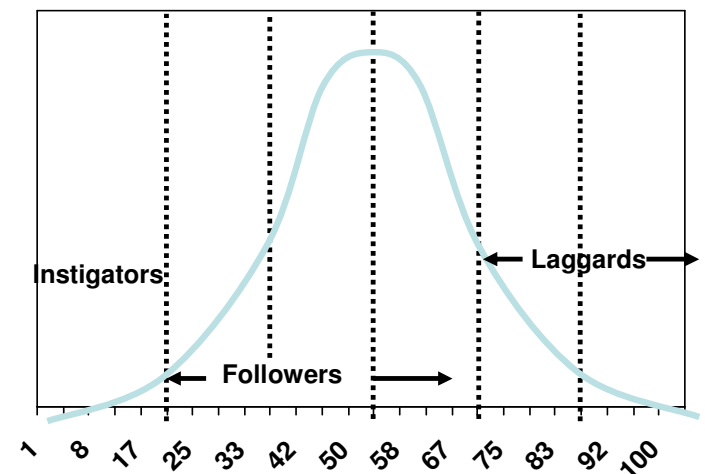
- Similar decisions (e.g. Privatize the state-owned wireline carrier) are made by different countries in a very short period of time
- One or more incentives for imitative behavior can be identified
 - Reduction of uncertainty: the more countries adopt a policy, the higher the value of example
 - Promote reputation: adoption of a certain policy is likely to increase political acceptance
 - Cost of information: herding allows to short-cut the analytical work leading to the formulation of a regulatory model
 - Learning from opinion leaders: public revelation from leaders that are outside the country of decision maker increases legitimacy of decision
- A mechanism of contagion from country to country is identifiable
- Payoffs and/or preferences for policy change will rise with an increase in the number of countries or in-country policy makers who decide to opt for the policy change

ROLE OF INDIVIDUAL COUNTRIES

Three types of countries can be identified in the process of diffusion of a regulatory model

- Instigators: countries that do not require prior models to begin a process of change of a regulatory model
 - Leaders: countries whose adoption of a regulatory model is both at the forefront of policy changes and is closely observed as a major source for imitation and legitimacy
 - Radicals: countries that are “first movers” in regulatory changes, but whose example is discounted by other policy makers (e.g. Model cannot be transferred because experience is not applicable or not a source of legitimacy)
- Followers: countries that are risk averse and conform to collective norms
 - Moderates: countries whose policy makers take a pragmatic rather than an ideological approach to regulatory model development
 - Fence-sitters: countries that lack the internal preferences and policy capacities that allow the moderates to maximize benefits
- Laggards: countries that require the highest number of adopters of a regulatory model before they change
 - Foot-draggers: countries that have a similar incentive structure as followers but lack minimal policy capacities or political will
 - Snobs: countries that tend to reject prevalent regulatory models on the grounds that they have better models

HERD BEHAVIOR AND ADOPTING POPULATION



The % of Other Required Before a Positive Decision to Adopt The Regulatory Model is Made

Source: Levi-Faur (2004)

ROLE OF INDIVIDUAL COUNTRIES

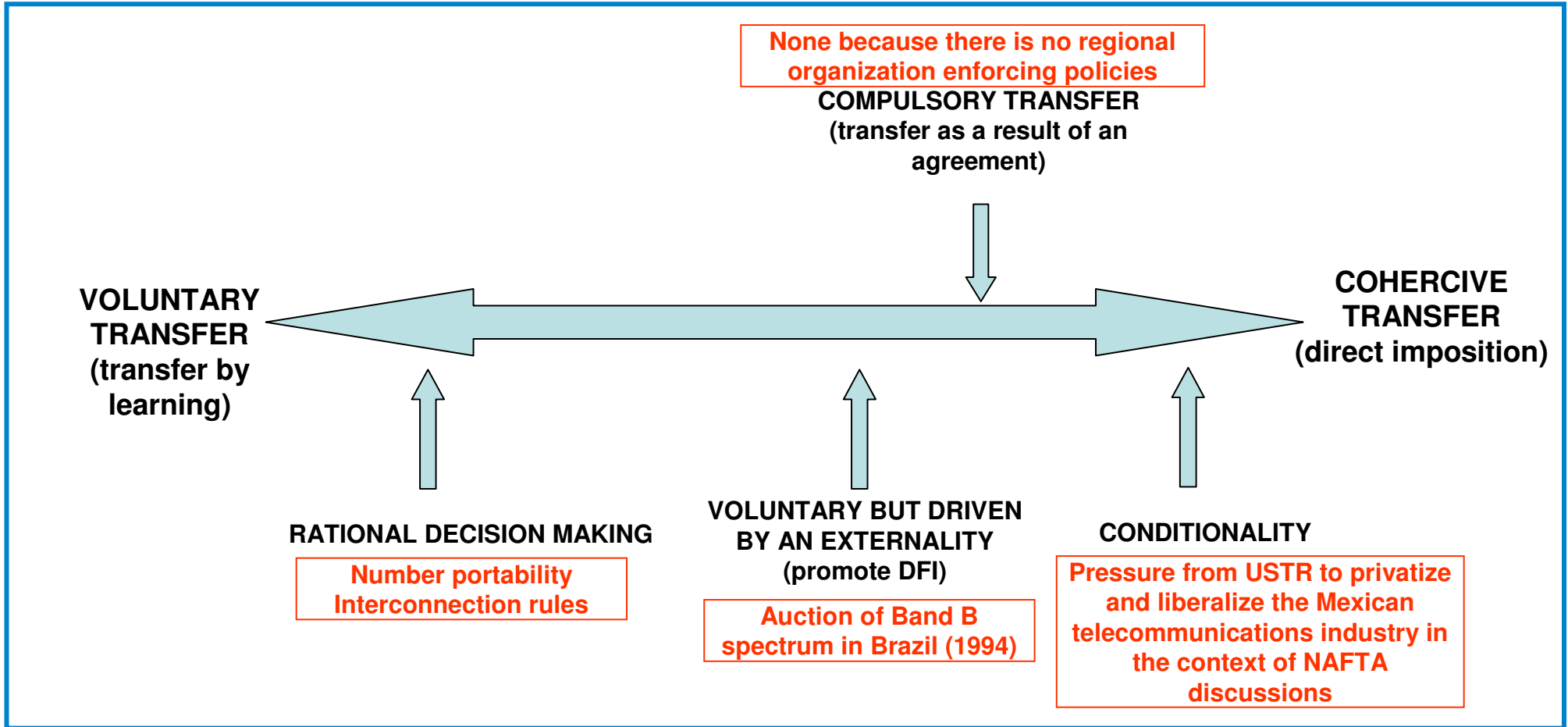
Latin American countries play different roles in the process of regulatory model diffusion

Diffusion Role	Difussion Types	Latin America
Instigators	Leaders	Chile
	Radicals	Venezuela
Followers	Moderates	Brazil, Argentina
	Fence-sitters	Peru, El Salvador
Laggards	Foot-draggers	Mexico, Ecuador
	Snobs	Costa Rica Uruguay

ROLE OF INSTITUTIONS

The institutional role in the diffusion process has followed several models

INSTITUTIONAL ROLES IN THE TRANSFER OF PUBLIC POLICIES



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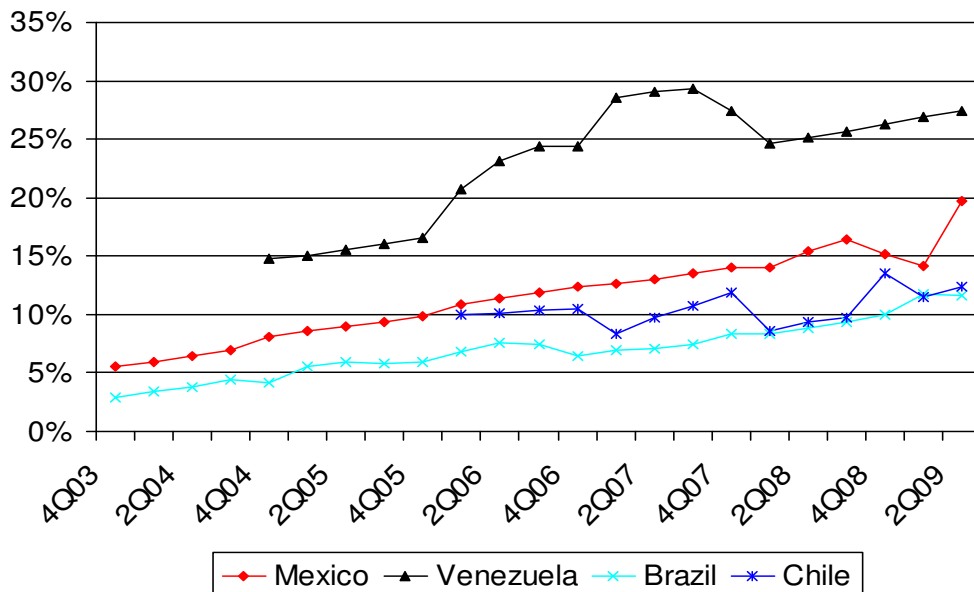
Latin America appears to be fairly advanced with regards to adoption of wireless and diffusion of data services

	Wireless penetration	Data services as a percent of ARPU
North America	89 %	27 %
Western Europe	129 %	24 %
Industrialized Asia	96 %	42 %
Eastern Europe	94 %	17 %
Asia Pacific	51 %	23 %
Africa and Middle East	44 %	...
Latin America	87 %	16 %
• Argentina	126.8 %	27.0 %
• Brazil	90.6 %	11.6 %
• Colombia	83.9 %	5.0 %
• Mexico	79.4 %	19.7 %
• Uruguay	109.4 %	25.0 %
• Venezuela	104.5 %	27.4 %

Sources: ITU; Wireless Intelligence; Merrill Lynch

Adoption of data services has been consistently growing across the region driven by home-grown applications and services

MOBILE DATA AS A PERCENTAGE OF SERVICE REVENUES (2003-2009)



Source: Merrill Lynch; analysis by the author

DRIVERS OF MOBILE DATA GROWTH

- **Mobile advertising:** in Brazil represents 2% of all ad spend but growing exponentially to reach \$400 million in 3 years
- **Content:** the Brazilian mobile media market is worth \$ 947 million, with music and graphics representing a large portion
- **Social networking:** Orkut, a Brazilian based social network has 54 million active users and growing at 20% Y-T-Y; Hi5, a Latam-based network has 47 million active users

What have been the elements of the policy and regulatory framework that have fostered this development?

Policy Variables

Institutional Framework

- Regulatory autonomy
- Privatization

Regulatory Framework

- Market entry
- Price
- Asymmetry

Non-sector specific policies

- FDI restrictions
- Convergence restrictions

Sector Performance Metrics

Performance

- Output and profit
- Investment

Innovation

- Product variety
- Feature functionality
- Service quality

Adoption

- Service adoption
- Prices

What is the impact of regulation and policy variables on the sector rate of innovation?

The following model evaluates the impact of policy and regulatory variables on the rate of adoption of mobile internet

$$T = f(M, P, S)$$

FACTORS	VARIABLES	HYPOTHESES
M	<ul style="list-style-type: none"> Comprises variables such as market structure (degree of market consolidation and competitive intensity) 	<ul style="list-style-type: none"> A competitive telecommunications market fosters the development of products and services in order to generate sufficient differentiation
P	<ul style="list-style-type: none"> Contains variables such as regulatory policies, existence of an independent regulatory authority and restrictions or lack thereof to direct foreign investment 	<ul style="list-style-type: none"> Certain sector and non-sector specific policies represent an incentive to innovate <ul style="list-style-type: none"> – Policies oriented toward reducing customer switching costs (e.g. number portability) will stimulate innovation in order to preserve loyalty – A regulator perceived as not being sufficiently independent from the government will reduce the incentive to innovate because a successful differentiation strategy could lead to asymmetric pressures (e.g. renegotiate licenses, artificially set price caps) – Sector restrictions to FDI could result in limited willingness to innovate
S	<ul style="list-style-type: none"> Includes variables such as income level, size of target market to which the product is addressed and degree of urbanization 	<ul style="list-style-type: none"> Policy framework notwithstanding, companies will invest in markets with higher demand profile; this is therefore, a control variable

The model evaluates the impact of policy factors on the percentage of revenues of the wireless industry derived from data services

$$REVBAMit = g (Mit, Pit, Sit)$$

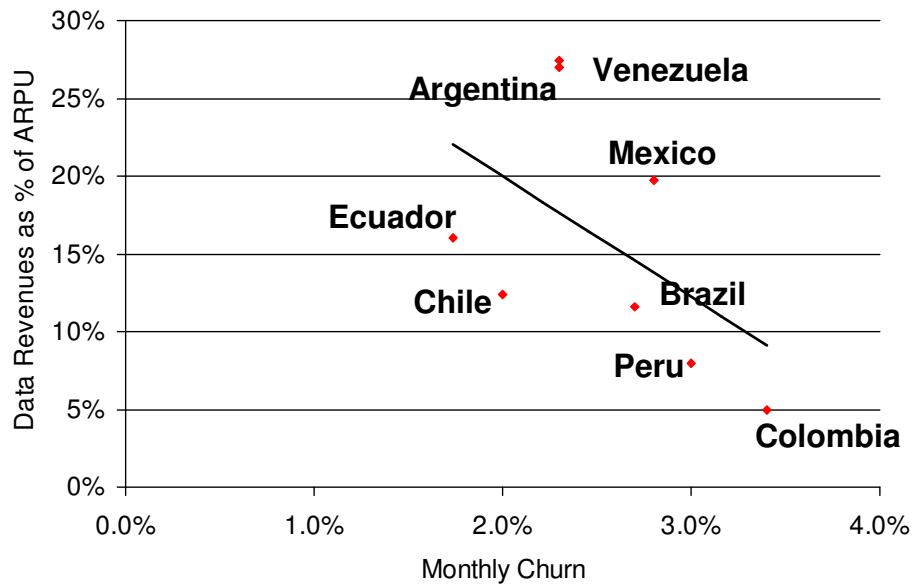
Factor	Name	Description	Source	Mean	Std	Min	Max	ObsN	Obs
Innovation	REVBAMit	• Percentage of revenues derived from mobile broadband	Merrill Lynch (2005-2009)	0.14	0.078	0.0125	0.4653	293	45
Market structure	HHit	• HERFINDAHL-HIRSCHMAN INDEX	Calculated based on Merrill Lynch	3904.289	1858.122	1656	15761	356	52
	CHURNit	• Percentage churn	Merrill Lynch	0.022	0.013	0.003	0.122	323	48
Policies and regulation	IDMCit	• Regulatory independence	Calculated based on ITU	2.12	1.14	0	3	371	53
	MNPit	• Mobile number portability	ITU	0.464280	0.4994	0	1	364	52
	NMPYit	• MNP years enacted	ITU	1.5247	2.3895	0	11	364	52
	OWNCAPit	• Foreign ownership of mobile operator	ITU	0.9650	0.1295	0.4	1	371	53
Socio - Demographic	GDPit	• GDP per capita (US\$ PPP)	IMF	19,878.4	13618.4	925.61	53450.7	368	53
	EFlit	• Index of Economic Freedom	Heritage Foundation	65.52	10.57699	39.9	90	364	53
	URBAN	• Urbanization Index	World Bank	69.72106	18.043	24.44	100	357	51
	POPit	• Percentage population between 15 and 64	World Bank	66.1793	3.5921	53.47	74.89	357	51

Model results indicate that sector innovation is directly linked to a certain level of market concentration and the threat of policies that could lead to higher competitive intensity

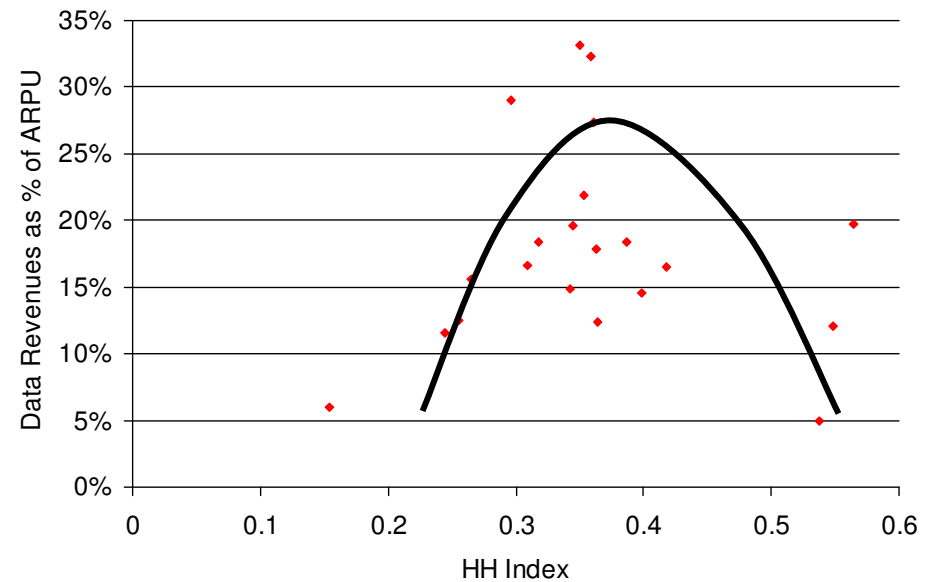
- **Market concentration is directly linked to innovation:** consolidation provides operators with a higher certainty of potential returns to invest in wireless data development
- **Churn level is indirectly linked to wireless development:** the higher the level of competitive intensity, the lower the incentive of operators to innovate
- **Mobile number portability and years of policy enactment is directly linked to innovation:** portability does not necessary lead to churn but the threat of churn provides an incentive for operators to innovate in products in order to build loyalty
- **Regulatory independence and innovation are not significantly linked:** in the mobile market, the market is driving innovation and therefore, the degree of regulatory independence is not an important variable in explaining new product development
- **All socio-demographic variables are directly and significantly linked to innovation:** market potential is a critical variable driving innovation

In sum, there appears to be an optimal level of competitive intensity beyond which, the incentive to invest and deploy wireless broadband services diminishes

Latin America: Monthly Churn vs. data revenues



Market Concentration vs. data revenues



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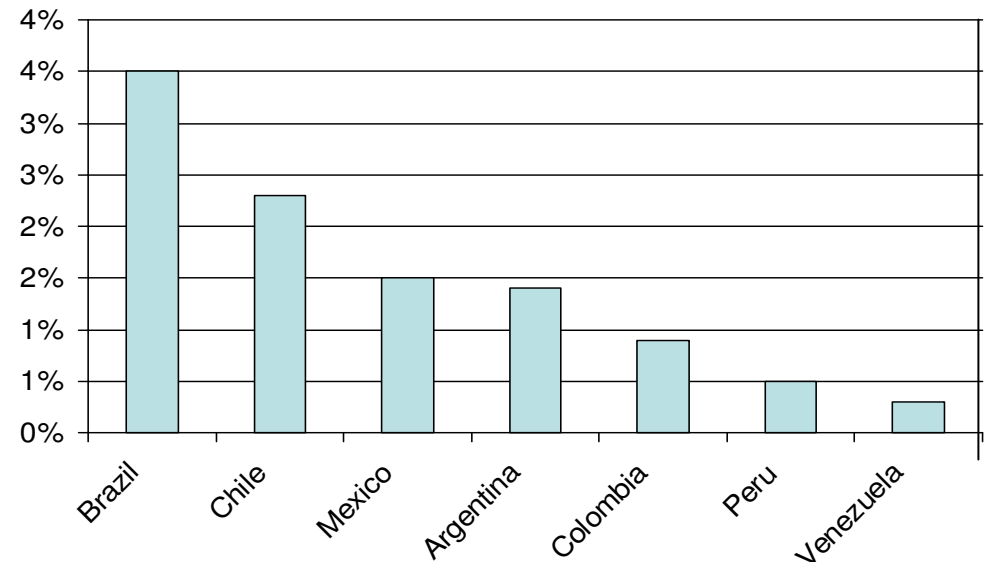
The future demand for broadband in Latin America is going to be met largely by wireless technology; however, development is still embryonic

BROADBAND PENETRATION (2009)

Country	Household Penetration	Population penetration
Argentina	29.27 %	10.0 %
Brazil	18.88 %	5.93 %
Chile	30.84 %	9.8 %
Colombia	16.41 %	4.28 %
Mexico	28.31 %	7.05 %
Venezuela	17.61 %	7.22 %

Source: ITU; Euromonitor; World Bank; TAS analysis

3G PHONE SUBSCRIBERS AS A PERCENTAGE OF ALL SUBS (2009)



Source: BMI; analysis by the author

Taxation is becoming an obstacle to promoting wireless broadband diffusion

		Service taxation			
		Universalization of service	Direct taxation without sector discrimination	Direct taxation and sector specific taxes	Service tax revenue maximization
Handset taxation	Sector discrimination based on moderate import duty and telecom tax		South Africa , Colombia	Mexico	Tanzania
	Sector discrimination based on high import duty but no telecom tax	China		Argentina	Venezuela
	Sector discrimination based on high VAT and import duty but low handset specific tax	Yemen			Turkey
	Handset tax revenue maximization			Brazil	Bangladesh

Universalization and protectionism

Protectionism

Sector distortion

Tax maximization and sector distortion

In Latin America, large countries tend to follow sector distortion taxation approaches

Taxation Approaches	Key Countries
Universalization and Protectionism	Paraguay
Protectionism	Bolivia, Chile, Colombia, Guatemala, Nicaragua, Peru
Sector Distortion	Dominican Rep., Ecuador, Mexico
Tax maximization and sector distortion	Argentina, Brazil, Venezuela

In some Latin American countries, the impact of taxes on total cost of ownership can be fairly high

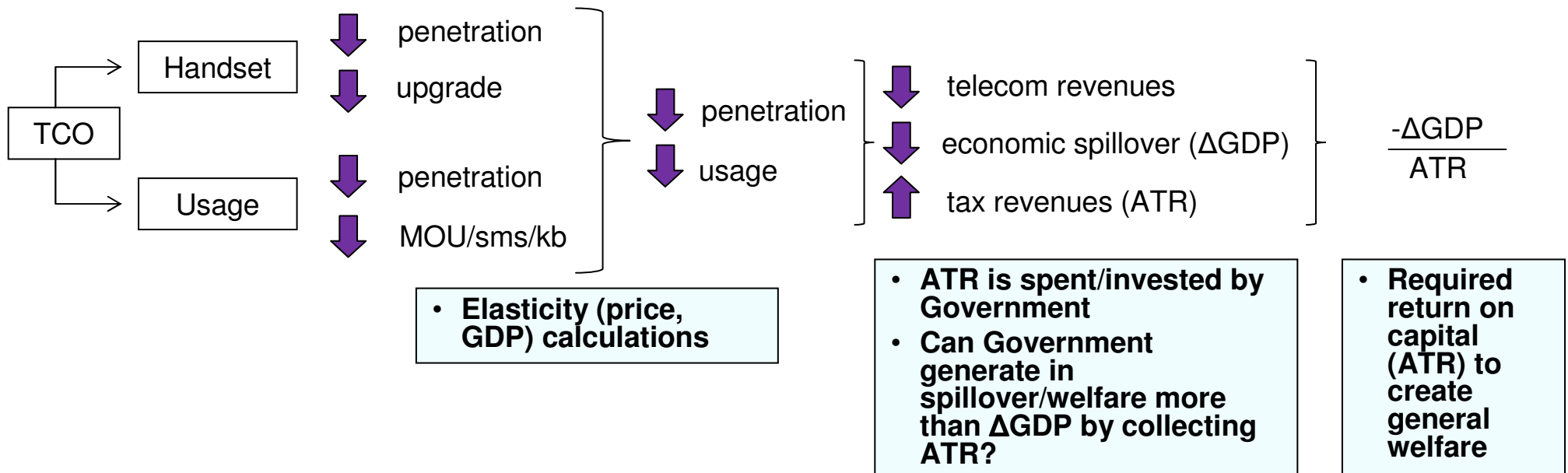
TAXATION APPROACHES TO MOBILE SERVICES

Country	Services			Handset				Taxation approach
	VAT	Other taxes	Fixed Taxes	VAT	Customs duty	Other taxes	Fixed Taxes	
Chile	19 %	---	---	19 %	6 %	---	---	Protectionism
Mexico	16 %	3 %	---	16 %	0.10 %	---	---	Sector distortion
Venezuela	14 %	---	\$ 1.56-6.25	14 %	14 %	---	---	Tax maximization and sector distortion
Brazil	18 %	3.70 %	---	18 %	16 %	9.30 %	\$ 13.35	
Argentina	21 %	4 %	---	21 %	20 %	---	---	

Source: Deloitte (2008); updates by the author

We have evaluated how taxation could impact wireless broadband penetration and, ultimately, economic growth

OVERALL IMPACT ON ECONOMIC WELFARE (GDP)



To estimate the economic impact of broadband, a model based on 24 Latin/Caribbean countries was constructed: 10% increase in broadband penetration yields a 0.17 percentage point contribution to GDP growth

$$\text{Avg GDP growth (04-08)} = \beta_1 * \text{Per Capita GDP 2000} + \beta_2 * (\text{Investment/GDP})_{04-08} + \beta_3 * \text{Tertiary Education} + \beta_4 * (\Delta \text{ broadband penetr.})_{03-04}$$

	Coefficient	Standard error	T-statistic	P>[t]	95 % conf.
GDP per capita 2000	-.0006045	.0002142	-2.82	0.011	-.0010528
Investment/GDP	-0.0006496	0.108927	-0.01	0.995	-.2286365
Tertiary education	0.1900042	0.0670932	2.83	0.011	.0495766
Broadband penetration	0.0177989	0.0061606	2.89	0.009	.0049046
Constant	7.989611	4.063328	1.97	0.064	-.5150321

Control variables

Number of observations = 24
 F(4, 19) = 14.34
 Prob> F = 0.0000
 R2 = 0.4311
 Root MSE = 4.7802

For every dollar that taxes are reduced over a 5 year period, 1.2 to 6.9 dollars will be created in additional GDP

MEXICO: EFFECT OF LOWERING TAXES ON TCO FROM THE CURRENT 18.4% TO 6.1% (2010-2014)

Effect	Accumulated 2010-2014
Increase in the number of subscribers	24%-32%
Accumulated GDP creation	\$ 1.6 - \$ 8.6 billion
Total tax loss	\$ 1.2 - \$ 1.3 billion

Source: TAS analysis

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Policy implications for Latin America

- **Regulators should be careful in proceeding to adopt policies through imitation and copying of unsuited approaches**
- **Not all telecommunications competition models are equally powerful in stimulating investment and innovation**
 - There appears to be an optimal level of competitive intensity beyond which, the incentive to invest and deploy wireless broadband services diminishes
 - That optimal level for deployment of wireless broadband is driven by a certain amount of market concentration and a moderate level of competitive intensity
 - The higher market concentration is, the larger the incentive to innovate. This could be associated to both the certainty of obtaining a return to the introduction of a new product (wireless data products) and the ability to capture a larger share of demand (Brazil, Chile)
 - Conversely, highly consolidated sectors lack enough competitive incentives to innovate and yield consumer welfare (Mexico)
- **There is a need to align taxation policies with sector-wide objectives**
 - Several countries have policies to foster ICT growth while taxation policies tend to hinder that objective
 - Distortion approaches have a negative impact on adoption and consequently impact on economic growth

APPENDIX

Data for model estimation comprised information for 53 countries between 2002 and 2008

- The source of the dependent variable (percent of revenues derived from mobile data) is the Merrill Lynch Mobile Matrix, which was used as a proxy of level of innovation in a given market
- To control for effects produced by market structure, two variables extracted from the same source were considered
 - HERFINDAHL-HIRSCHMAN INDEX testing the relevance of industry structure in driving level of innovation
 - Churn assuming that if clients switch from company to company frequently, it would be difficult for the carrier to generate a constant income per customer, thereby reducing the incentive to deploy new services
- Three regulatory variables were considered
 - Regulatory Independence: The premise to include this variable is that an independent regulator would give confidence to investors when deploying new services. The source of this variable is the ITU Regulatory Database
 - Mobile number portability (MNP) and the year that MNP has been in place: Our theory is that MNP reduces the switching costs henceforth reduces the availability of mobile operators to get a long term revenues per user. We use the years of implementation of this regulation to control for markets where this policy has recently been introduced where an effect would be difficult to observe. The source of this information is the ITU Regulatory database
 - Restriction to foreign direct investment in mobile operators: The objective is to test if limiting the level of FDI in the mobile market has delayed the introduction of new services. The source of this information is the ITU regulatory database
- Four control variables were included:
 - GDP per capita, as a measure of how attractive is a market. This information is collected from the IMF
 - Index of Economic Freedom trying to test whether countries that favor creation of new business, international trade, FDI, corruption reduction will result in better environments for the creation of new services
 - Urban Population, assuming that it is less expensive for companies to deploy services in more dense populated cities. Usually this type of sites are reflected in urban center. The source of this information is the WDI
 - Population between 15 to 64: This is the target market for mobile services of this characteristics. The source of this information is the WDI

Innovation model results

Revd _{it}	Coef	Std. Err	P > t
LHHI _{it}	0.75072	0.25299	0.003**
LChurn _{it}	-0.13932	0.07918	0.08*
MNP _{it}	0.14598	0.07069	0.04**
NMPY _{it}	0.59135	0.01799	0.001***
LGDP _{it}	1.30146	0.34303	0.000***
LEFI _{it}	-0.79714	0.67104	0.236
LUrban _{it}	5.55978	1.75629	0.002**
LPOP _{it}	7.14044	3.73842	0.057*
IDMC _{it}	0.06122	0.04178	0.144
Cons	-72.10414	15.70399	0.000***
Sample		272	
Periods		7	
Observations		42	
R ²	0.624		
F-test (9,221)	40.75	(0.0000)	
Heteroscedasticity:	110000	(0.0000)	
Wald χ^2 (42)			