

Competition and crisis in Latin American telecommunications

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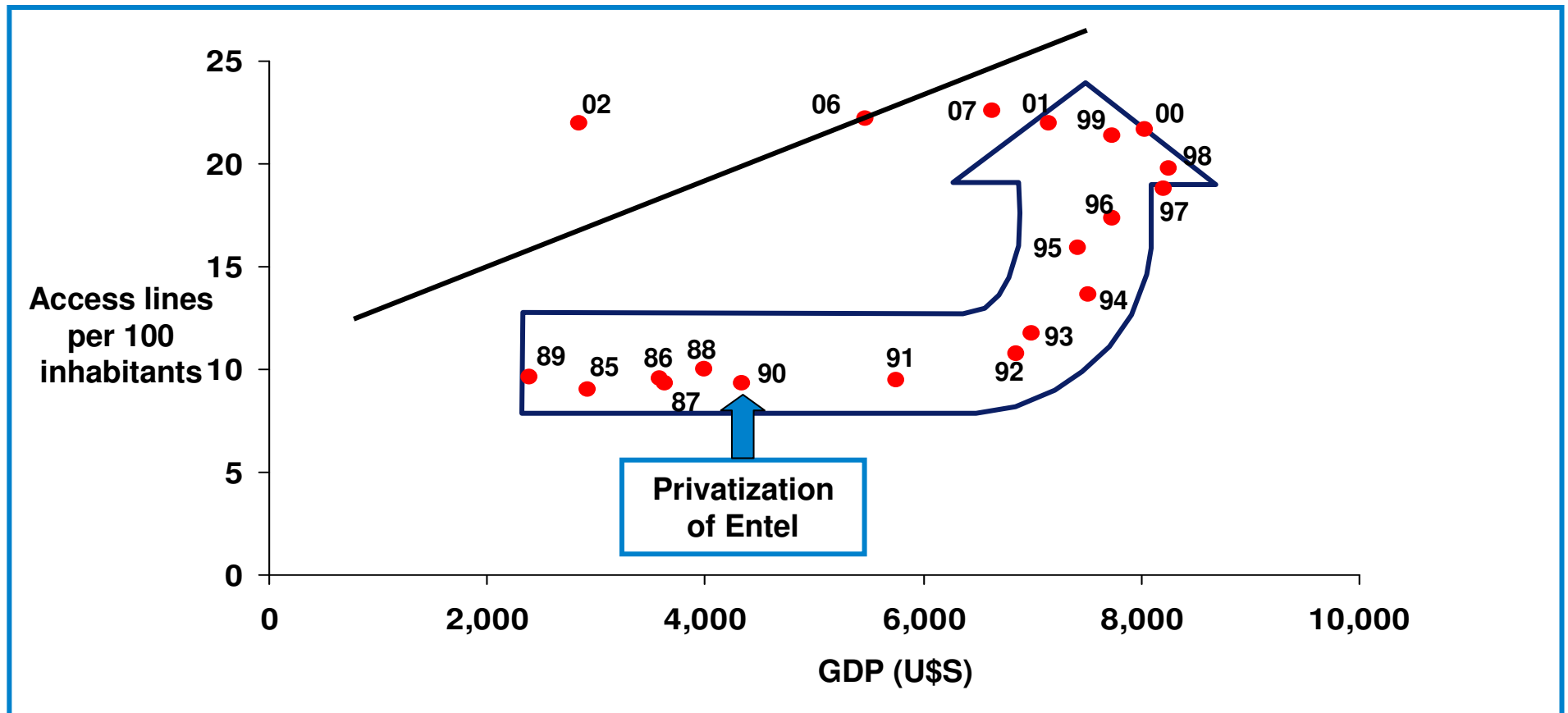
*Sevilla, Spain
March 30, 2009*

Contents

- **Long term demand trends**
- **Competition and industry structure**
- **Impact of the crisis and stimulus plans**
- **Implications for European policy makers and industry players**

The privatizations in Latin America allowed the region to increase the development of telecommunications infrastructure

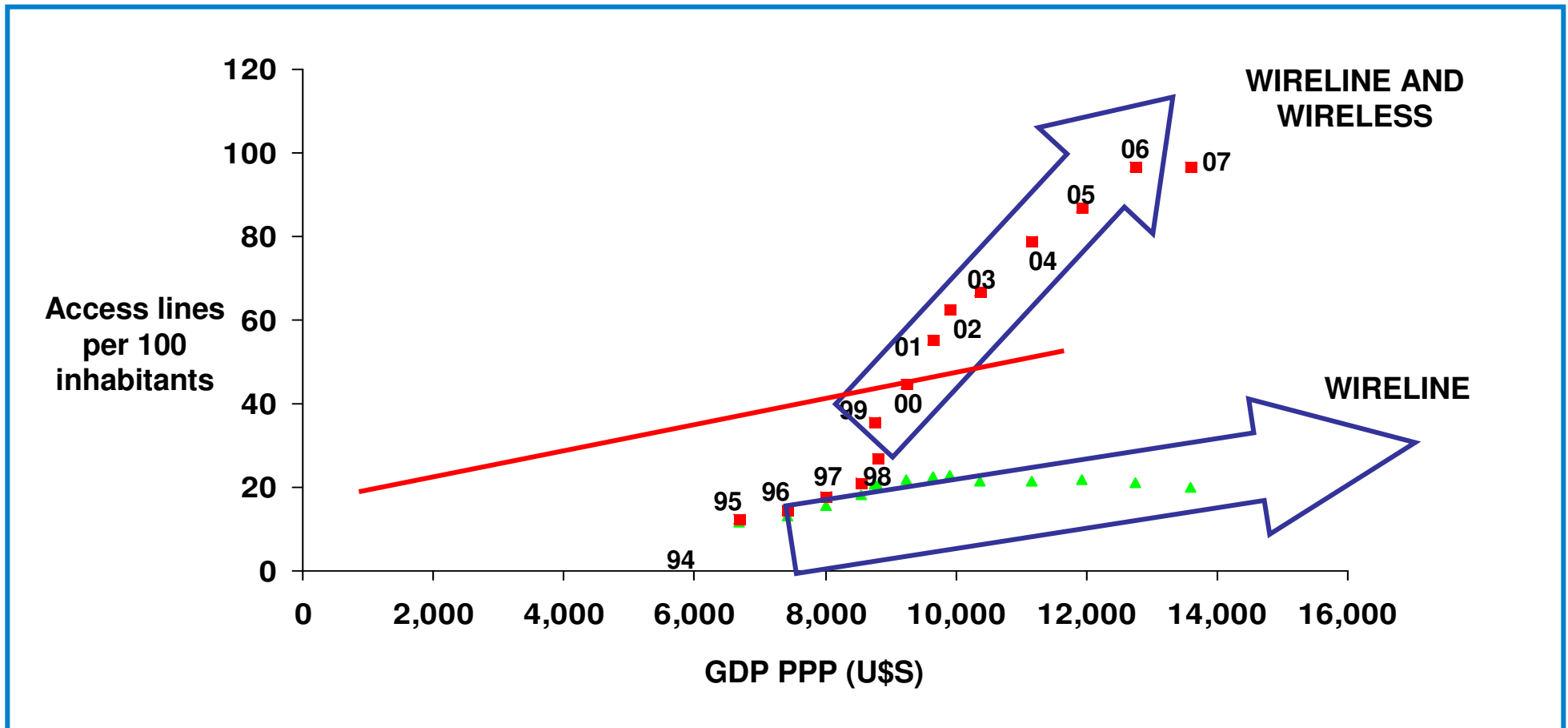
TELEDENSITY AND ECONOMIC DEVELOPMENT IN ARGENTINA (1985-2007)



Sources: World Bank; ITU; INDEC; Pyramid Research, analysis by the author

In addition to the privatizations, the mobile business enabled the region to attain high penetration of telephony

**TELEDENSITY AND ECONOMIC DEVELOPMENT IN CHILE
(1994-2005)**



Sources: World Bank; Subtel; analysis by the author

Wireless is about to reach total market penetration, while Internet usage is growing exponentially

USAGE OF WIRELESS AND INTERNET (January 2009)

Country	National penetration of mobile telephony	Mobile penetration at the bottom of the pyramid (*)	National penetration of internet	Usage of Internet in the bottom of the pyramid
Argentina	104.9 %	61 %	11.4 % (**)	14% (**)
Brasil	79.8 %	42 %	22.2 %	9%
Colombia	83.3 %	77 % (***)	22.1 %	18%
México	68.5 %	30 %	21.4 %	9%
Perú	61.6 %	37 %	35.7 %	28%

(*) Subscribers to a wireless line in the socioeconomic segments C3, D1, D2 y E (beginning 2008)

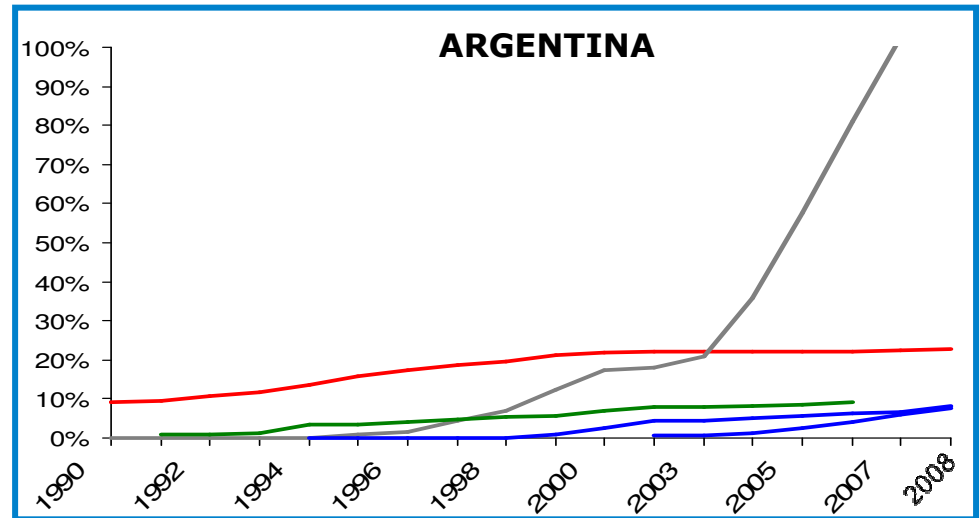
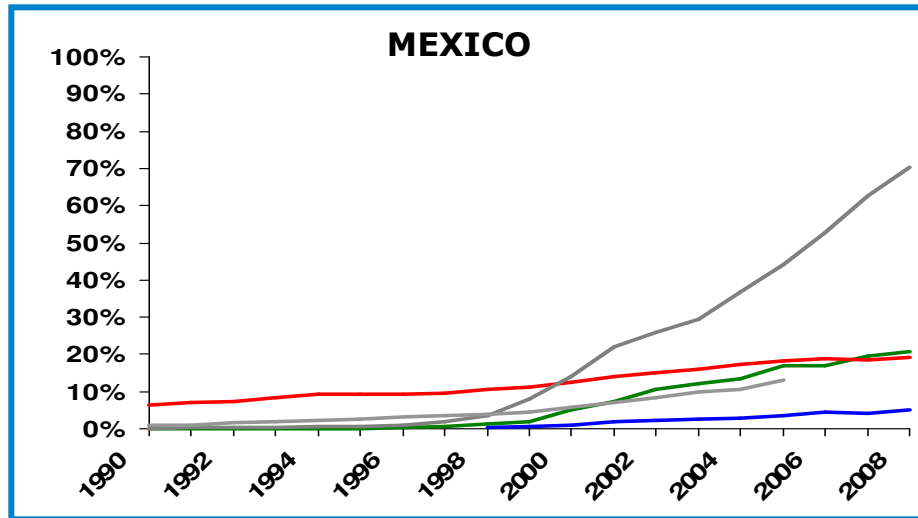
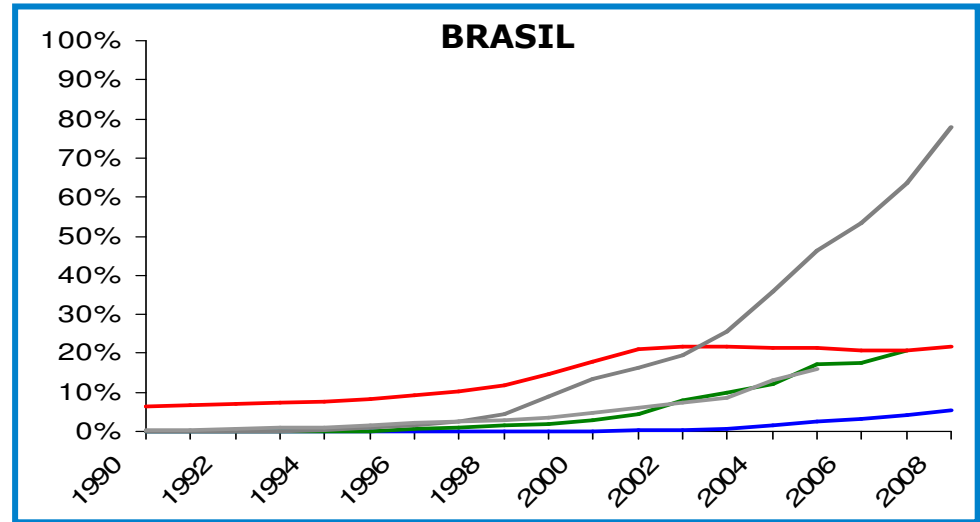
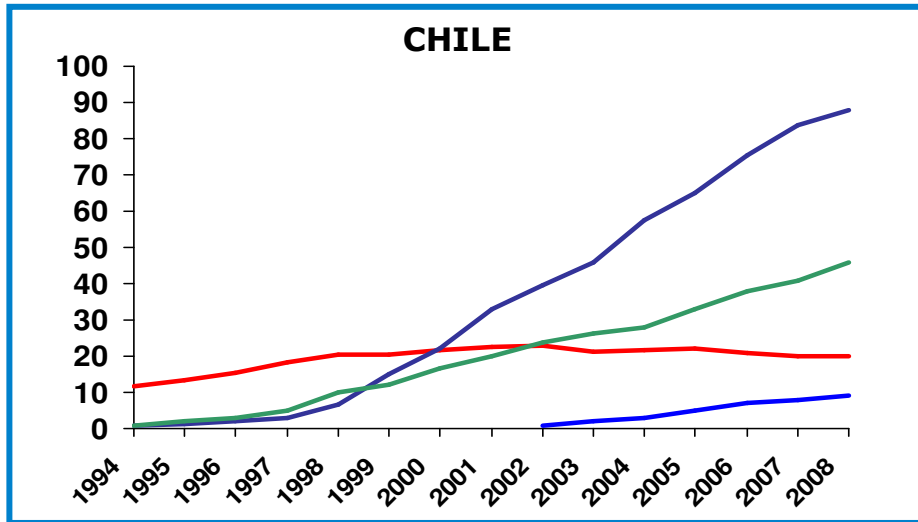
(**) The Internet national penetration rate is based on users of an email address while users in the bottom of the pyramid refers to those subscribers that have accessed the Internet at least once in the last month.

(***) December 2008

Sources: Dirsi (2007); Merrill Lynch; CNC; CRT; Cofetel; Osiptel

The next regional challenge lies in filling up the broadband demand gap

TELECOMMUNICATIONS SERVICES DIFFUSION



Sources: Subtel; Anatel; COFETEL; CNC; ITU; Pyramid Research, analysis by the author

Wireline — **Wireless** — **Broadband** — **Internet** —

Latin America needs to double the number of broadband lines to meet current demand

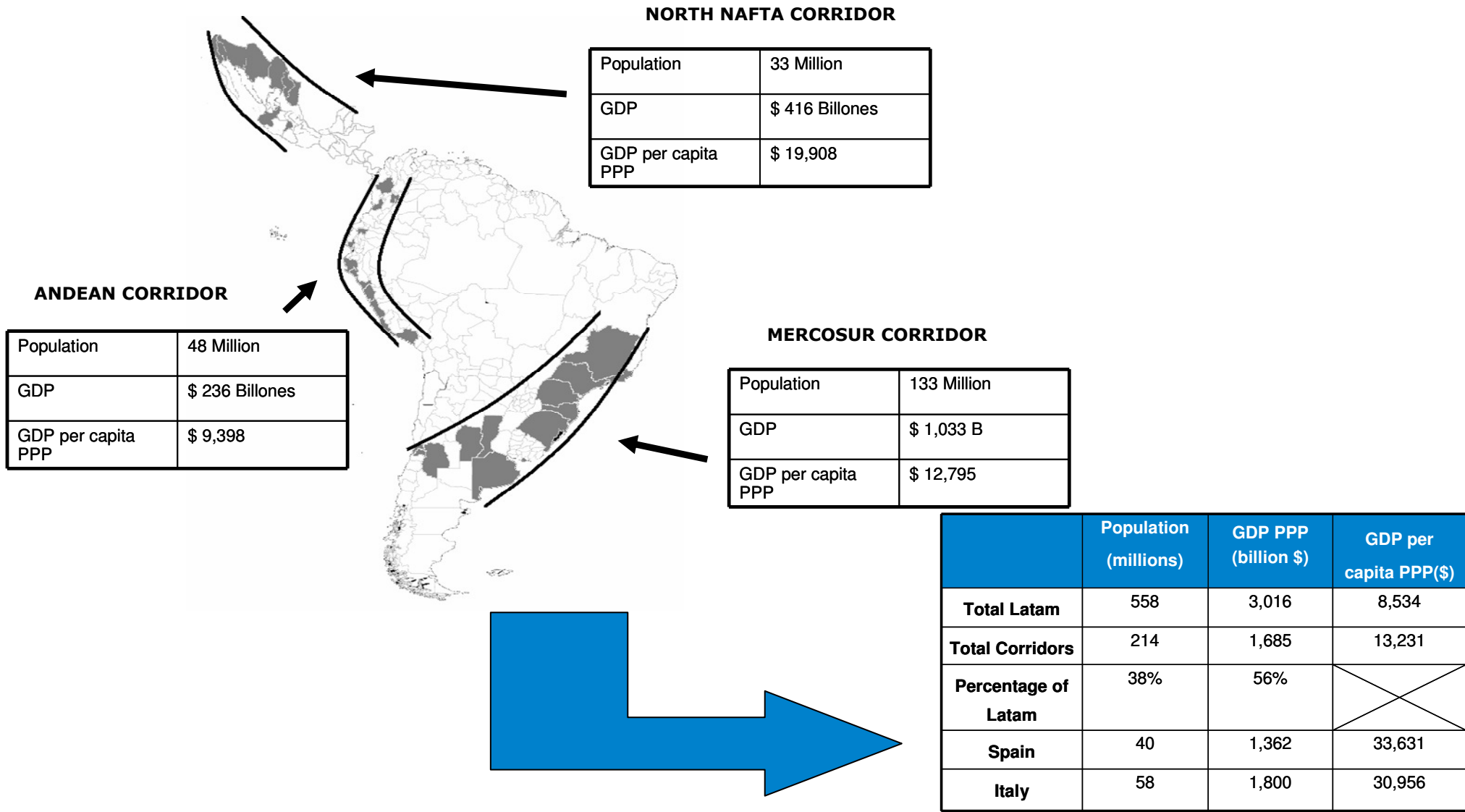
Country	Number of Broadband Lines (2007)	Estimation of broadband lines based on level of economic development (2007)	Demand Gap (2007)	Demand Gap (2010)
Argentina	2,582,580	3,163,074	580,493	799,235
Brazil	7,493,000	15,427,119	7,934,119	8,885,896
Chile	1,323,226	1,551,633	228,187	346,928
Colombia	1,275,680	3,298,681	2,023,001	2,144,518
Ecuador	198,000	943,523	745,523	819,493
El Salvador	135,200	472,977	337,777	386,638
Mexico	4,679,000	9,498,923	4,819,923	5,639,386
Nicaragua	44,240	347,102	302,862	337,400
Panamá	65,800	262,289	196,489	219,130
Peru	630,000	1,995,612	1,365,612	1,588,180
Venezuela	810,600	2,319,802	1,509,201	1,734,494
Uruguay	132,400	272,304	139,904	157,107
Total	19,369,946	39,553,037	20,183,091	23,058,406

Sources: UBS; IDC/Cisco; World Bank; analysis by the author

Wireless broadband will be a key technology to meet this demand

- Wimax is an economic solution for the last mile for many wireline operators
 - Wimax represents an opportunity to improve the deployment of broadband for wireline operators in order for them to offer triple and quad-play
 - For example, Telmex is utilizing Wimax to complete the development of its broadband both in those countries where it has a legacy network (Mexico) and in those where it does not have a wireline presence (Argentina, Chile, Perú)
- 3G platforms are also positioning themselves as an alternative broadband platform, which is adequate given the region's low average download speeds
- In addition, mobile broadband will become a more important Internet access platform with the telephone becoming the dominant access device; two constraints on this trend
 - Lengthening of handset replacement cycle will delay the universal adoption of 3G enabled devices
 - Even if users purchase a 3G enabled handset, they still need to subscribe to a data program (30% do not)

In addition, Latin America has to emphasize technology development in three core economic “corridors”



While ICT penetration in the “corridors” is higher than in the rest of the continent, unmet broadband demand is twice the current base

TOTAL PENETRATION OF TELECOMMUNICATIONS IN LATAM AND CORRIDORS

	Wireline	Wireless	Broadband
Total Latam (*)	16.5 %	60.0 %	3.3 %
Andean Corridor	21.3 %	94.6 %	3.2 %
Mercosur Corridor	28.5 %	83.5 %	6.5 %
NAFTA South Corridor	19.0 %	64.2 %	4.3 %

BROADBAND DEMAND IN LATAM CORRIDORS

Broadband Penetration (lines)	Estimated Broadband demand (lines)
946,935	3,771,555
8,727,930	12,209,700
2,000,000 (e)	3,649,044

(*) Includes Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, Venezuela, Uruguay y Peru

Source: Katz (2009)

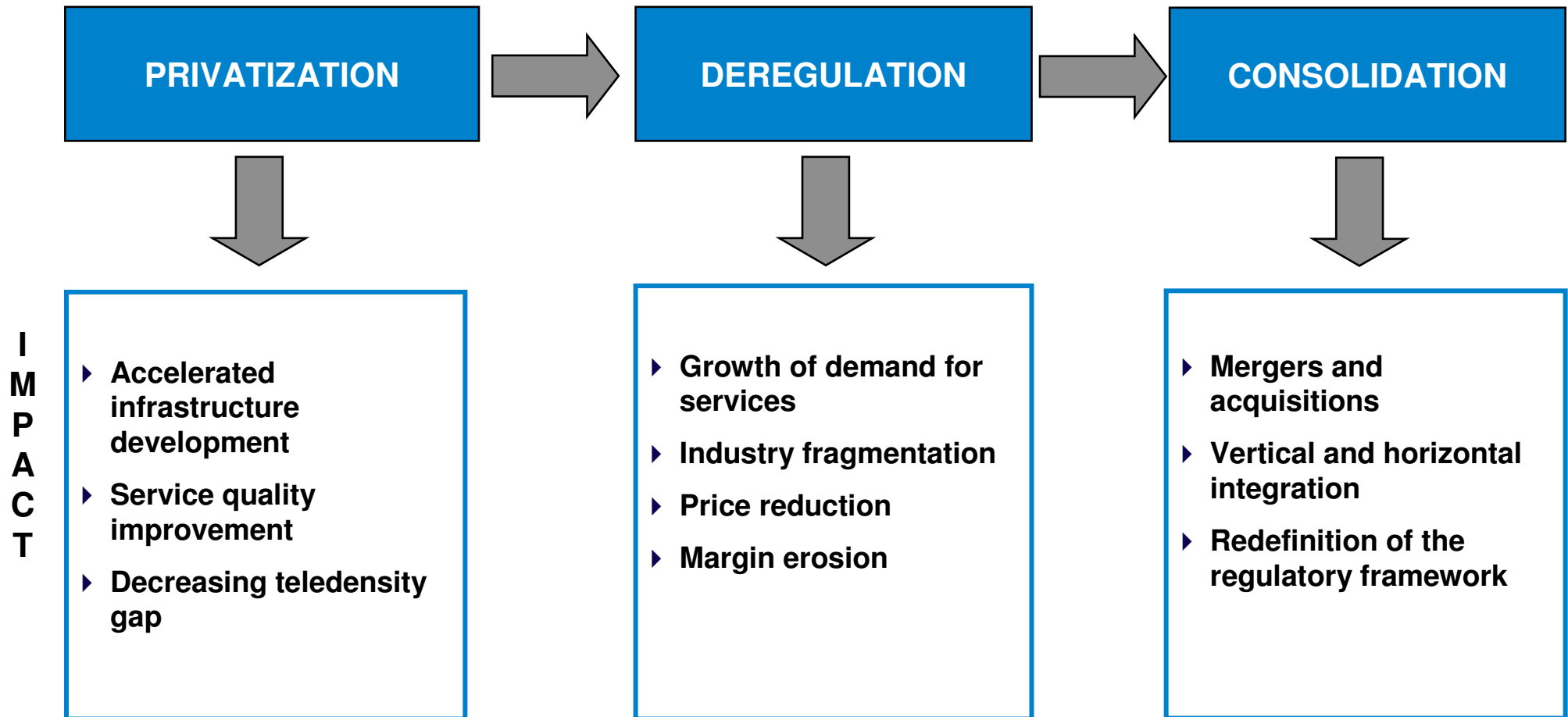
Conclusions regarding long-term demand trends

- The wireless sector has been the development engine for telecommunications in Latin America, helping telephony achieve in the medium term the much sought-after goal of universal service
- In addition, wireless is also well placed to help meeting the unmet demand for broadband
- Looking forward, the region is facing four critical challenges
 - Support the growing needs for Latin American information societies
 - Meet the broadband demand gap
 - Support ICT adoption by SMEs
 - Emphasize technology deployment in the economic corridors to the level of industrialized countries

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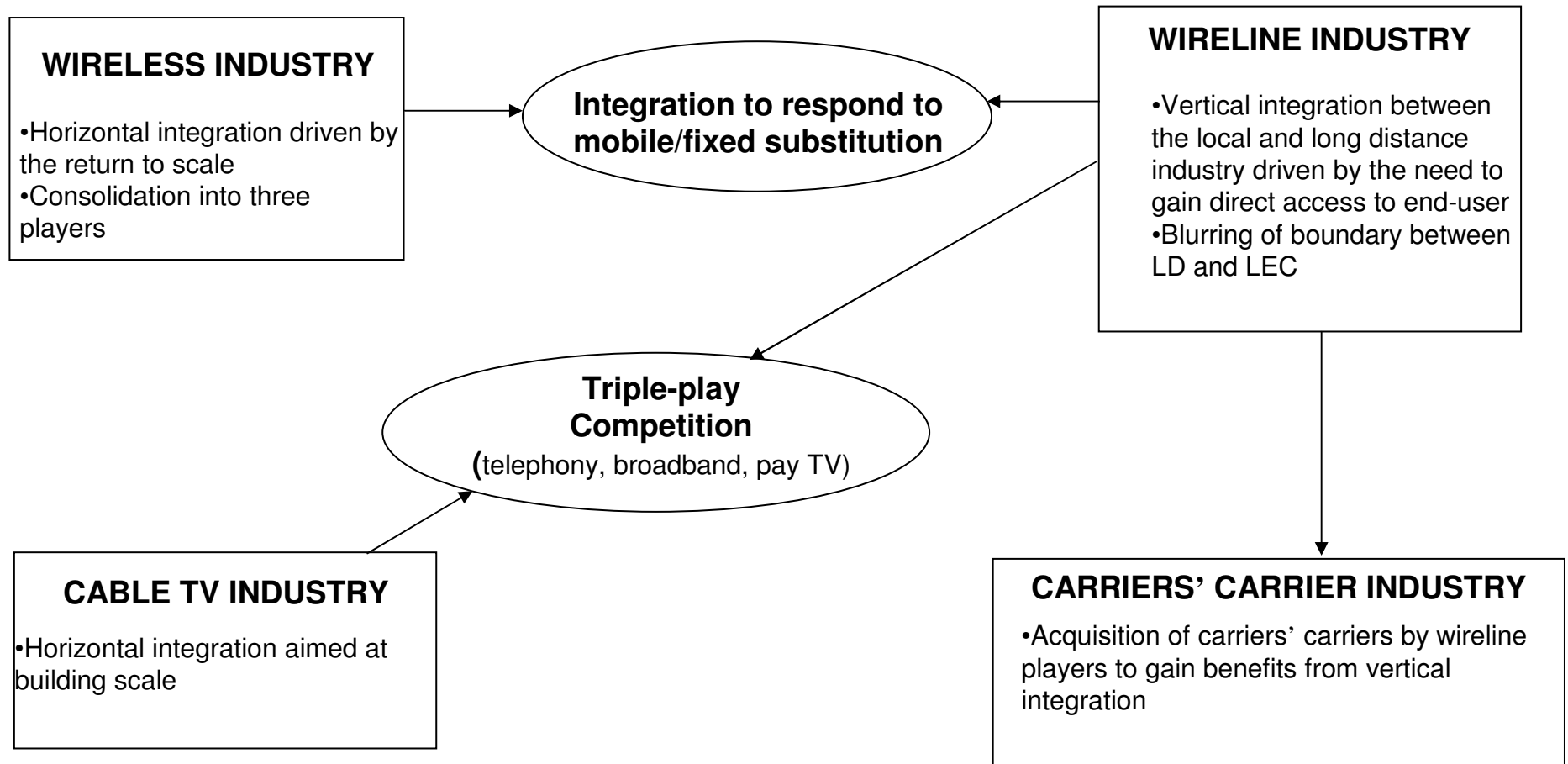
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The communications industry in Latin America has undergone three fundamental restructuring processes



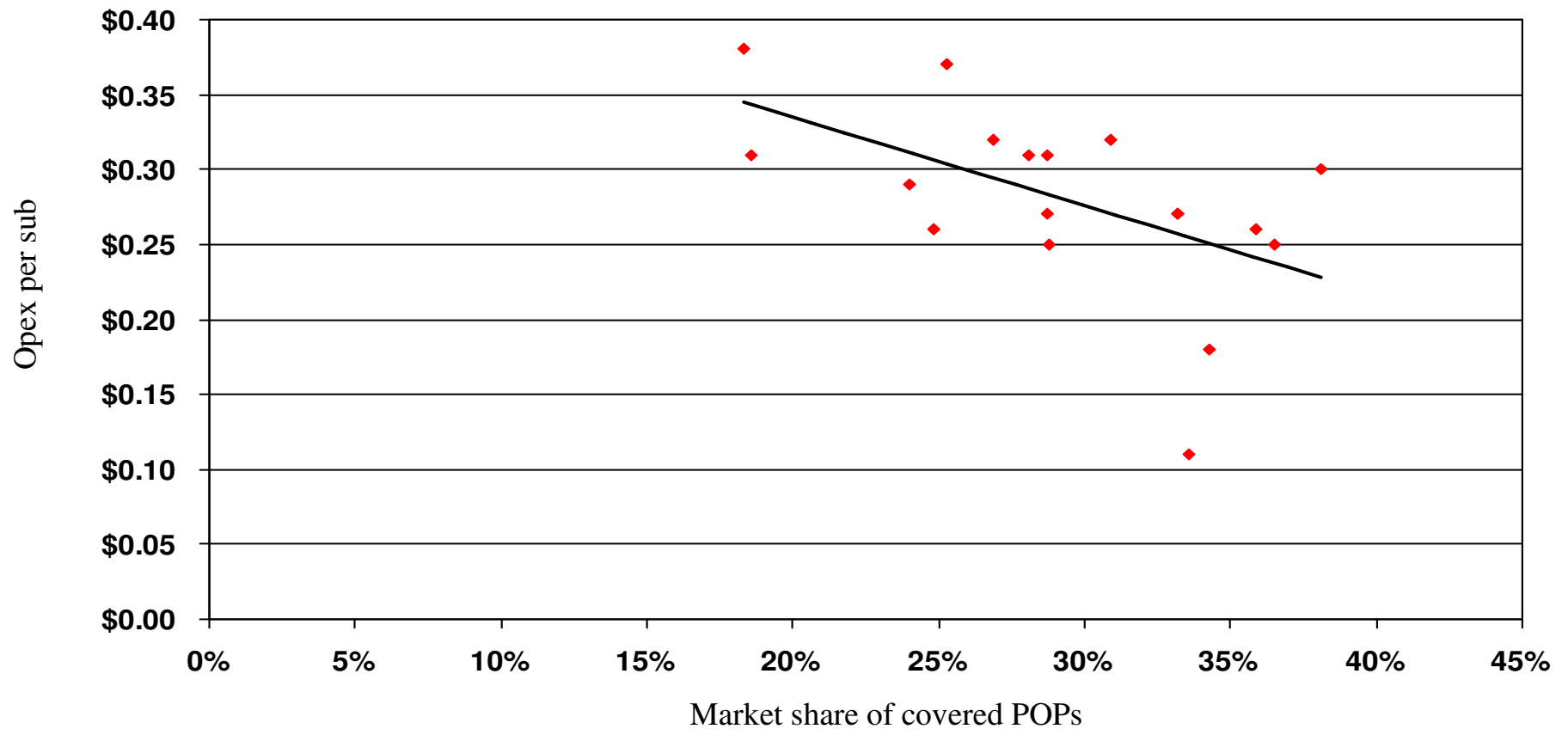
We expect the industry to continue to consolidate driven by the need to return to scale, integrate vertically and tackle convergent trends

CONSOLIDATION TRENDS



Wireless consolidation has been driven by a return to economies of scale

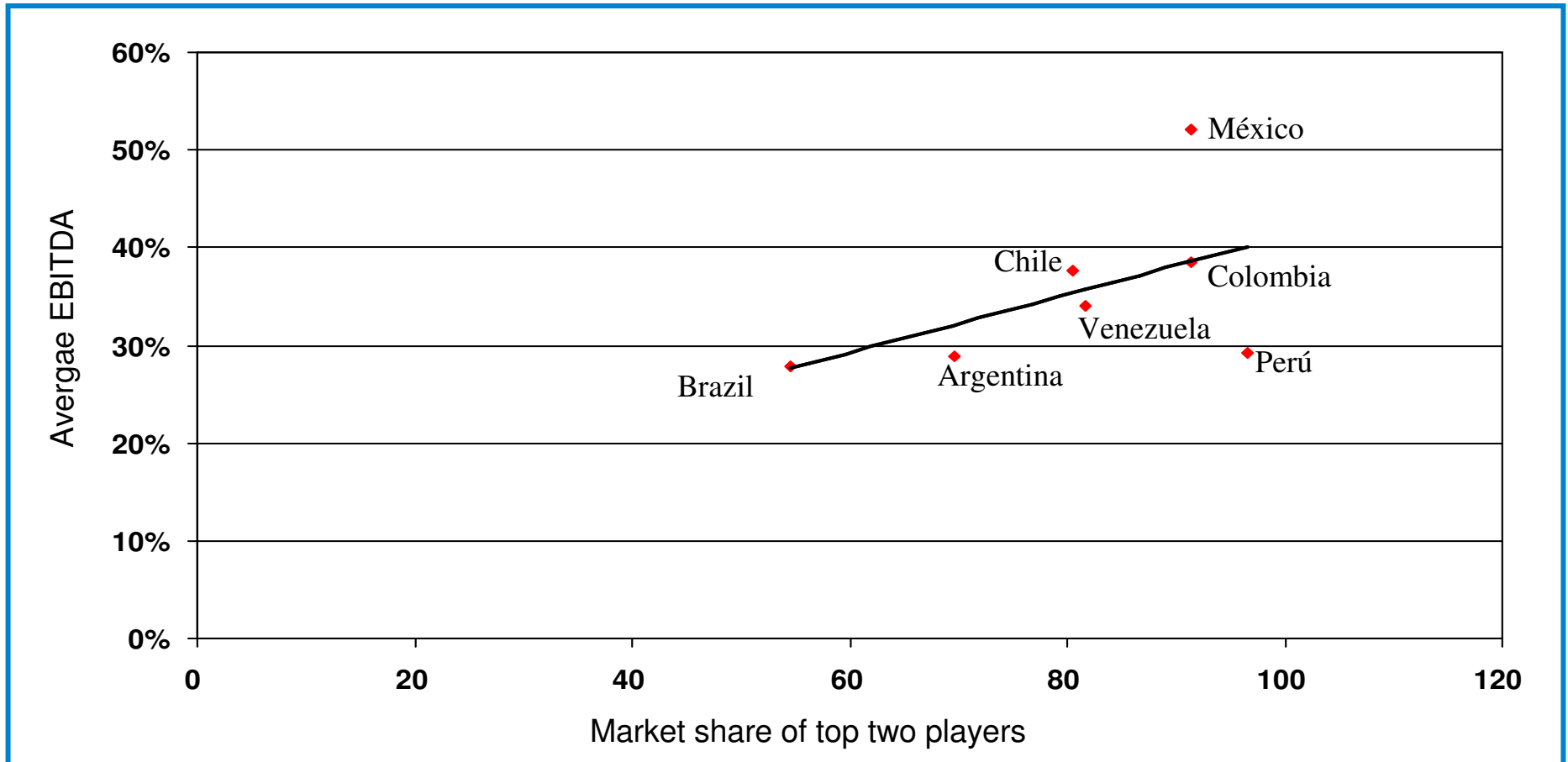
ECONOMIES OF SCALE AND MARKET SHARE OF COVERED POPS IN THE LATIN AMERICAN WIRELESS INDUSTRY (2007)



Sources: Merrill Lynch; analysis by the author

Additionally, consolidation results from a need to impose price discipline

CONSOLIDATION AND WIRELESS INDUSTRY PROFITABILITY (2008)





Sources: Merrill Lynch; analysis by the author

In Latin America, the wireless sector is already fairly concentrated

WIRELESS SUBSCRIBERS IN LATIN AMERICA (2008)

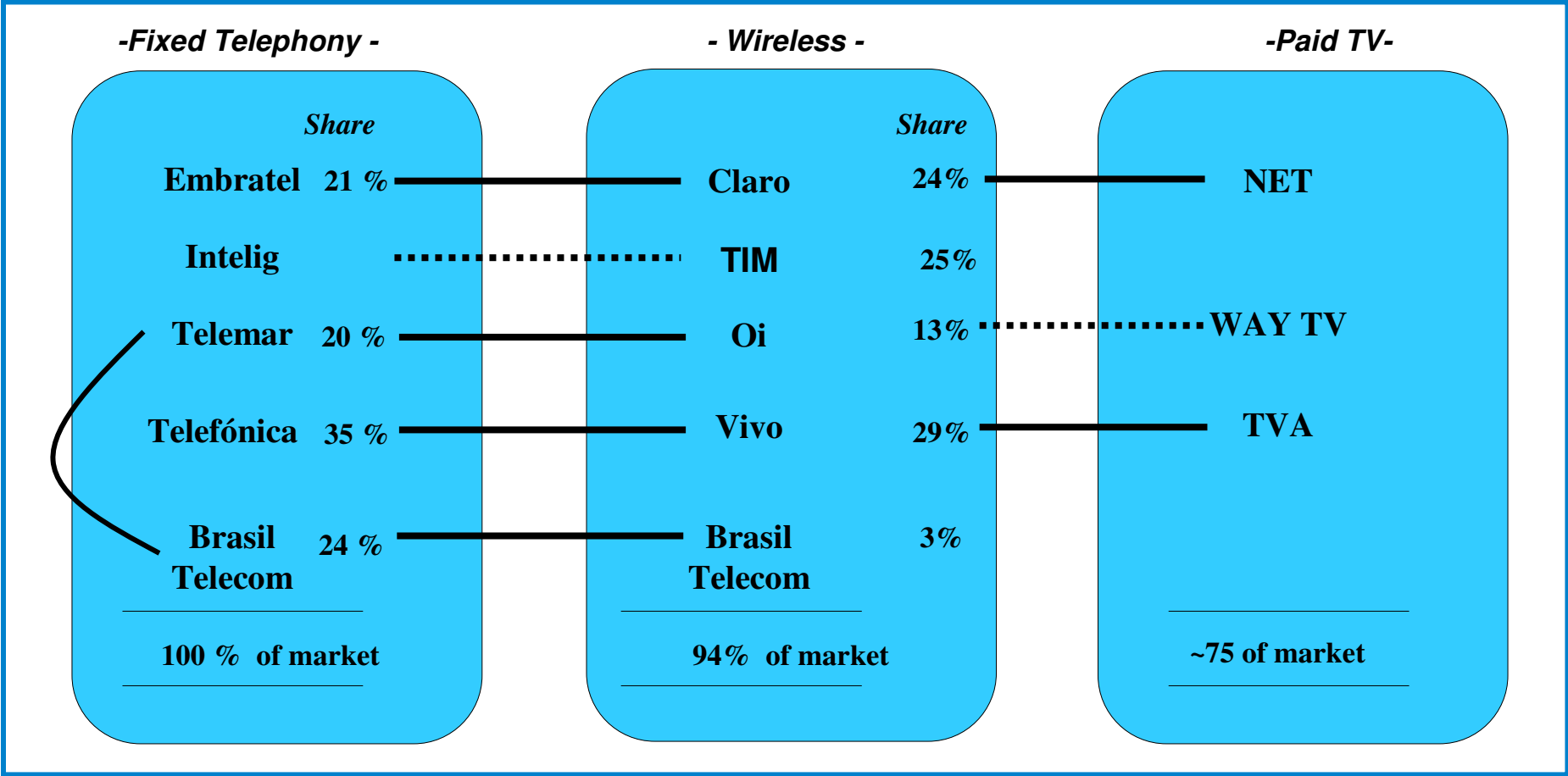
PAIS	TELEFONICA	AMERICA MOVIL	TELECOM ITALIA MOBILE	OTROS	TOTAL
▲ Argentina	14,653,000 (35%)	14,818,000 (35%)	11,941,000 (28%)	937,000 (2%)	42,349,000
Brazil	42,227,000 (30%)	35,668,000 (25%)	35,207,000 (25%)	29,362,000 (20%)	142,464,000
Chile	6,703,000 (44%)	2,787,000 (18%)	-----	5,850,000 (38%)	15,340,000
▲ Colombia	9,702,000 (25%)	25,373,000 (66%)	-----	3,276,000 (9%)	38,351,000
▲ Mexico	14,662,000 (19%)	54,381,000 (72%)	-----	6,656,000 (9%)	75,699,000
▲ Perú	10,010,000 (58%)	6,722,000 (39%)	-----	621,000 (3%)	17,353,000
Venezuela	10,280,000 (38%)	-----	-----	16,751,000 (62%)	27,031,000
Total	108,237,000 (30%)	139,749,000 (39%)	47,178,000 (13%)	63,453,000 (18%)	358,617,000

Sources: Merrill Lynch; informe de operadores; analysis by the author

 Share > O = 30%
  C2 > 60%

In parallel with horizontal integration, we witness an emerging vertical integration across industry sectors

BRAZIL: COMMUNICATIONS MARKET STRUCTURE



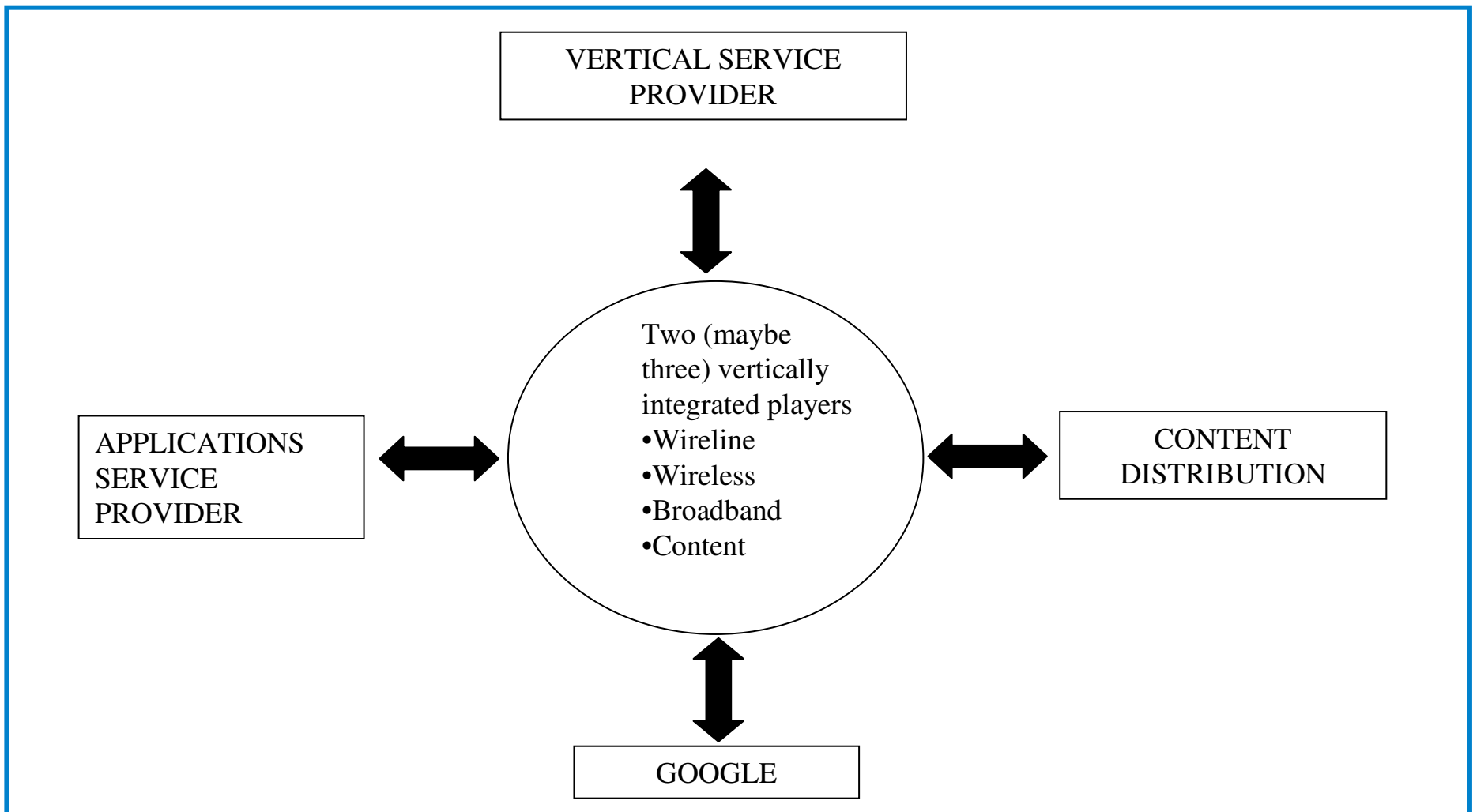
Sources: Operators; analysis by the author

Vertical integration is prompted by economies of scope and the search for new market opportunities

- Economies of scope refer to efficiencies primarily associated with demand-side changes, such as increasing or decreasing the scope of marketing and distribution, of different types of products (advertising synergies, brand power, distribution synergies)
- In addition, operators undergoing this process are searching to increase their share of communications spend wallet of consumers
- While bundling is one of the by-products of vertical integration, the benefits to operators are more important in the other areas pointed above

According to these trends, the industry structure would result in two (maybe three) scale-driven carriers serving several niche players

INDUSTRY STRUCTURE



To sum up, the industry structure exhibits high level of horizontal integration and moderate vertical integration

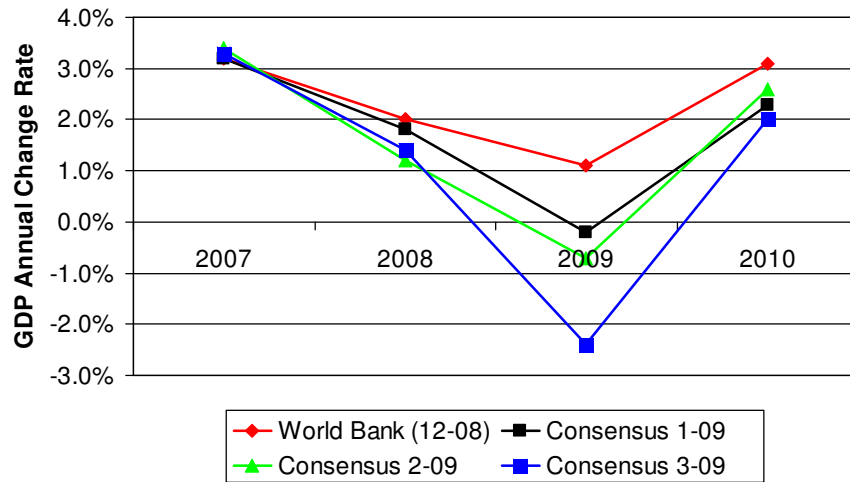
- Exit and divestment of operators and investors after economic crises
- Horizontal consolidation of wireless services
- Consolidation of cable TV industry
- Increasing vertical integration between telephony and content distribution
- Regional integration of vertically integrated operators

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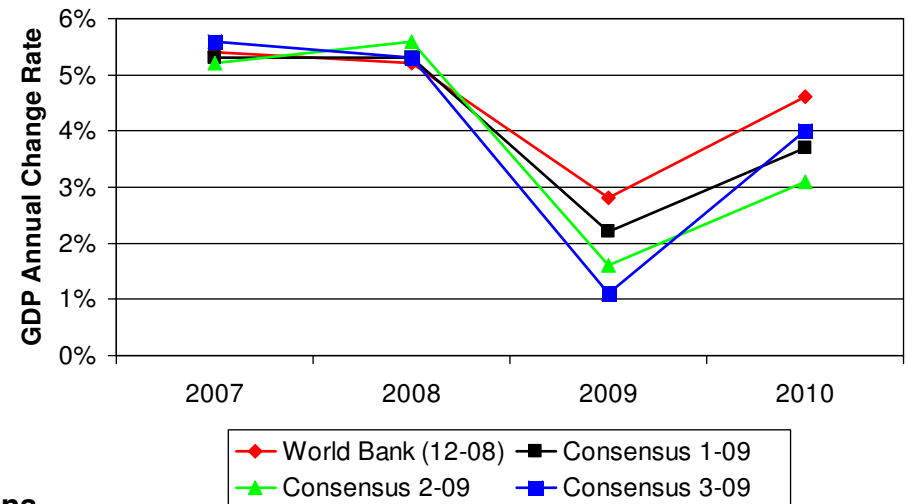
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The world economic crisis is increasingly having an impact on Latin America

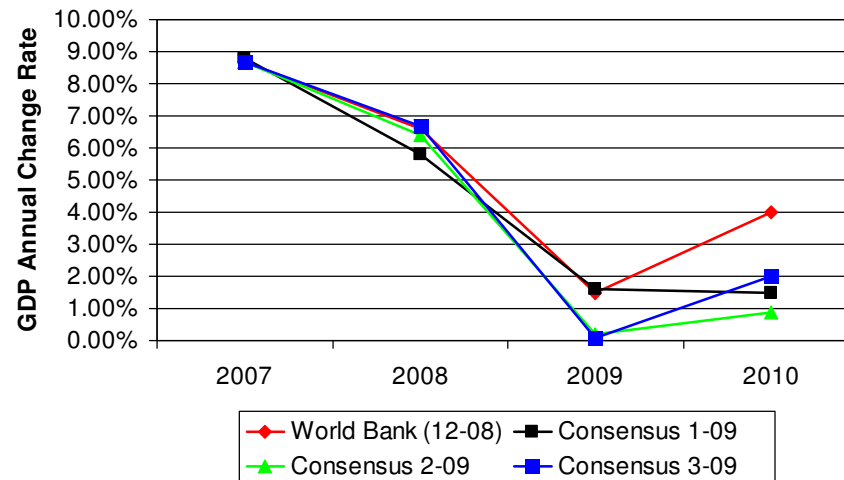
Mexico



Brazil



Argentina



The macroeconomic deterioration is already impacting consumption

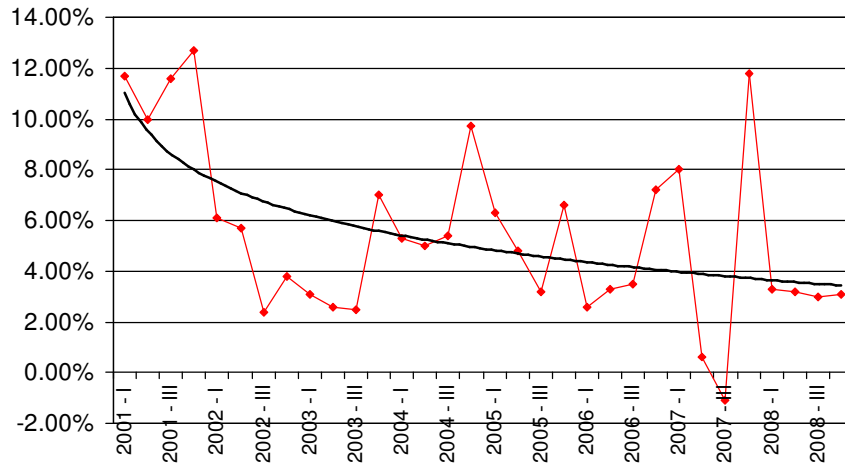
COUNTRY	VARIABLES AFFECTING CONSUMPTION
Mexico	<ul style="list-style-type: none"> • Since May 2008 unemployment climbed dramatically, reaching 5.3% in February (highest since April 1996). Unemployment increase was driven primarily by a drop in employment in manufacturing (6.7%) and construction (3.7%) • The consumer confidence index has also deteriorated in the past months. In particular, one sub-index (possibility of acquiring a consumer durable good) has been a key driver • Consumer credit is also being affected by weak demand and limited offer. Banks are restricting consumer credit to avoid further profit erosion • Finally, the negative trends in the US employment market determined that during 2008 funds transfers reduced by 3.6% compared to 2007
Brazil	<ul style="list-style-type: none"> • Unemployment reached 8% in January 2009 • In December 2008, the GDP fell by 15% with respect to 2007
Argentina	<ul style="list-style-type: none"> • Private consumption has undergone a deceleration during 2008 reflecting an erosion in consumer confidence • The index of consumer confidence has dropped 28.1% in December 2008 reaching its lowest level since March 2003

What type of effect is the crisis expecting to have on telecommunications consumption in the region?

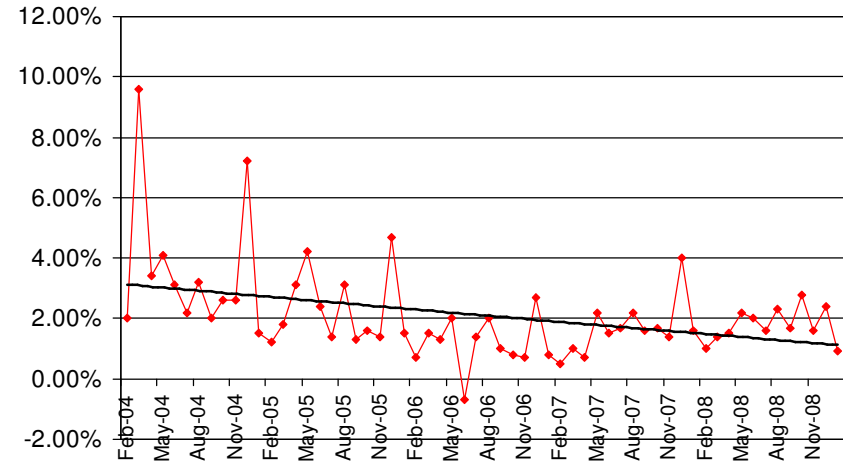
- The consumption of telecommunications goods and services is determined by two factors: income elasticity and penetration rate
 - Income elasticity determines the amount of reduction or increase in consumer spending as a result of changes household revenues: the higher the elasticity, the higher sensitivity of telecom consumption to income changes
 - Elasticity is a function service penetration: when service adoption is low, it is considered a superfluous consumption by a large portion of adopters and therefore the elasticity to deterioration of income will be high; conversely, if penetration is high, the service is perceived as a necessary good (a utility) and therefore inelastic to household income
- What does this mean for future consumption of telecommunications services in Latin America?
 - Wireless telephony has reached high penetration levels and, therefore, is perceived as a necessary service, which would mean that it would remain isolated from consumption effects; furthermore, the high proportion of pre-paid subscribers allows users to control spending by reducing usage rather than disconnecting or postponing purchases
 - Wireline would be affected insofar that, with the acceleration of fixed-mobile substitution, disconnection rates of fixed lines could increase
 - Broadband could be affected by the consumption trends, although the situation of unmet demand could still neutralize a negative trend (more below)

First effect: the reduction in wireless growth rate is, for the time being, linked to saturation rather than the crisis

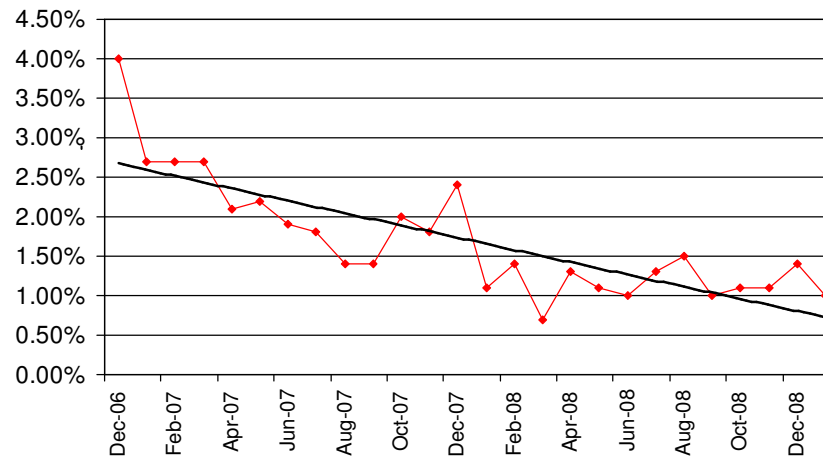
Mexico



Brasil



Argentina

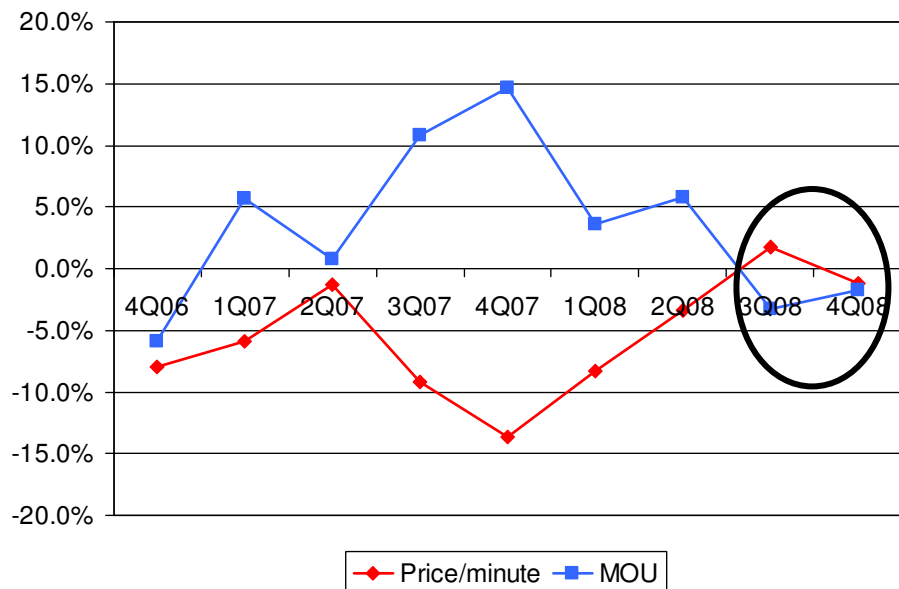


Sources: COFETEL; Teleco; CNC; analysis by the author

Second effect: however, an impact has been detected in usage and handset replacement patterns

Preliminary indications show an impact on wireless usage driven by a decrease in price elasticity

America Móvil in México: Q-t-Q change rate in pricing and MOU



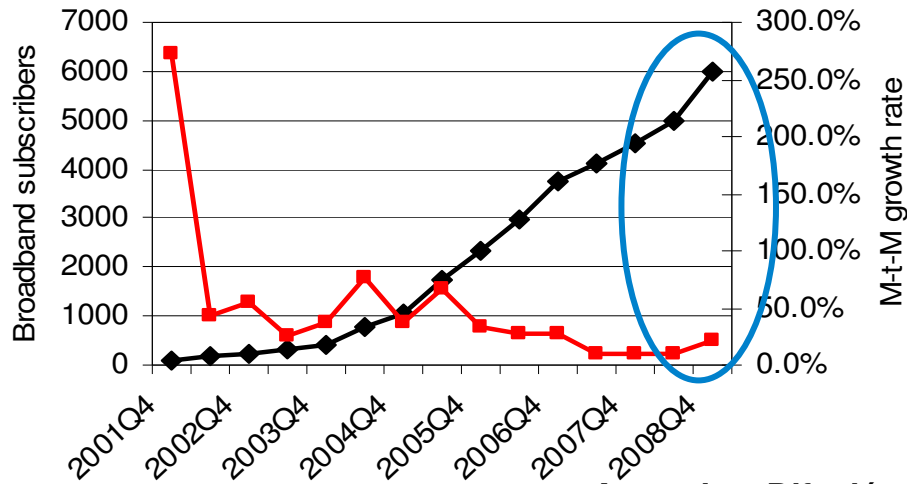
Source: Deutsche Bank Securities

Additionally, an extension of device replacement cycles can be detected

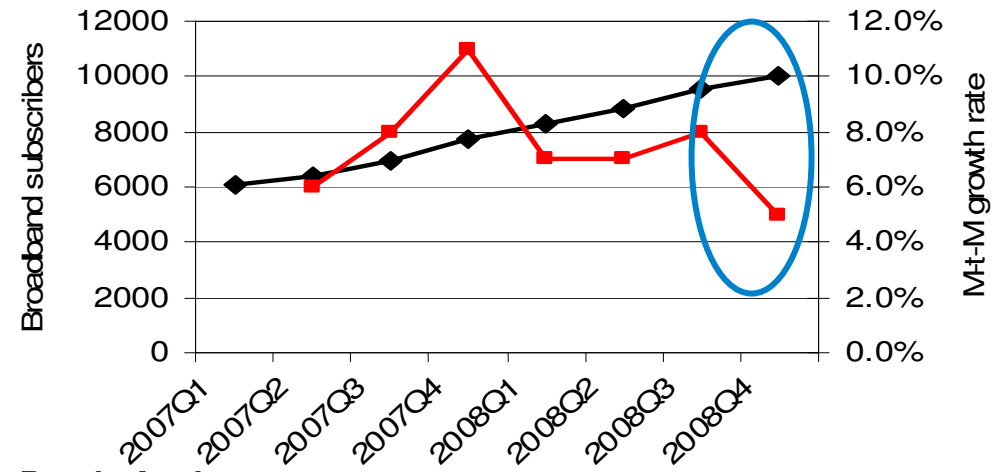
- Historically, device replacement cycles in Latin America has ranged from 1.5 to 2 years (consistent with worldwide data)
- However, in parallel with the economic deterioration, replacement cycles have been extended, reaching 1.5 to 2 years (still faster than PCs which is 3.5 years)
- This trend has resulted in significant slowdown of handset sales in 4Q08

Third effect: the broadband trend indicates a deceleration of growth in some countries

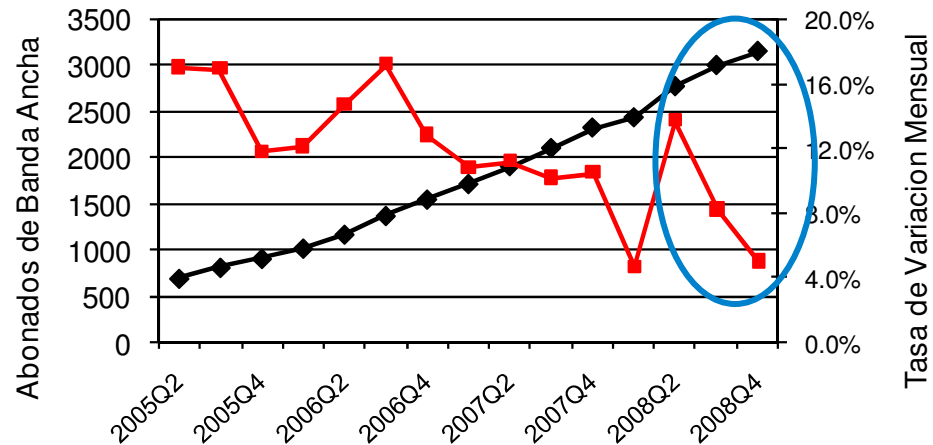
Mexico: Broadband diffusion



Brasil: Broadband Diffusion



Argentina: Difusión de Banda Ancha

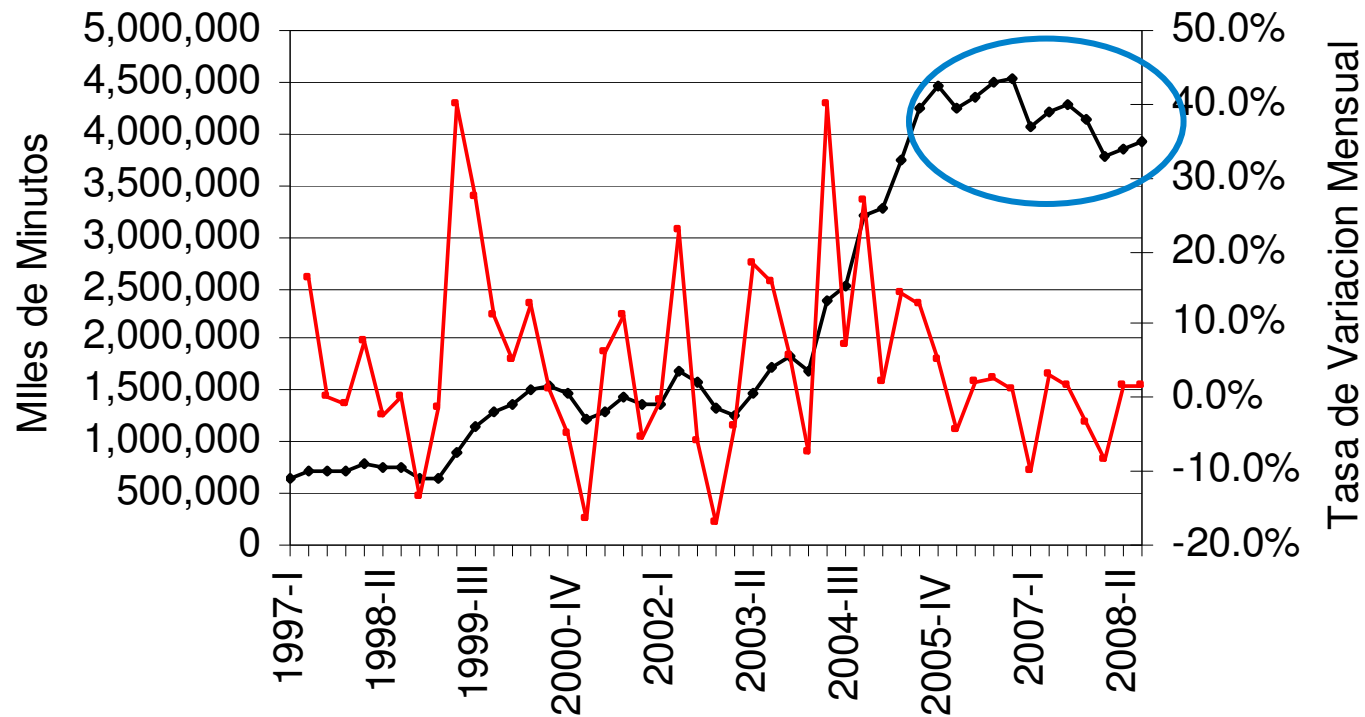


Third effect: a number of trends could be subsumed in the broadband situation

- First sub-effect: under situation of unmet demand (see below), there could be still room for growth under economic crisis
 - Mexico: 4.3%
 - Brazil: 4.1%
 - Argentina: 6.6 %
- Second effect: Current users in certain market segments, particularly in lower socio-demographic categories, could be undergoing fixed broadband disconnection, replacing occasional internet access with mobile broadband and relying on workplace broadband to download heavy content (effect already seen in Europe)
- Third effect: Prospective adopters could be postponing purchasing of service consistent with deterioration of consumer confidence

Fourth effect: the US economy is having a spill-over effect in Long Distance usage

Mexico: International Long Distance from the US and Canada

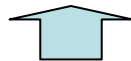


Source: Cofetel; analysis by the author

The macroeconomic climate should also affect the levels of capital investment in the telecommunications industry

Variables that impact the capex rate

Key Variables	<ul style="list-style-type: none"> •Expected return rate •Risk associated with the rate of return 		
Secondary Variables	Macro-economy	ICT industry	Firm level
	<ul style="list-style-type: none"> ○Acceleration effect (Roller y Waverman, 2001) ○Demographic and geographic characteristics ○Economic cycle (Katz, 2003) ○Generic regulatory framework I 	<ul style="list-style-type: none"> ○Industry regulation ○Competitive intensity ○Technological progress ○Evolution of demand 	<ul style="list-style-type: none"> ○Cost of capital ○Debt leverage ○Firm profitability



A reduction of the GDP growth rate of 1% leads to a decline of 0.7% in the investment rate

Data indicates so far a capital investment negative trend

CAPITAL INVESTMENT IN LATIN AMERICAN TELECOMMUNICATIONS

COMPANY	INVESTMENT 1996-2006 (in \$ billions)	INVESTMENT 2007-8 (in \$ billions)	2009 ANNOUNCEMENTS (in \$ billions)
Telefonica	24.785	10.547	•Telefónica expects total capex this year to be below 7.5bn euros compared to 8.40bn euros last year
Telecom Italia	12.189	3.176	1.411
America Movil	10.282	9.283	3.224
Telmex International	7.925	2.914	•Reduced 2009 capex from 1,630 million to 1,100 million
Portugal Telecom	6.650	2.511	1.235
Cable & Wireless	1.449		
Total	63.28		

Sources: Unctad; Dow Jones; Deutsche Bank

In response to the economic crisis, governments have begun to deploy incremental public infrastructure programs with some ICT focus

LATIN AMERICAN INFRASTRUCTURE STIMULUS PROGRAMS

COUNTRY	INFRASTRUCTURE PROGRAM (in US\$ billion)	ICT FOCUS (in US\$ billion)
Colombia	\$ 10.0	\$ 0.29 b (\$0.16 b in universal telephony, \$0.05 b in ICT education, \$0.03 b in Broadcasting, \$0.03 b in computing education and \$0.02 b in e-government)
Chile	\$ 2.5	\$ 0.06 b (rural broadband)
Mexico	\$ 6.9	No ICT specific plans
Bolivia	\$ 0.870 (\$0.690 to roads)	No ICT specific plans
Brazil	\$ 2.5	No ICT specific plans

Sources: ECLAC; Colombia Departamento Nacional de Planeamiento; Servicio de Estudios Economicos BBVA

How many jobs could be generated as a result of a telecommunications stimulus plan?

NETWORK CONSTRUCTION	NETWORK EFFECTS	NEXT GENERATION EFFECT
<ul style="list-style-type: none"> •The construction of broadband network has moderate direct and indirect employment effects •While total industrial output generated by the deployment of broadband is significant, the proportion of imported goods is high, thereby reducing the amount of jobs being created •The induced effects of network construction magnify the total impact of network deployment 	<ul style="list-style-type: none"> •Network externalities of broadband between 10% and 50% penetration levels are substantial <ul style="list-style-type: none"> –Innovation –Core development clusters •Jobs can also be created as a result of a net outsourcing and firm relocation in pursuit of labor cost arbitraging 	<ul style="list-style-type: none"> •Speed improvement in served areas could result in enhanced productivity and economic growth

HIGH

MEDIUM

LOW

Degree of certainty

In the US, the Obama broadband stimulus program will generate 128,000 jobs over four years for construction

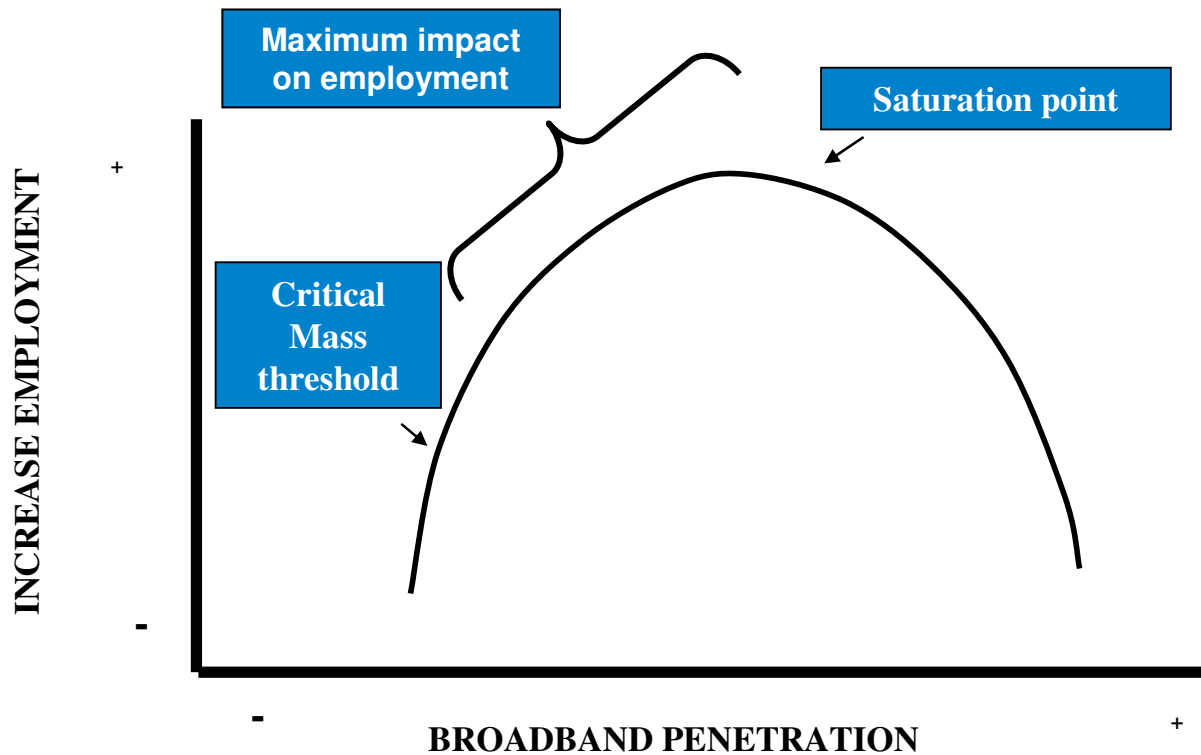
			BILL
Investment (all \$ numbers in millions)			\$ 6,390
Employment Creation	Direct effect	Jobs in equipment eq. mfr, construction and telecoms	37,300
	Indirect effect	Jobs in other sectors	31,000
	Induced effect	Household spending induced from direct/indirect effects	59,500
	Total effect	Jobs in all sectors	127,800
Multipliers	Type I Multiplier	(Direct + indirect)/direct	1.83
	Type II Multiplier	(Direct + indirect + induced)/direct	3.42

Sector	Effect
Electronic eq.	4,242
Construction	26,218
Communications	6,823
Total	37,283

Sector	Effect
Distribution	9,167
Transportation	1,536
Metal products	1,839
Electronic Eng.	959
Other services	8,841
Other	8,704
Total	31,046

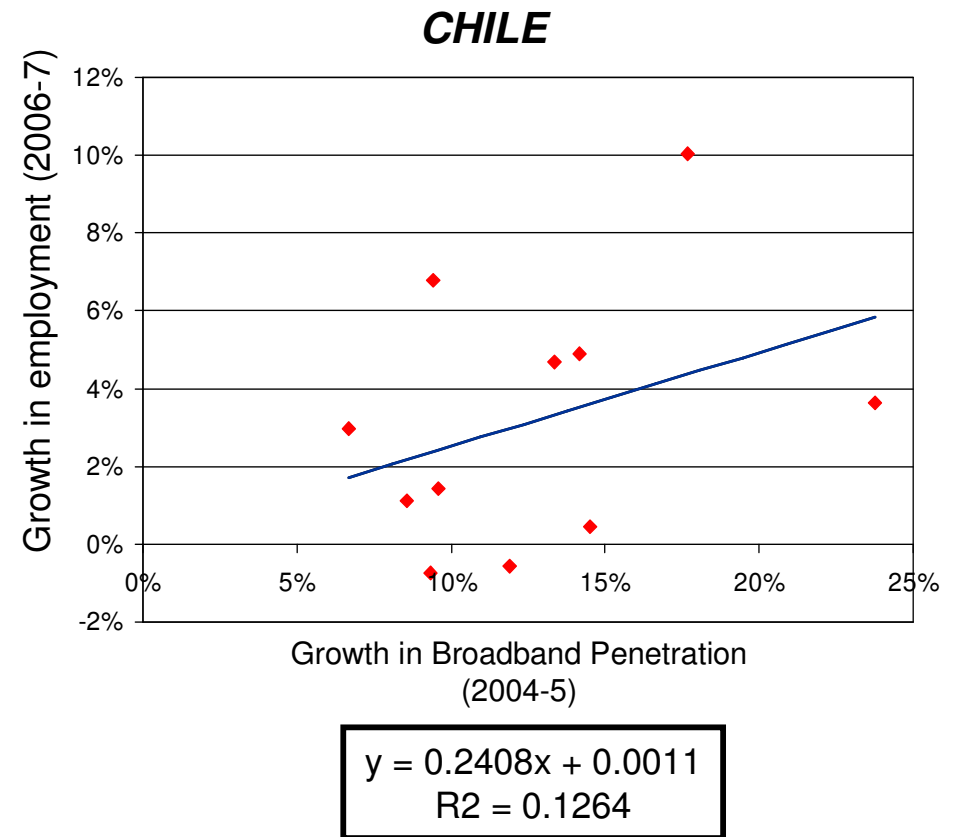
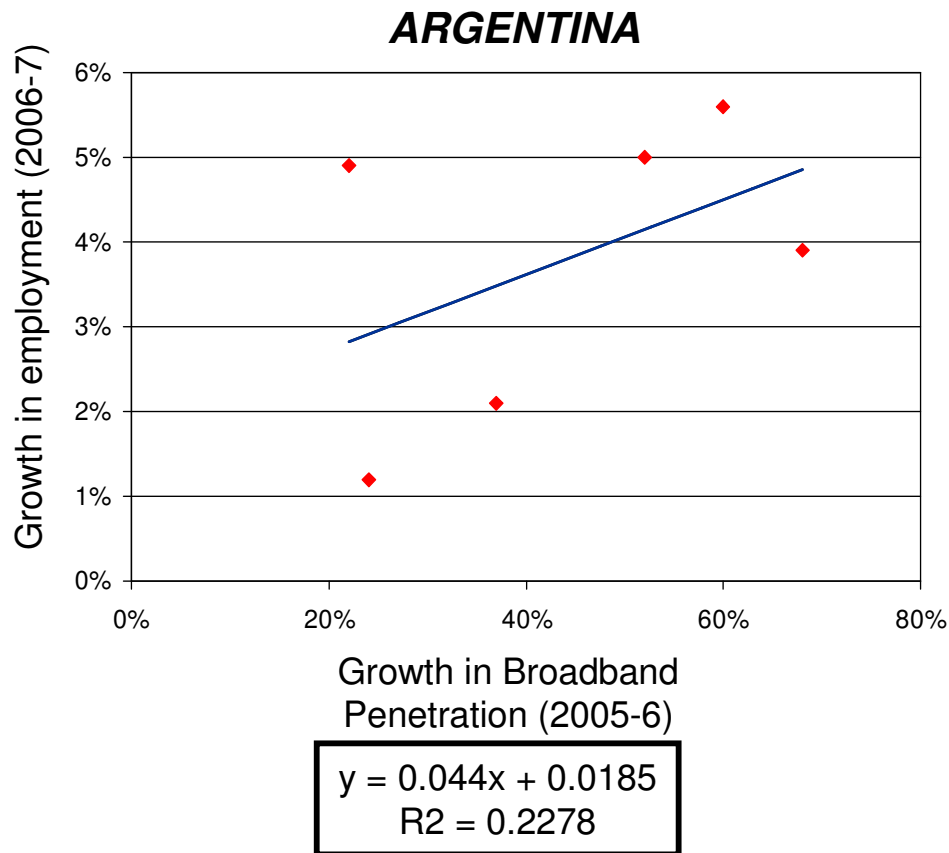
With regards to network effects, increasing evidence points to a level of broadband development where network effects are highest

IMPACT OF BROADBAND ON EMPLOYMENT OVER DIFFUSION PROCESS



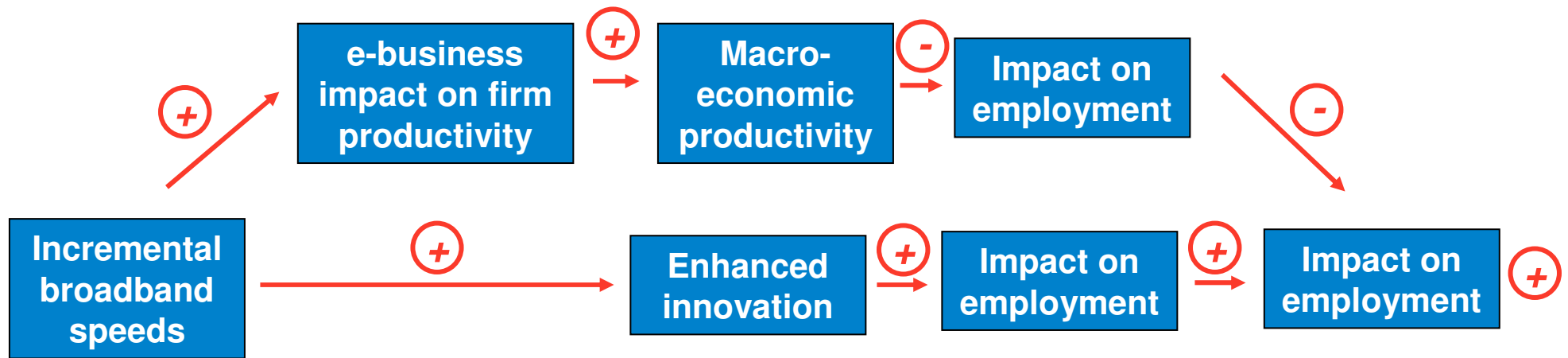
DIFFUSION POINT	EVIDENCE
Critical mass threshold	<ul style="list-style-type: none"> •Roller and Waverman (2001) •Shiu and Lam (2008)
Saturation	<ul style="list-style-type: none"> •Lehr et al (2006) •Atkinson et al (2009) •Katz et al. (2009)

Latin America is a the point where employment creation effects of broadband is high



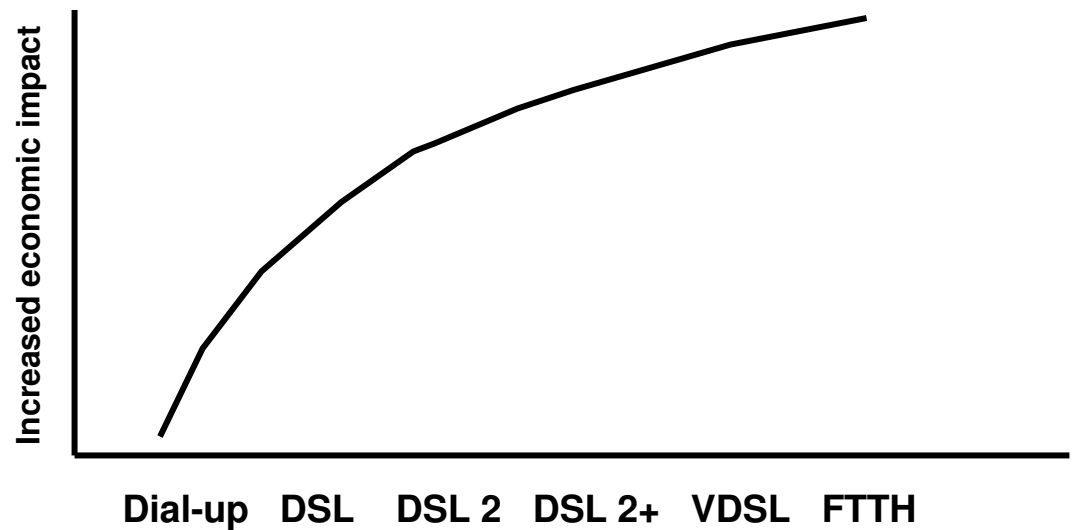
Source: Katz (2009)

Finally, we are starting to generate evidence in terms of socio-economic of NGAN



Application	Download speeds		
	500 Kbps	5 Mbps	50 Mbps
Google home page	0.3 sec	0.03 sec	0.003 sec
10 Mbs worksheet	150 sec	16 sec	1.6 sec
High quality videostreaming	Very low resolution	Medium resolution	High resolution

Source: SQW (2006)



In conclusion, the crisis is starting to impact the telecommunications industry but effects are region-specific

- Because of high penetration levels, the wireless industry will play a key role in the short and medium term
 - Key platform in meeting the broadband challenge
 - Enabled by prepaid broadband plans oriented to hybrid and prepaid customers
- Capex reduction, prompted by macroeconomic conditions and credit crunch, has anticipated changes in consumption
- Governments in the region are still reluctant, with few exceptions, to consider telecoms and ICT as a key tool in fighting the economic crisis
- Employment effects of potential stimulus programs could be important

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Implications for Europe

Long-term demand trends	<ul style="list-style-type: none">• Role of wireless technologies in filling up the broadband coverage gap• Where should we emphasize broadband and ICT deployment targets: universal coverage or core development areas?• Critical need to focus on SME ICT adoption
Industry structure	<ul style="list-style-type: none">• Consolidation into an oligopolistic market structure does not seem to have a significant negative impact on welfare effects• Regional integration in Latin America appears to be a viable model for European wireline cross-border consolidation
Crisis and stimulus program	<ul style="list-style-type: none">• Wireless should be affected on usage side (MOU trend is also present in Europe)• Broadband penetration in Europe might insulate sector from crisis• Capex behavior of carriers would be consistent across geographies• Broadband stimulus economic effects would be clear regarding infrastructure construction and externalities in low penetration areas• Key question is effect of enhanced speeds in high penetration areas

