

ADDRESSING THE NEXT CHALLENGES IN BROADBAND POLICY

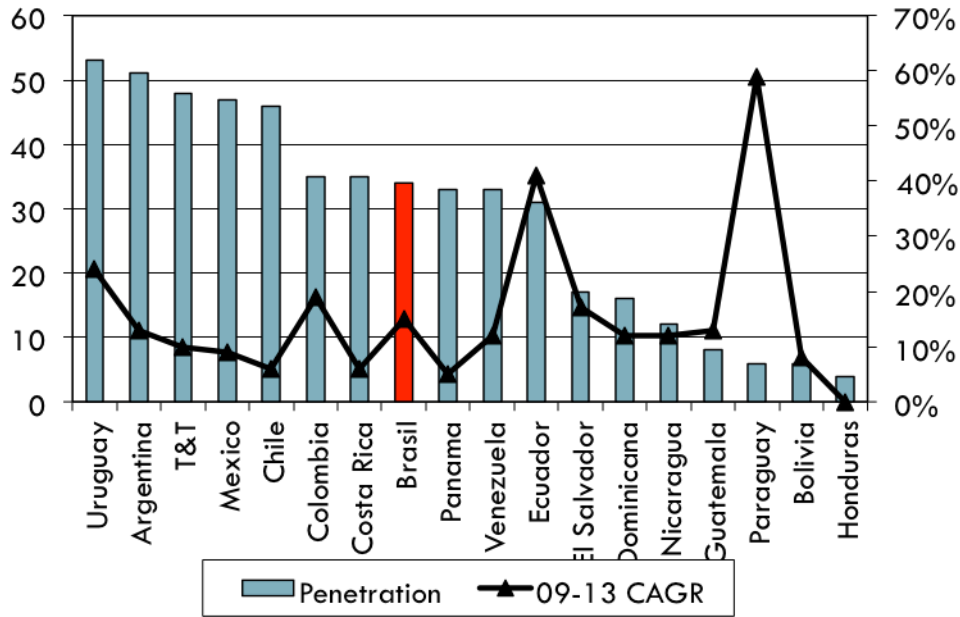
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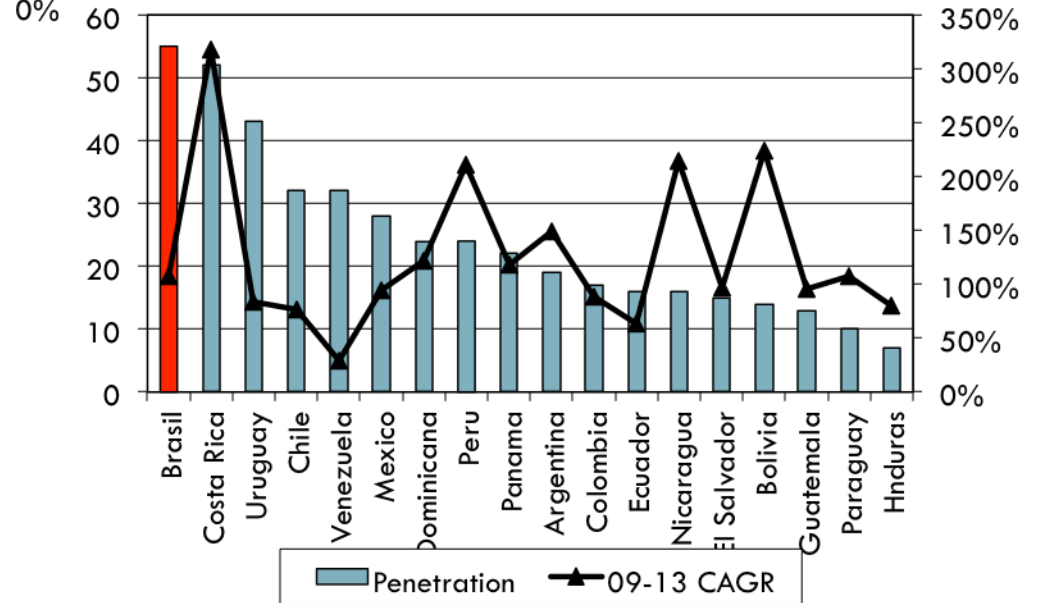
BRAZIL – AND LATIN AMERICA – HAS ACHIEVED SUBSTANTIAL PROGRESS IN THE DEPLOYMENT AND ADOPTION OF BROADBAND IN THE PAST YEARS

FIXED BROADBAND PENETRATION PER HOUSEHOLD AND GROWTH



Source: ITU; TAS analysis

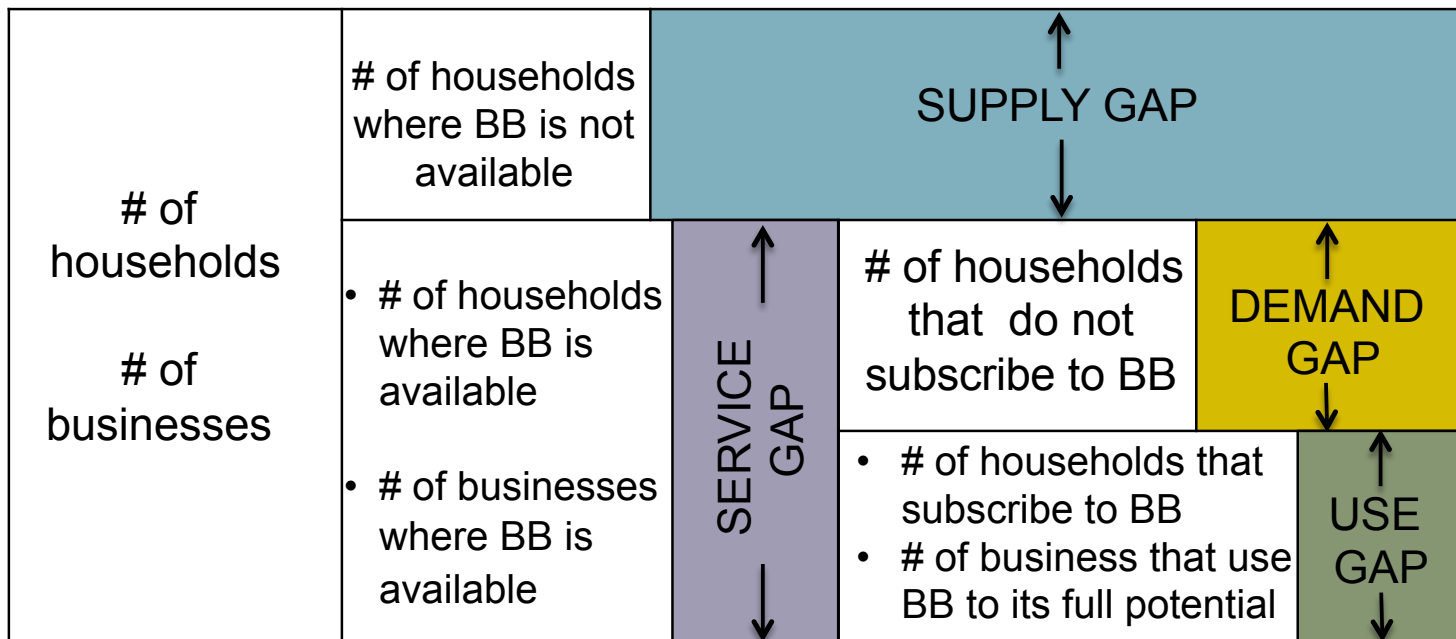
MOBILE BROADBAND PENETRATION PER INDIVIDUAL AND GROWTH



Source: GSMA Intelligence; TAS analysis

HOWEVER, SEVERAL CHALLENGES REMAIN AHEAD: EACH ONE HAS PUBLIC POLICY IMPLICATIONS

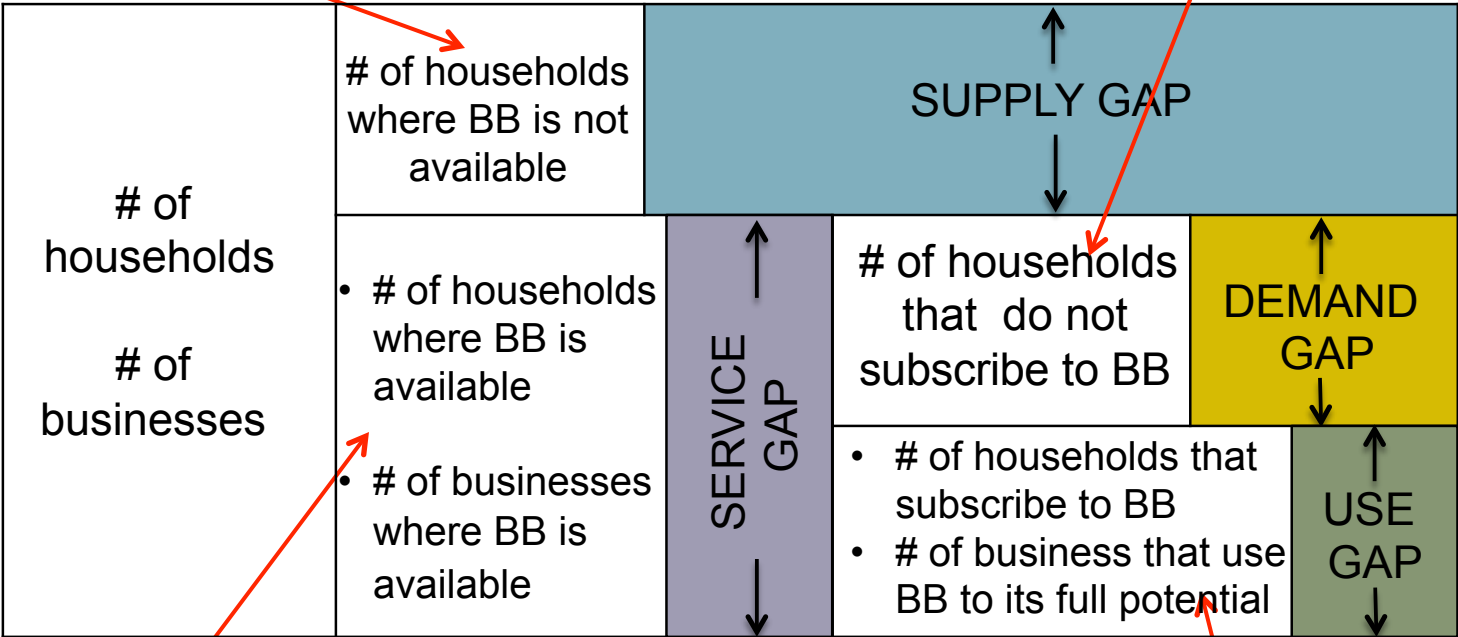
LATIN AMERICAN BROADBAND: GAPS THAT STILL NEED TO BE ADDRESSED



THE CHALLENGES REPRESENT THE FOUR POLICY AXES OF THE NEXT STAGE OF THE BROADBAND NATIONAL STRATEGY

SUPPLY GAP: How do we make sure that all households are served by broadband?

DEMAND GAP: How do we make sure that households that could purchase broadband do so?



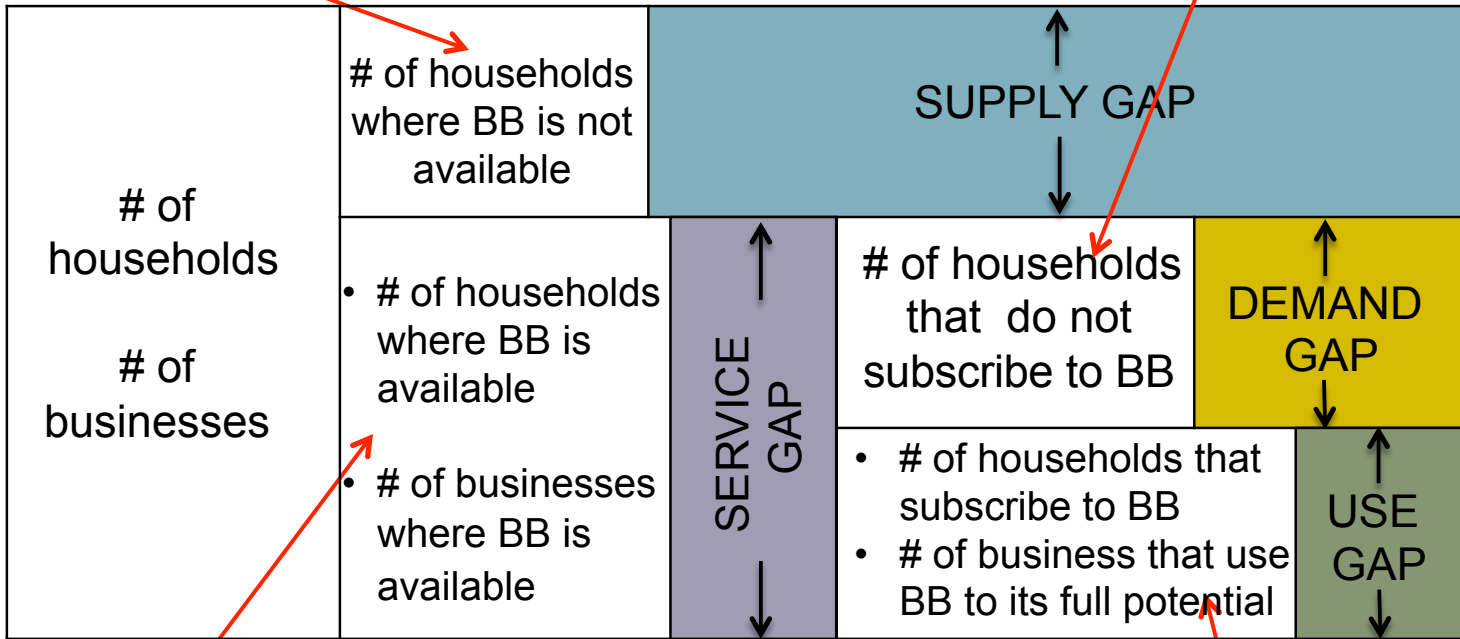
SERVICE GAP: How do we make sure that all households and businesses are served by adequate broadband speed and service?

UTILIZATION GAP: How do we make sure that businesses use broadband in order to maximize its economic impact?

FIRST AND FOREMOST, BRAZIL NEEDS TO ADDRESS THE BROADBAND DEMAND GAP

SUPPLY GAP: How do we make sure that all households are served by broadband?

DEMAND GAP: How do we make sure that households that could purchase broadband do so?



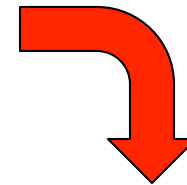
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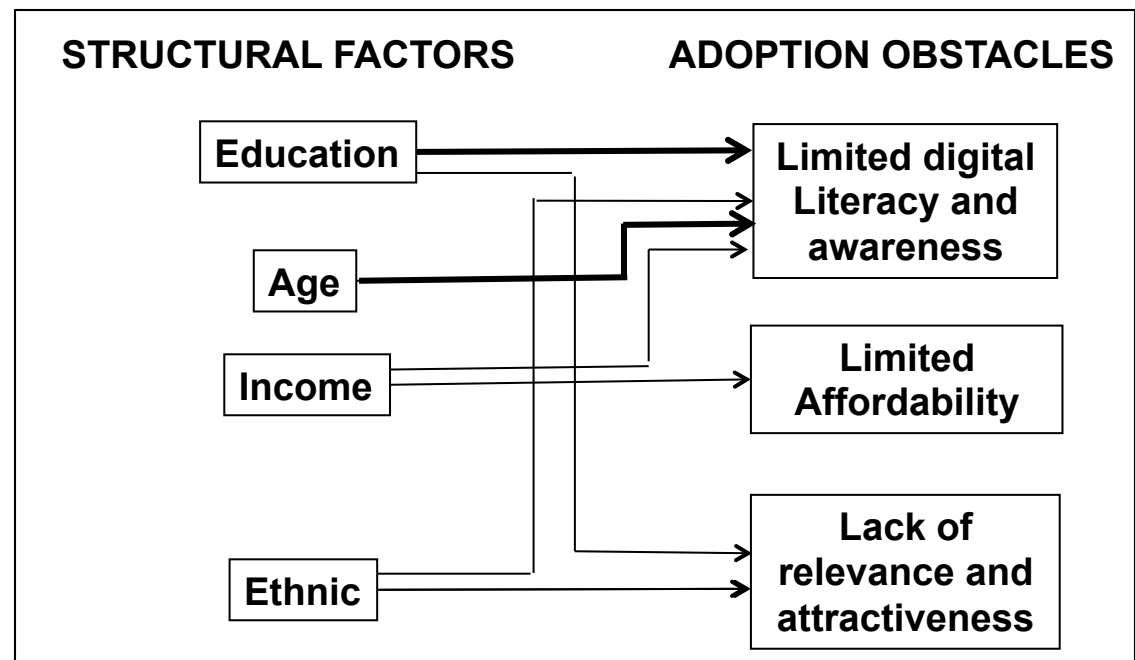
THE DEMAND GAP IS A FUNCTION OF THREE FACTORS: DIGITAL LITERACY, AFFORDABILITY, AND CONTENT RELEVANCE

BRASIL: BROADBAND DEMAND GAP

Service	Coverage	Penetration	Demand Gap
Fixed Broadband	100 %	34 % of households	66 % of households
Mobile Broadband	91 %	55 % of individuals	36 % of individuals

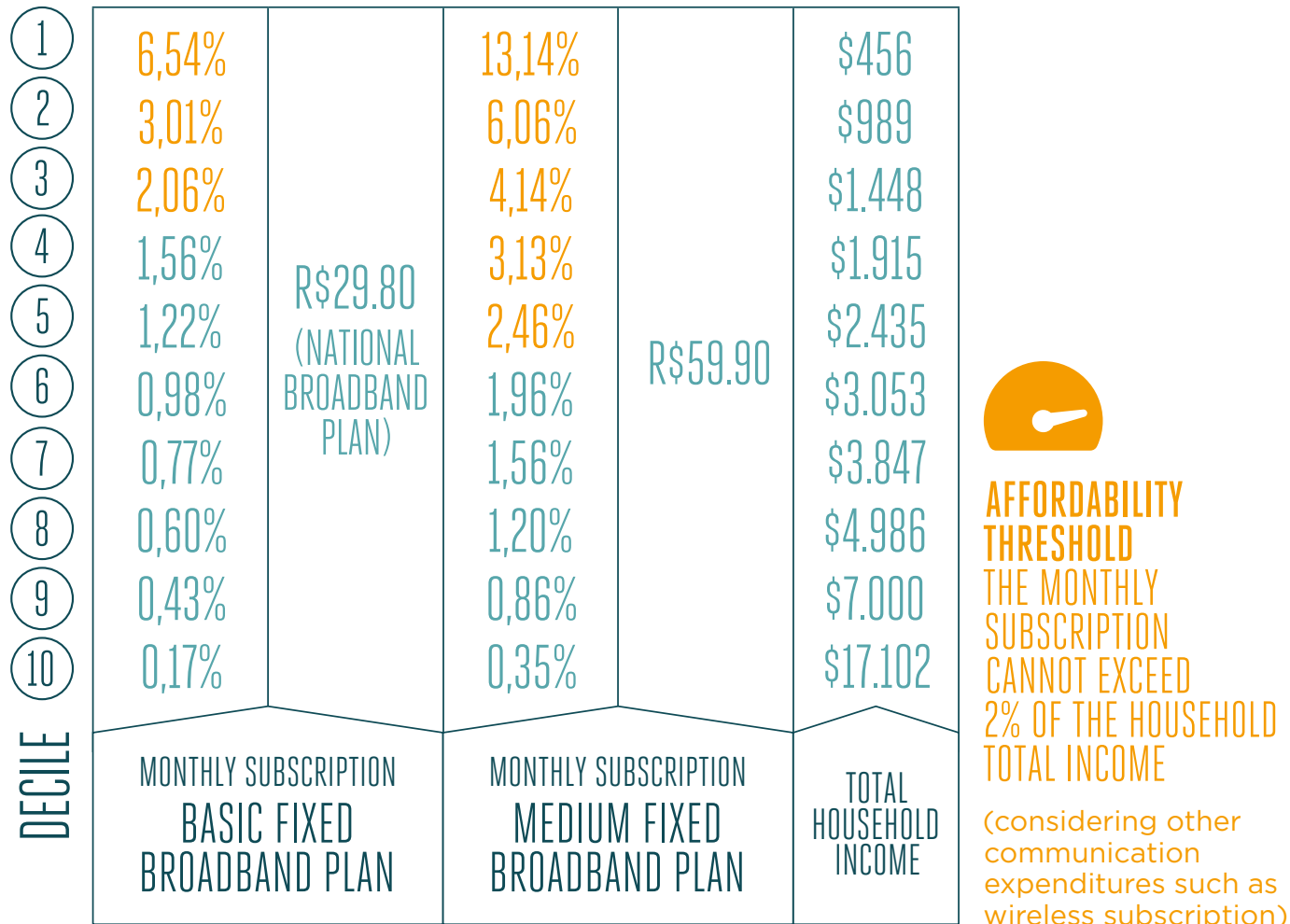


Sources: Anatel; GSMA Intelligence; ITU; TAS analysis



FOR EXAMPLE, EVEN WITH THE “BANDA LARGA POPULAR”, BROADBAND IN BRAZIL IS STILL NOT AFFORDABLE TO THE BOTTOM THREE DECILES OF THE SOCIO-DEMOGRAPHIC PYRAMID

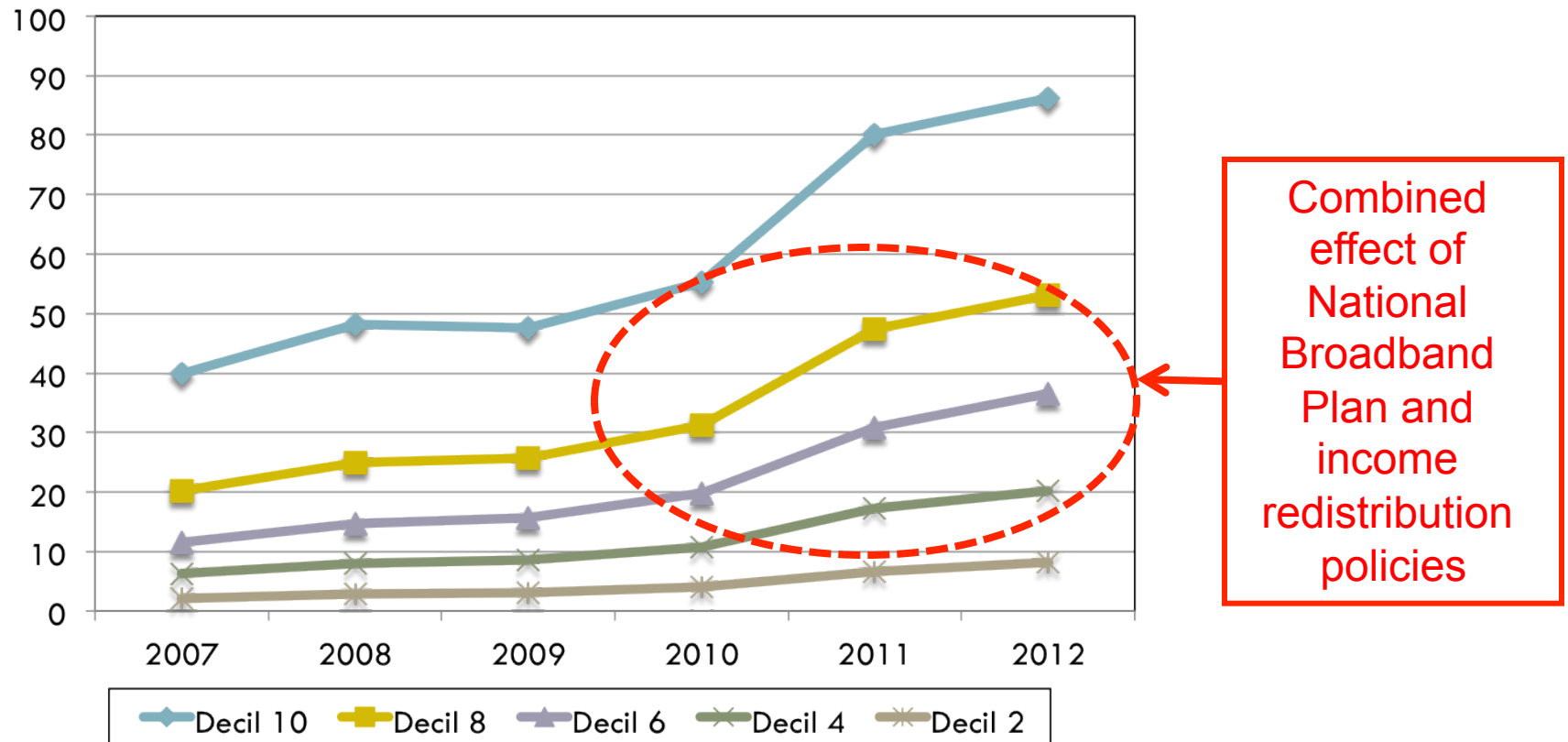
BRAZIL: BROADBAND AFFORDABILITY



Source: Katz and Callorda (2013)

THIS EXPLAINS HOW BROADBAND HAS BEEN INCREASINGLY ADOPTED BY THE MIDDLE CLASSES, WITHOUT REACHING THE BOTTOM OF THE PYRAMID

BRAZIL: FIXED BROADBAND PENETRATION BY INCOME DECILE (%)



Source: Euromonitor (2012); TAS analysis

ON THE OTHER HAND, MOBILE BROADBAND HAS BEEN THE PRODUCT THAT HAS ENHANCED AFFORDABILITY AND CLOSED THE BRAZILIAN DEMAND GAP

BRAZIL: AFFORDABILITY OF MOBILE BROADBAND

The daily pe-paid mobile broadband offer for eight days allows increasing affordability up to the second decile

The launch of a “popular mobile broadband” will increase affordability by two deciles without imposing a temporal limitation

①	\$456	150MB FOR 2 DAYS (R\$2.99)* 4 + (COST OF MODEM (R\$119) /18 MONTHS)	4,07%
②	\$989		1,88%
③	\$1.448		1,28%
④	\$1.915		0,97%
⑤	\$2.435		0,76%
⑥	\$3.053		0,61%
⑦	\$3.847		0,48%
⑧	\$4.986		0,37%
⑨	\$7.000		0,27%
⑩	\$17.102		0,11%
TOTAL HOUSEHOLD INCOME		COST	PERCENTAGE OF MONTHLY SUBSCRIPTION

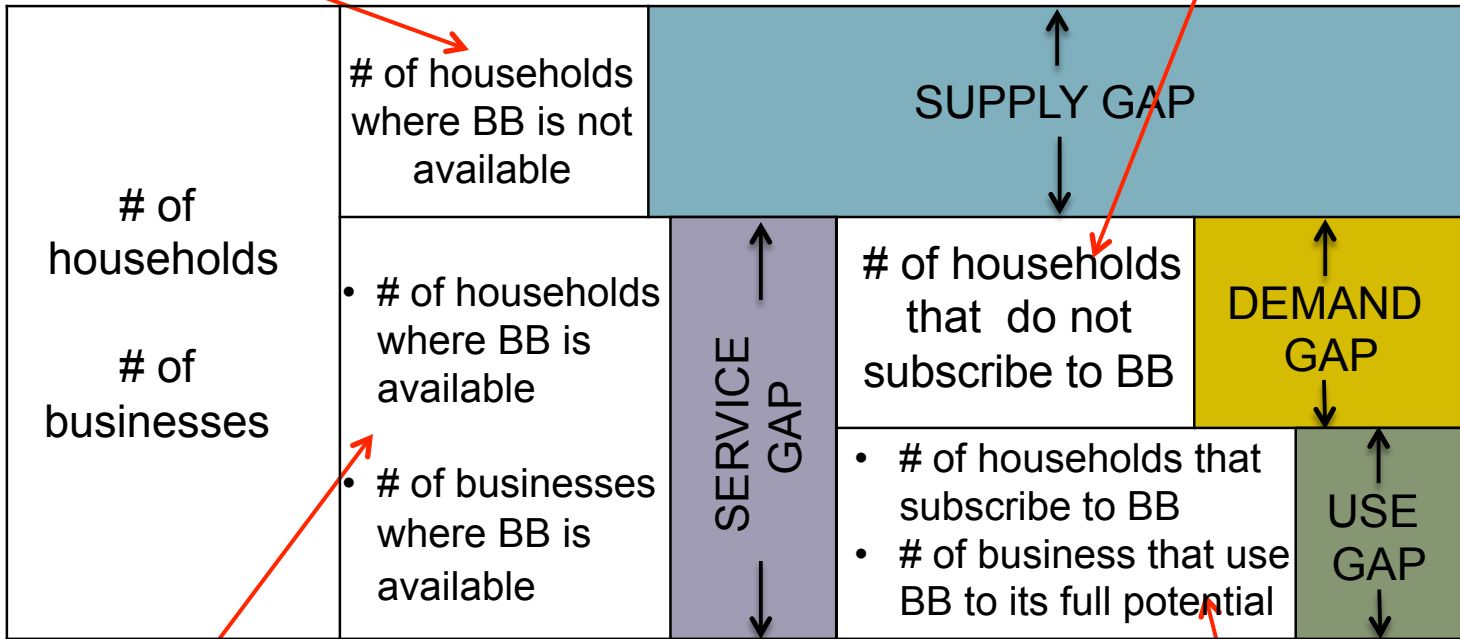
①	\$456	MONTHLY COST R\$19.80 + (COST OF MODEM (R\$0) /18 MONTHS)	4.34%
②	\$989		2.00%
③	\$1.448		1.37%
④	\$1.915		1.03%
⑤	\$2.435		0.81%
⑥	\$3.053		0.65%
⑦	\$3.847		0.51%
⑧	\$4.986		0.40%
⑨	\$7.000		0.28%
⑩	\$17.102		0.12%
TOTAL HOUSEHOLD INCOME		MONTHLY SUBSCRIPTION	

Source: IBGE; TAS analysis

BEYOND THE DEMAND GAP, COVERAGE STILL EXHIBITS SHORTFALLS

SUPPLY GAP: How do we make sure that all households are served by broadband?

DEMAND GAP: How do we make sure that households that could purchase broadband do so?

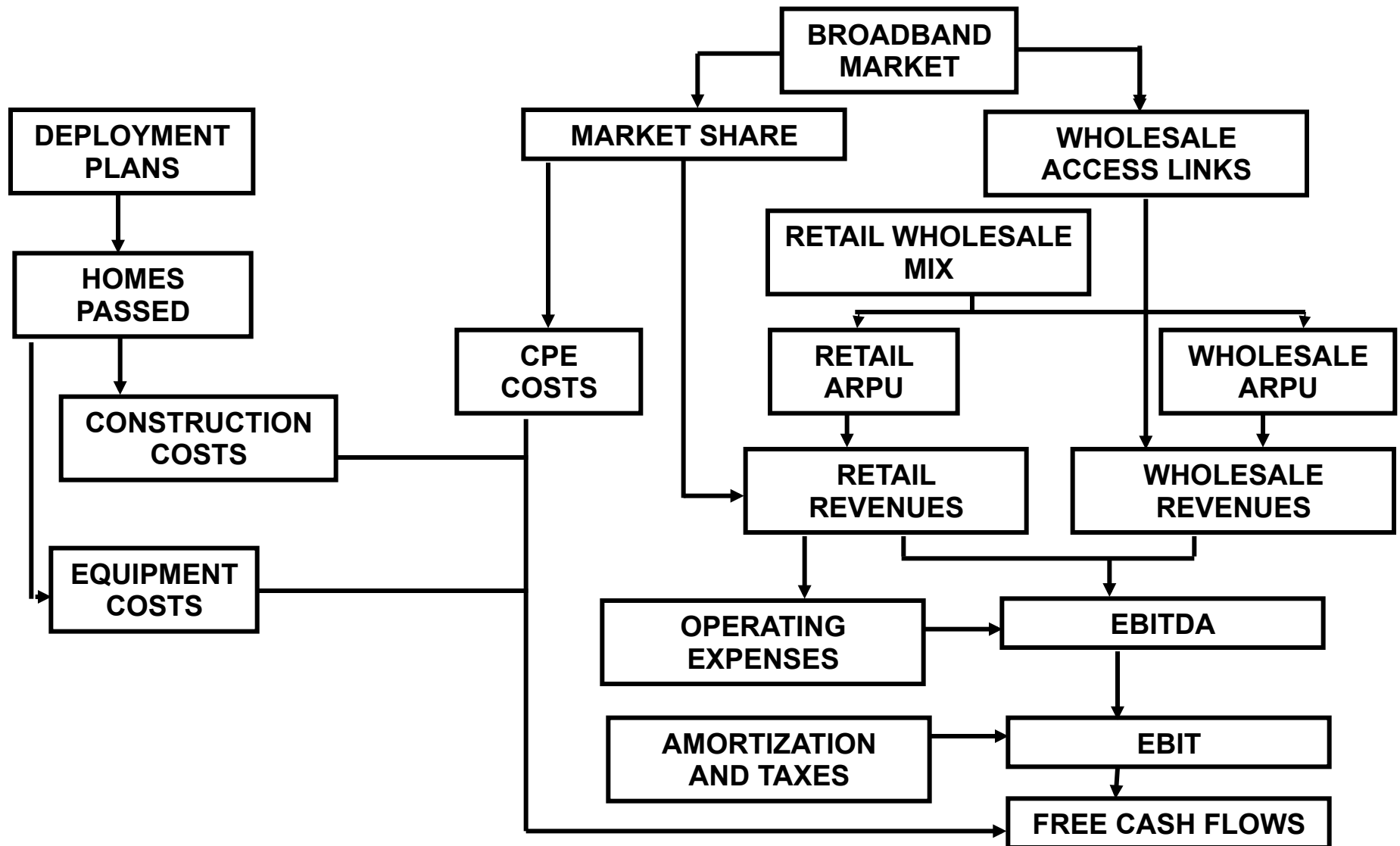


SERVICE GAP: How do we make sure that all households and businesses are served by adequate broadband speed and service?

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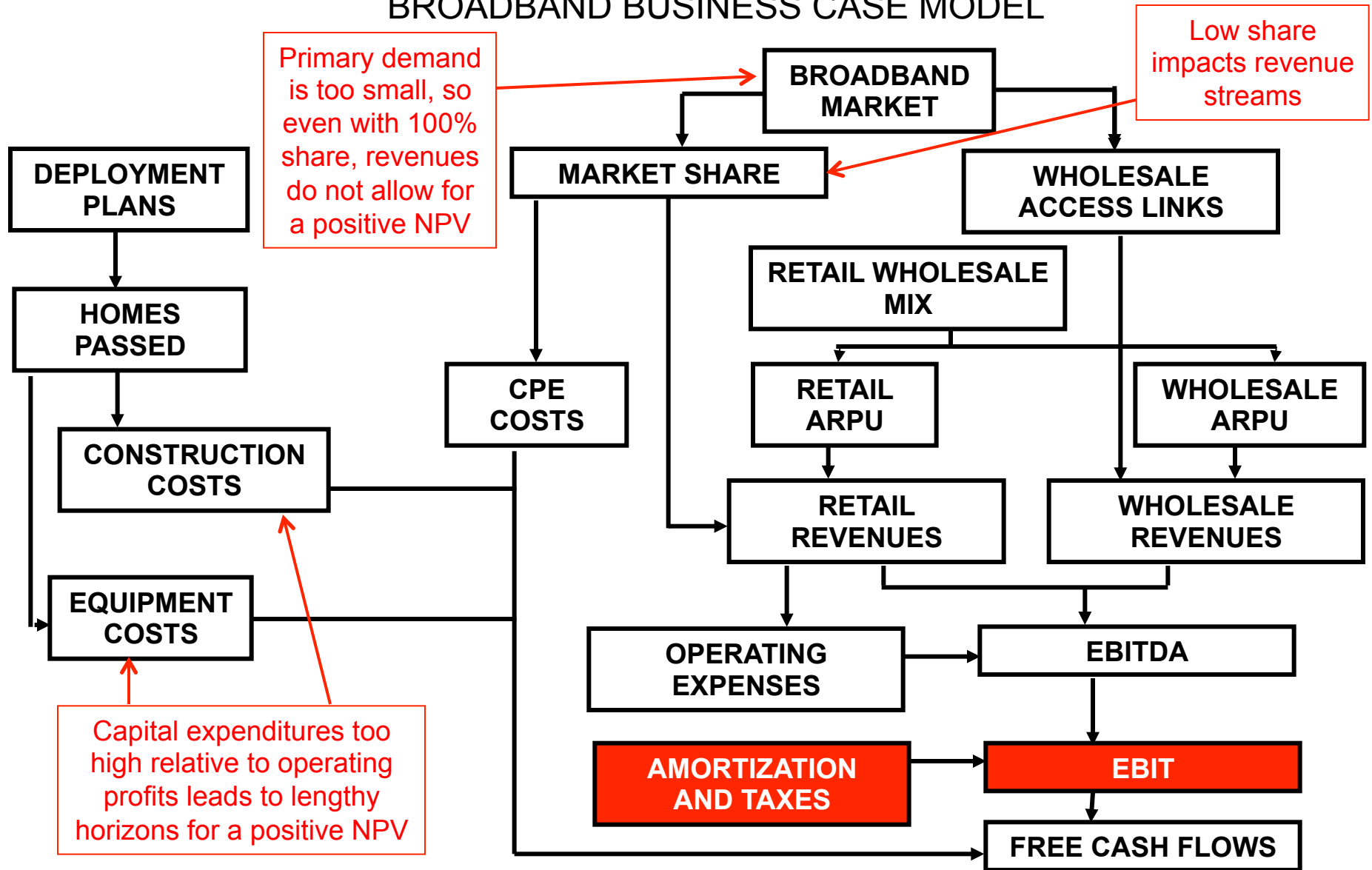
TO ASSESS THE ROLE OF POLICY INITIATIVES IN ADDRESSING THE SUPPLY GAP WE SHOULD BEGIN BY EXAMINING THE STRUCTURE AND DRIVERS OF THE BUSINESS CASE

BROADBAND BUSINESS CASE MODEL



FOR EXAMPLE, TAXATION ON PURCHASING OF CAPITAL EQUIPMENT BECOMES HIGHLY RELEVANT UNDER CONDITIONS OF A CONSTRAINED BUSINESS CASE

BROADBAND BUSINESS CASE MODEL



ANALYSIS OF HISTORICAL DATA IN THE US SHOWS THAT A DECREASE OF 1 PERCENTAGE POINT IN THE TAX RATE INCREASES INVESTMENT IN CABLE TV BY \$0.31 PER CAPITA AND \$0.85 IN TELECOM

Independent Variables: Sales Tax Rate, Median Income, Population, Human Capital, Rural Population, Investment lagged, Age of Population

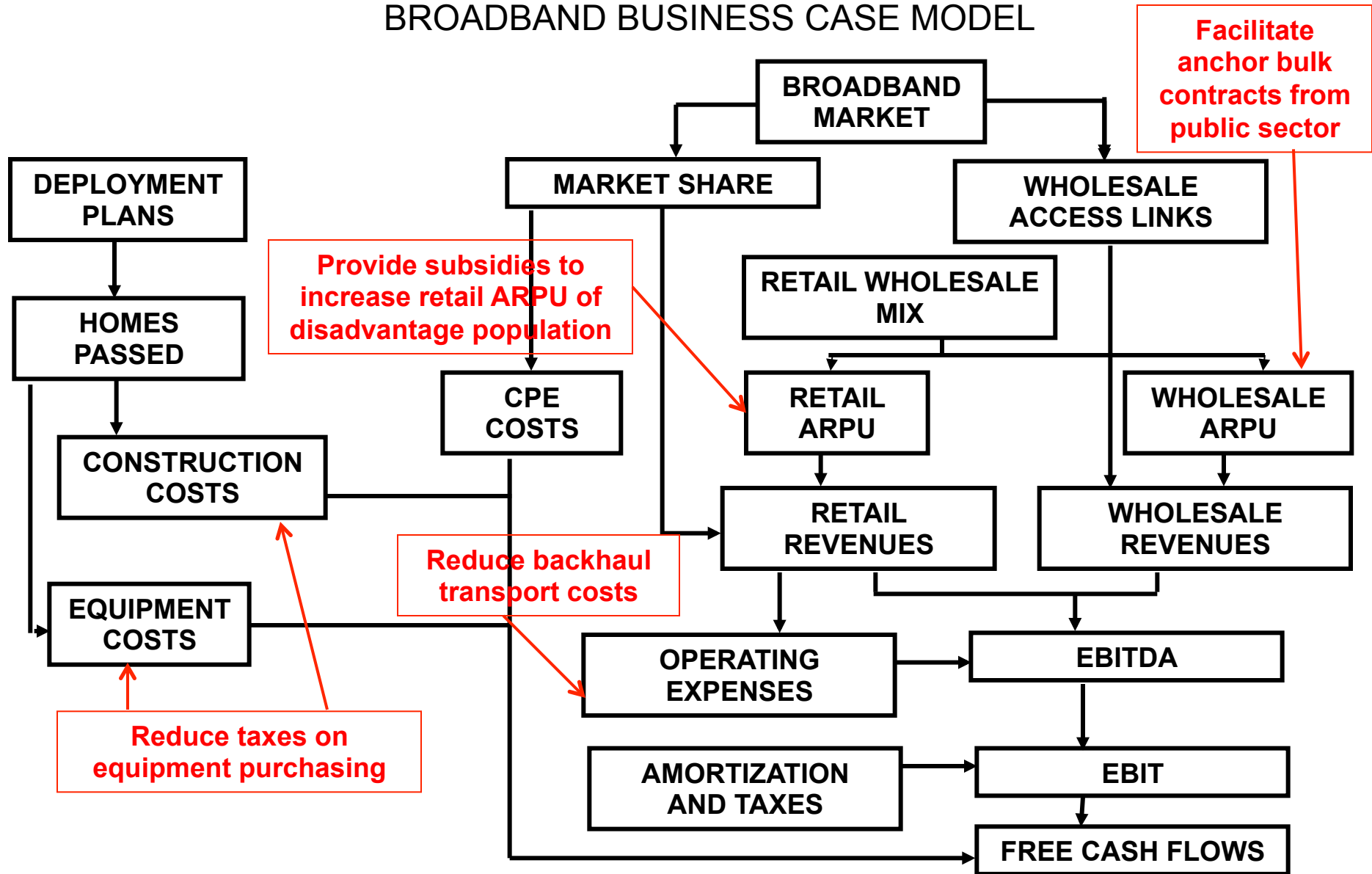
<i>Dependent Variable</i>	Cable Investment		Wireless & Wireline Investment	
Sales Tax Rate	-0.3085	*	-0.8529	*
	(0.1586)		(0.5142)	
Median Income (2010 Dollars)	-0.1655		0.5817	*
	(0.1239)		(0.3524)	
Population	0.2508	**	-0.3662	
	(0.0984)		(0.2690)	
Human Capital	0.2382		0.2689	
	(0.1893)		(0.5602)	
Rural Population	-0.0936	**	-0.0620	
	(0.0441)		(0.1461)	
Investment the last year	0.5019	***	0.4375	***
	(0.0465)		(0.0408)	
60 years or more	-0.3200		-8.7256	
	(0.8200)		(6.3690)	
Between 20/34 years	-0.5230		-3.8209	
	(1.2667)		(6.7247)	
Between 5/19 years	-0.8622		-6.9562	*
	(0.6340)		(3.5852)	
Constant	28.6410		434.7922	
	(47.9686)		(301.4056)	
R ²	0.7984		0.4808	
F (9,190)	50.99		37.61	
Prob > F	0.0000		0.0000	
Number of Observations	200		200	

Note: ***, **, * significance at 1%, 5% & 10% level

Source: TAS analysis

SEVERAL POLICY INITIATIVES, IN ADDITION TO A REDUCTION OF TAXES, CAN ALLEVIATE THE “CHOKE POINTS” OF A CONSTRAINED BUSINESS CASE

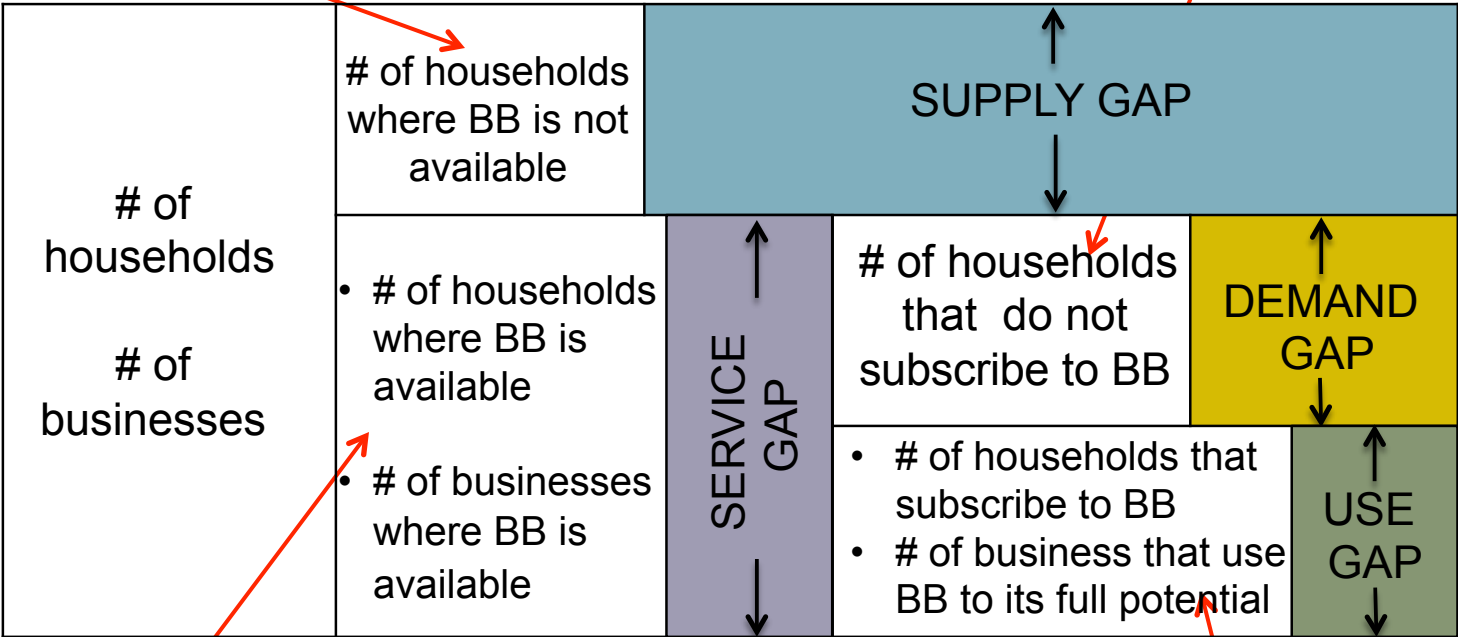
BROADBAND BUSINESS CASE MODEL



THIRDLY, SERVICE QUALITY TO THE COVERD AREAS NEEDS TO BE UPGRADED TO MEET EMERGING DEMANDS

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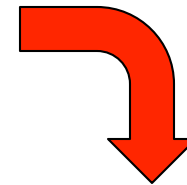
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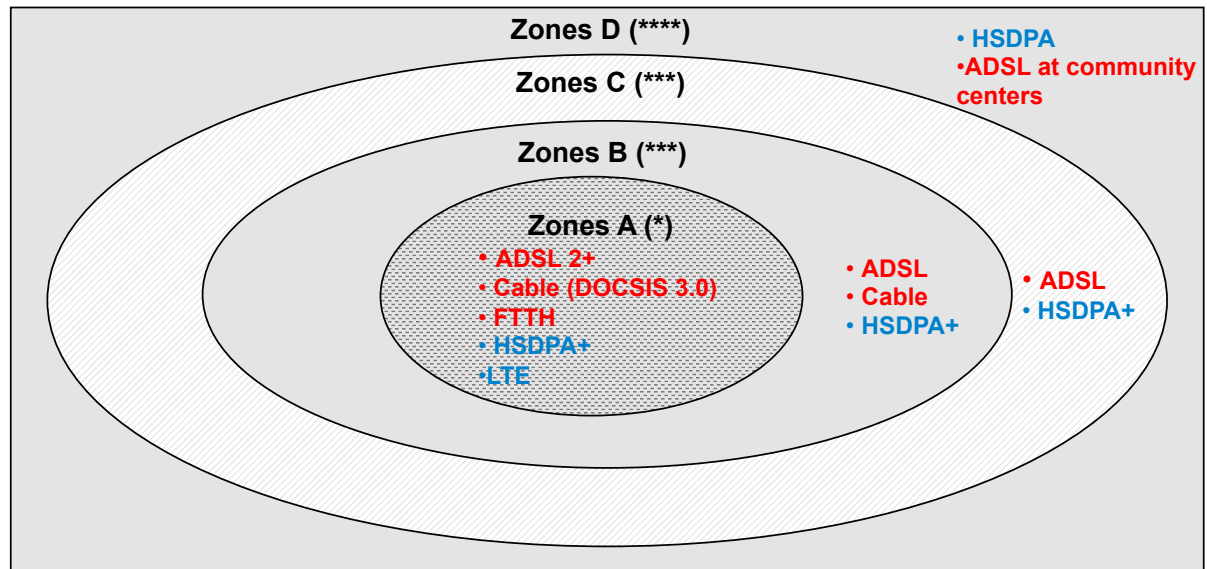
AVERAGE BROADBAND SPEED HAS SO FAR INCREASED MARGINALLY, WHICH REQUIRES AN ACCELERATED MIGRATION TO NEXT GENERATION TECHNOLOGIES

BRASIL: AVERAGE BROADBAND SPEED (Mbps)

Service	1Q12	1Q13	1Q14
Fixed Broadband	2.2	2.3	2.6
Mobile Broadband	1.122	1.100	0.286

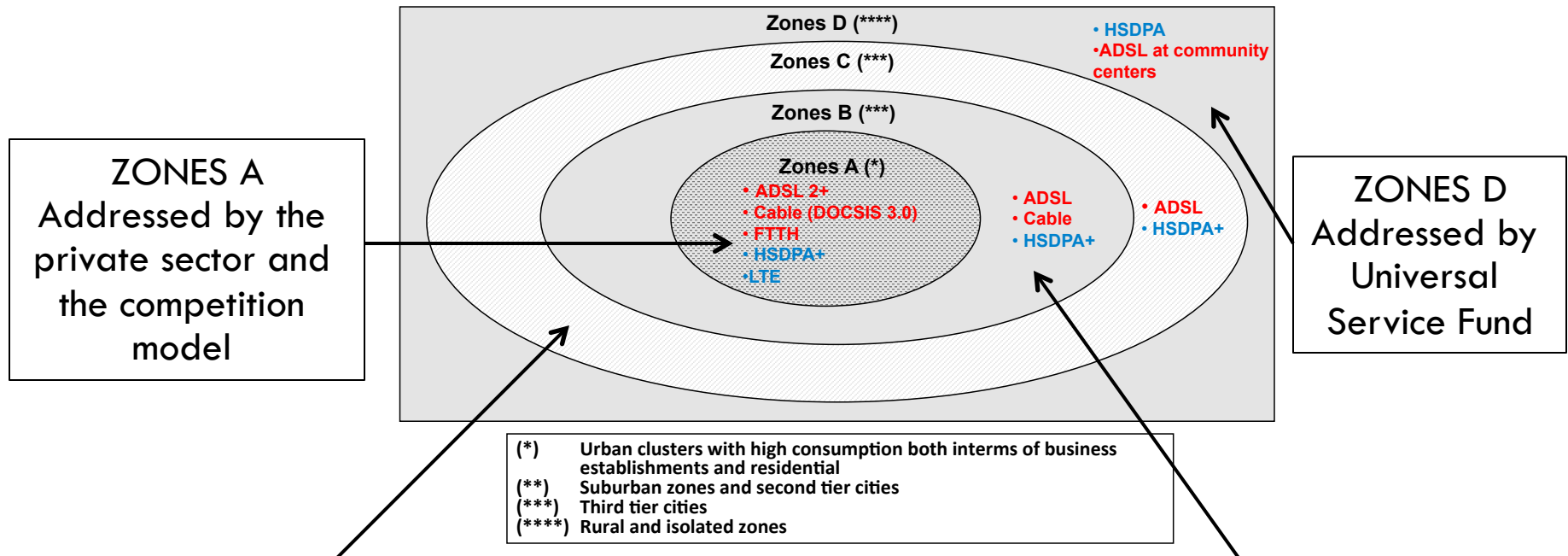


Sources: Akamai; NetIndex; TAS analysis



(*) Urban clusters with high consumption both interms of business establishments and residential
 (**) Suburban zones and second tier cities
 (***) Third tier cities
 (****) Rural and isolated zones

THE SERVICE GAP CHALLENGE IN BRAZIL BASICALLY REPRESENTS AN INVESTMENT HURDLE



BRAZIL ZONES B and C: FTTH INVESTMENT

	< 15,000 population	15-30,000 population	30-100,000 population	Total
# of districts	338	473	473	1,284
Population	3,788,000	10,133,000	26,277,000	40,147,000
CAPEX (US\$ Million)	\$ 521	\$ 1,127	\$ 2,195	\$ 3,843
Investment per project (\$ '000)	\$ 1.540	\$ 2,383	\$ 4,641	\$ 3,000

- Districts served by small operators
- Cannot access c(average CAPEX: US\$ 3 million)
- Credit lines from the BNDES, which could be more suited to this type of funding, are on-lent by commercial banks that are reluctant to lend to these projects due to perceptions of high risk
- Even under attractivhe busines case ratioss, risk is too high for lenders

Source: ABRINT; TAS analysis

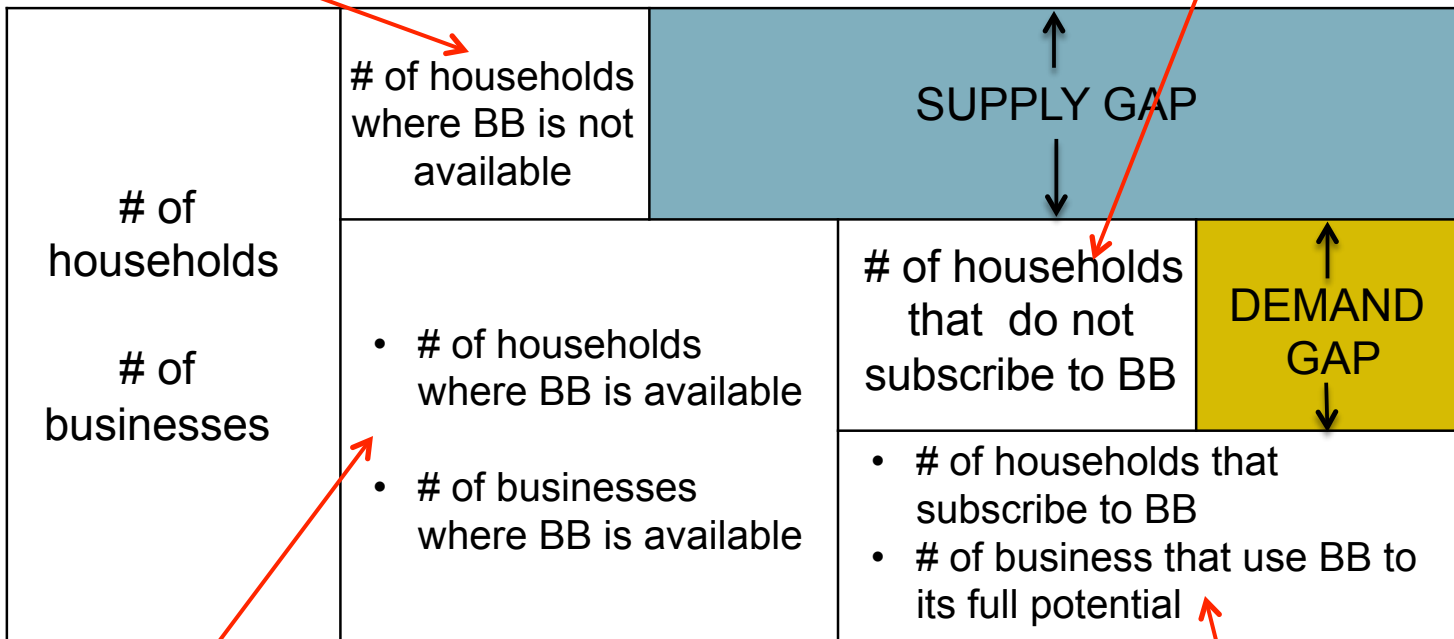
THE INVESTMENT HURDLE TO DEPLOY FTTH TO SMALL MUNICIPALITIES NEEDS TO BE ADDRESSED THROUGH INNOVATIVE FINANCIAL STRATEGIES

- Structuring of trusts or special purpose vehicles
- Capable of attracting local sources of funds
- Supported by a menu of credit enhancements (cashflow over-collateralization, grants pledged as collateral, transfer intercepts, partial credit guarantees)
- Streamlined application process
- Longer tenors, lower rates than commercial banks

FINALLY, ECONOMIC IMPACT OF BROADBAND CAN ONLY BE ENHANCED BY IMPROVING ITS UTILIZATION BY SMALL AND MEDIUM ENTERPRISES

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BRAZILIAN STATISTICS INDICATE AN IMPROVING BUT YET LAGGING THE ICT UTILIZATION GAP

BRAZILIAN SMALL AND MEDIUM ENTERPRISES

- Usage gap: 30% of SMEs use e-Commerce
- Generational gap: 41% of SMEs using e-Commerce were created after 2013
- Geographic gap: 84% of adopting SMEs are in the Southeast and the South

Source: SEBRAE E-Commerce Brasil, 2014

BRAZILIAN SMALL ENTERPRISES

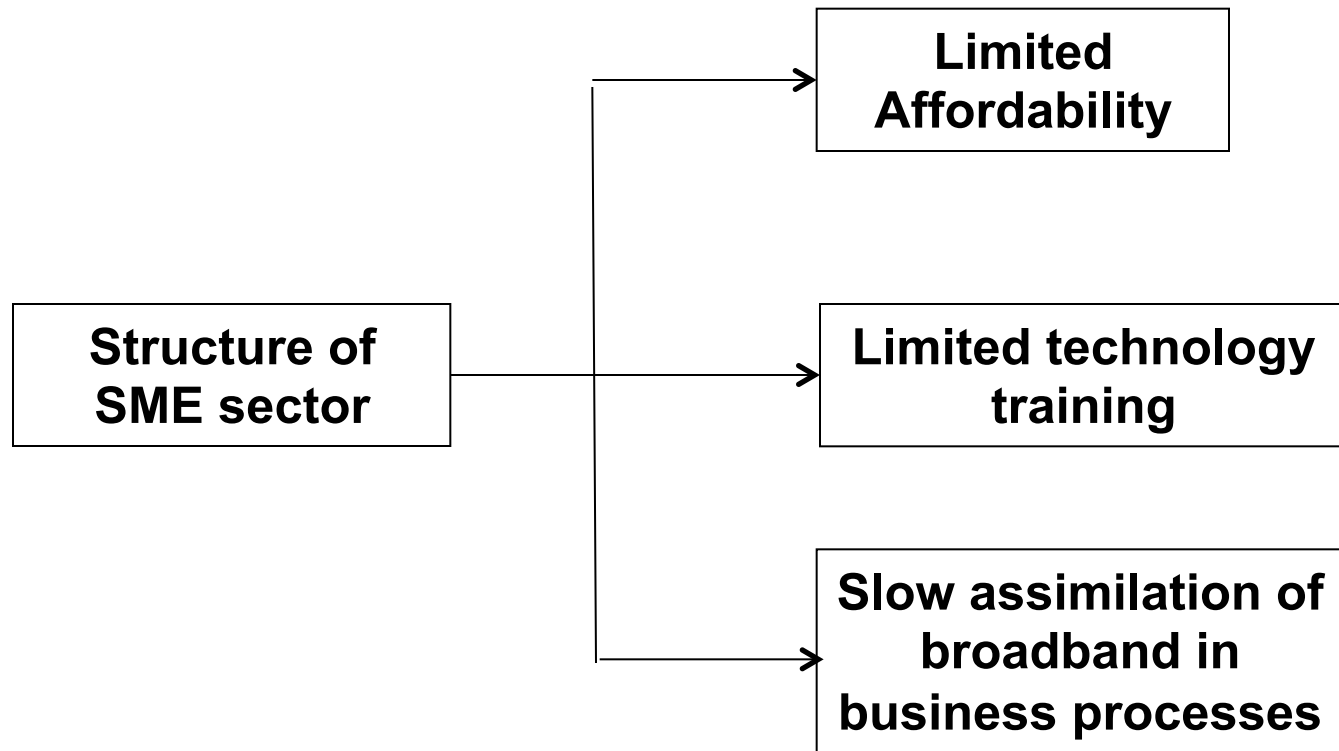
- 66% of use Internet to handle transactions with government entities
- 83% use online banking for financial transactions
- 50% have a web page
- 56% rely on the Internet for managing their supply chain
- 11% receive orders on the Internet
- 35% have an Intranet

Source: Latin American Economic outlook, 2014

THE SMALL AND MEDIUM ENTERPRISES ICT UTILIZATION LAG IS THE RESULT OF THREE OBSTACLES

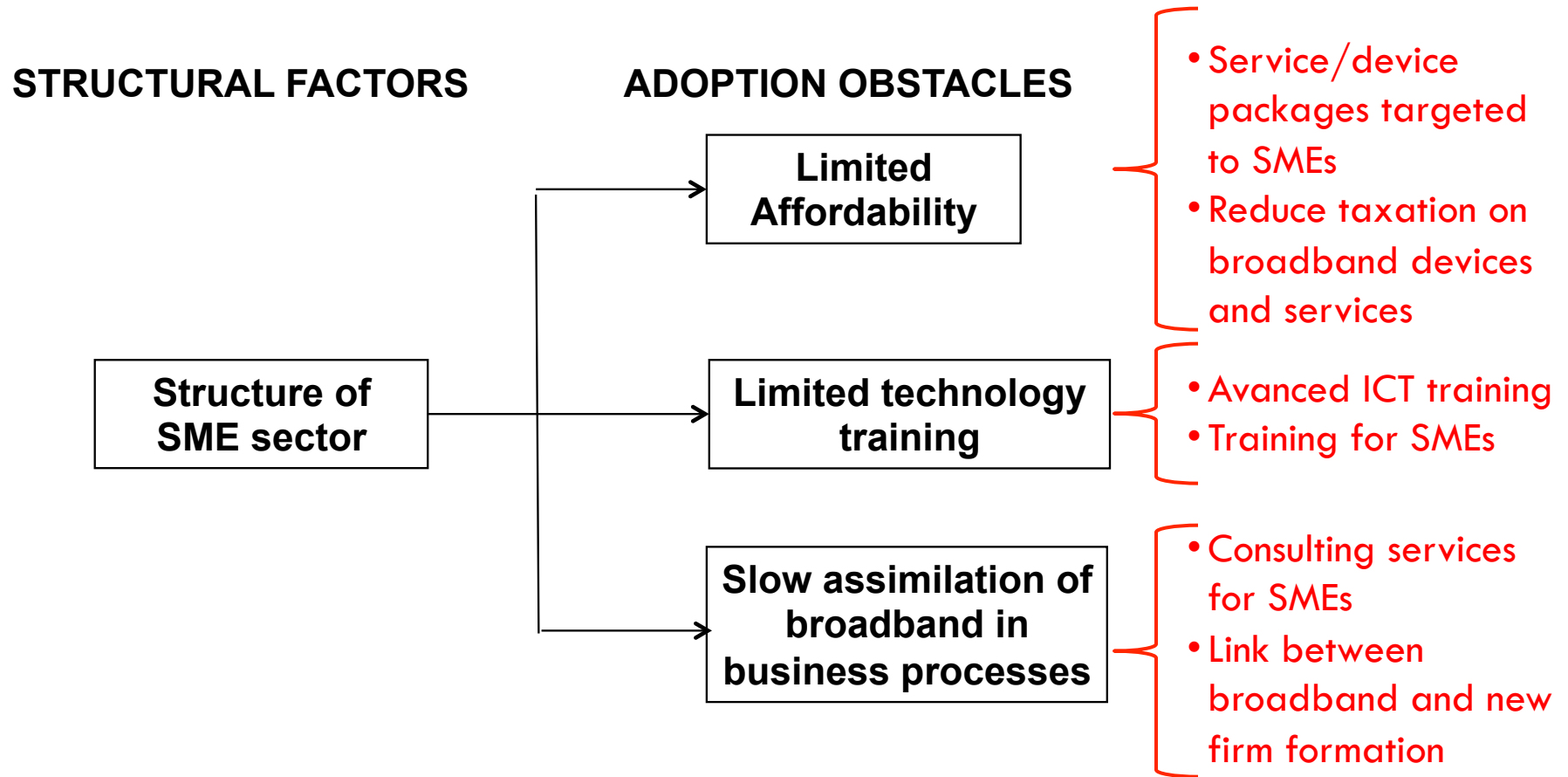
STRUCTURAL FACTORS

ADOPTION OBSTACLES



EACH OBSTACLE NEEDS TO BE TACKLED THROUGH A SET OF TARGETED PROGRAMS

PROGRAMS AIMED AT ENHANCING ICT UTILIZATION



IN CONCLUSION, THE NEXT STAGE OF THE BROADBAND NATIONAL STRATEGY REQUIRES THE IMPLEMENTATION OF A SET OF NEW POLICY INITIATIVES

Challenges	Initiatives
Demand Gap	<ul style="list-style-type: none"> • Social mobile broadband offering • Reduce taxation on broadband services • Accelerate digital literacy programs among disenfranchised population • Emphasize development of local content
Supply Gap	<ul style="list-style-type: none"> • Facilitate anchor bulk contracts from public sector • Provide subsidies to increase retail ARPU of disadvantage population • Reduce taxes on equipment purchasing • Reduce backhaul transport costs
Service Gap	<ul style="list-style-type: none"> • Focus on deployment of FTTH through a mix of private sector investment and structuring of trusts or special purpose vehicles for small communities
SME Utilization Gap	<ul style="list-style-type: none"> • Service/device packages targeted to SMEs • Reduce taxation on broadband devices and services • Advanced ICT training • Training for SMEs • Consulting services for SMEs • Link between broadband and new firm formation

TELECOM ADVISORY SERVICES, LLC

Nueva York – Buenos Aires – México D.F.

Para más información contactar a:

Raul Katz, raul.katz@teleadvs.com, +1 (845) 868-1653

Telecom Advisory Services LLC
182 Stissing Road
Stanfordville, New York 12581 USA