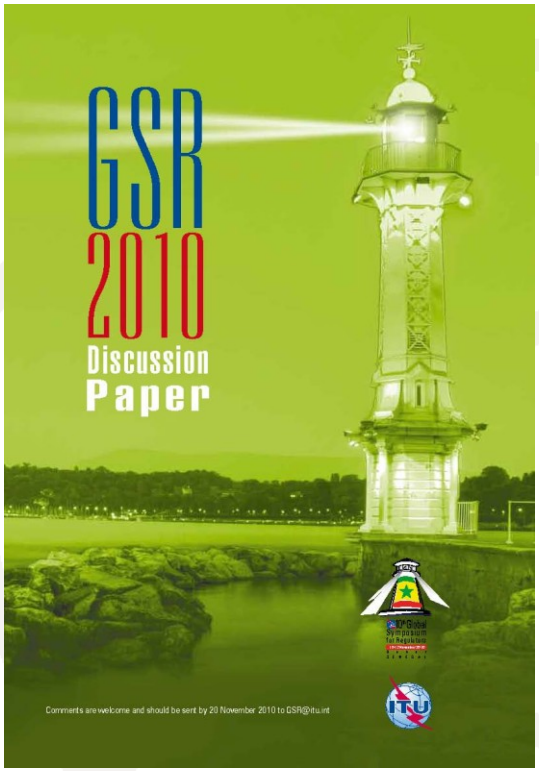

The Impact of Broadband on the Economy: Research to Date and Policy Issues

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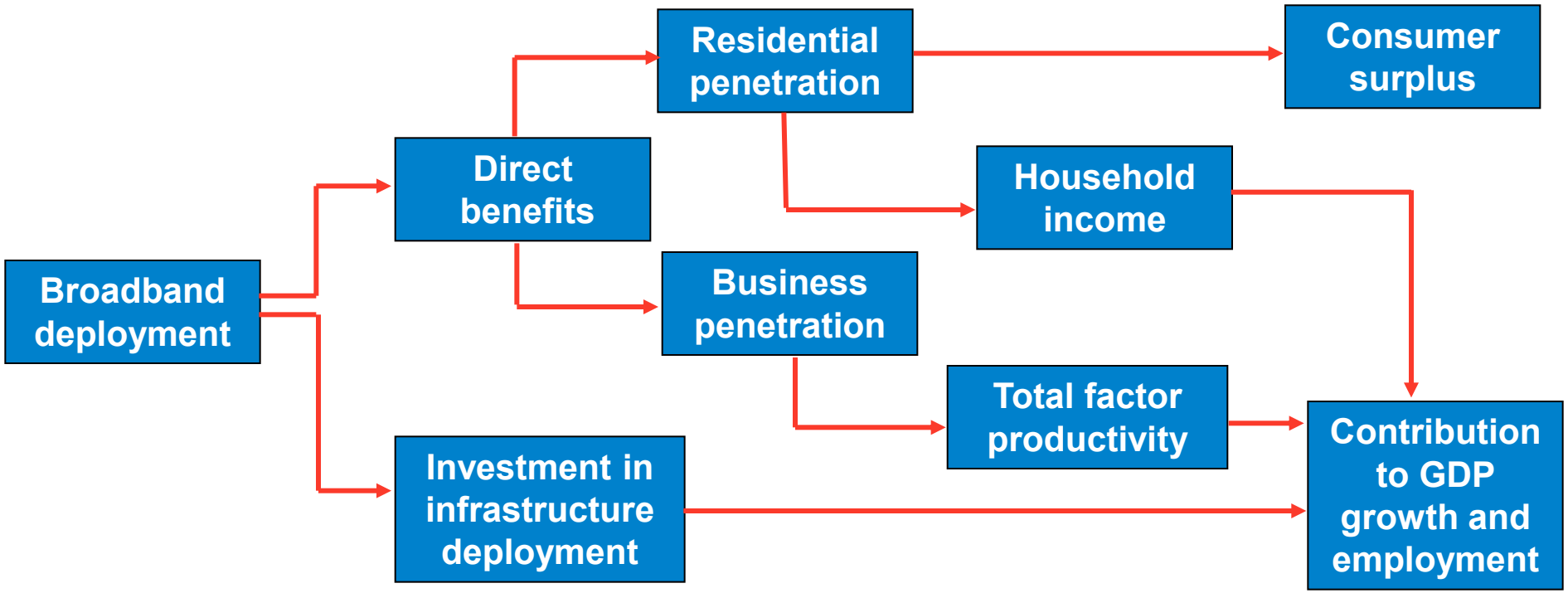
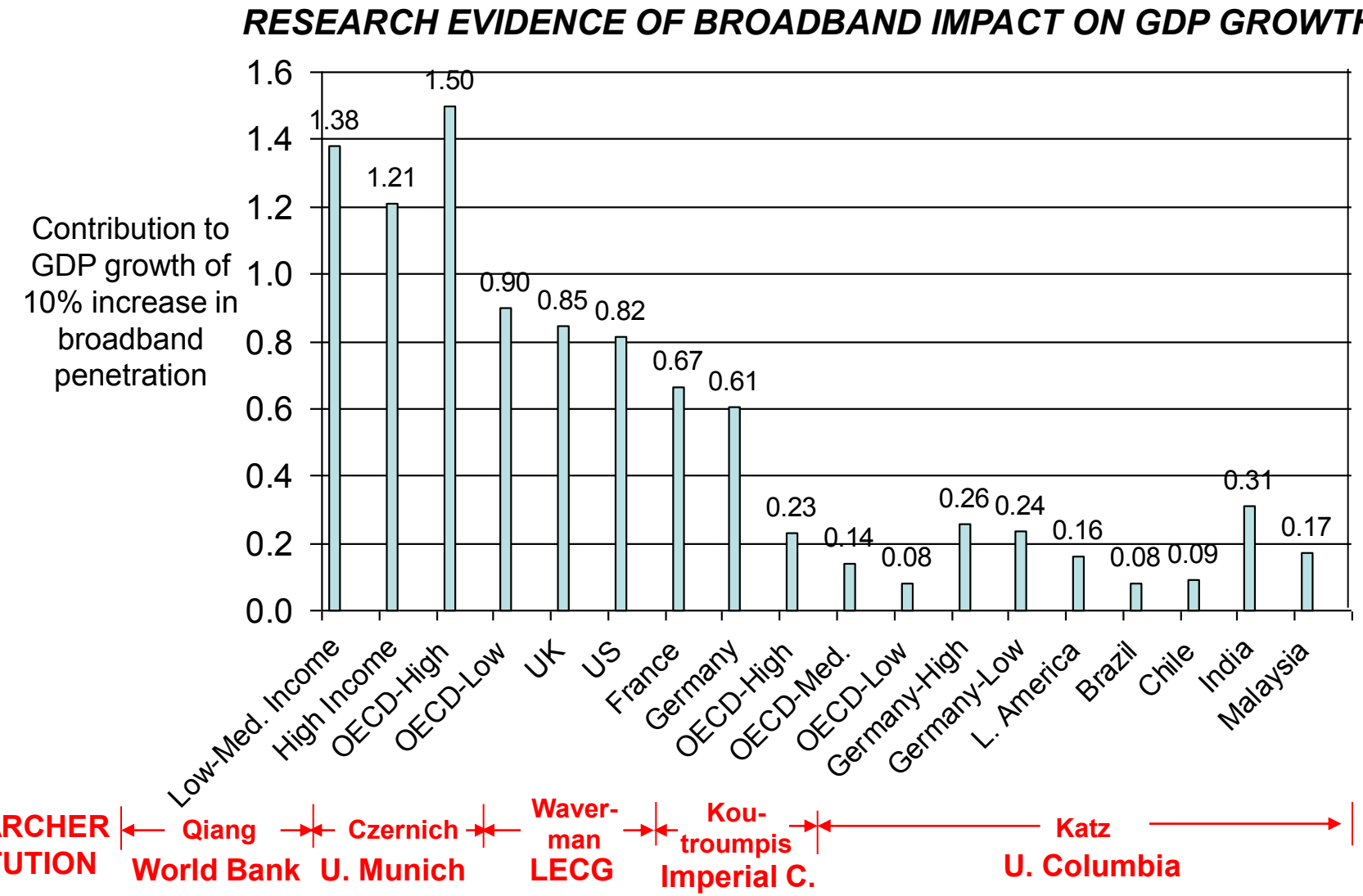
Broadband has multiple economic impacts

BROADBAND ECONOMIC IMPACT

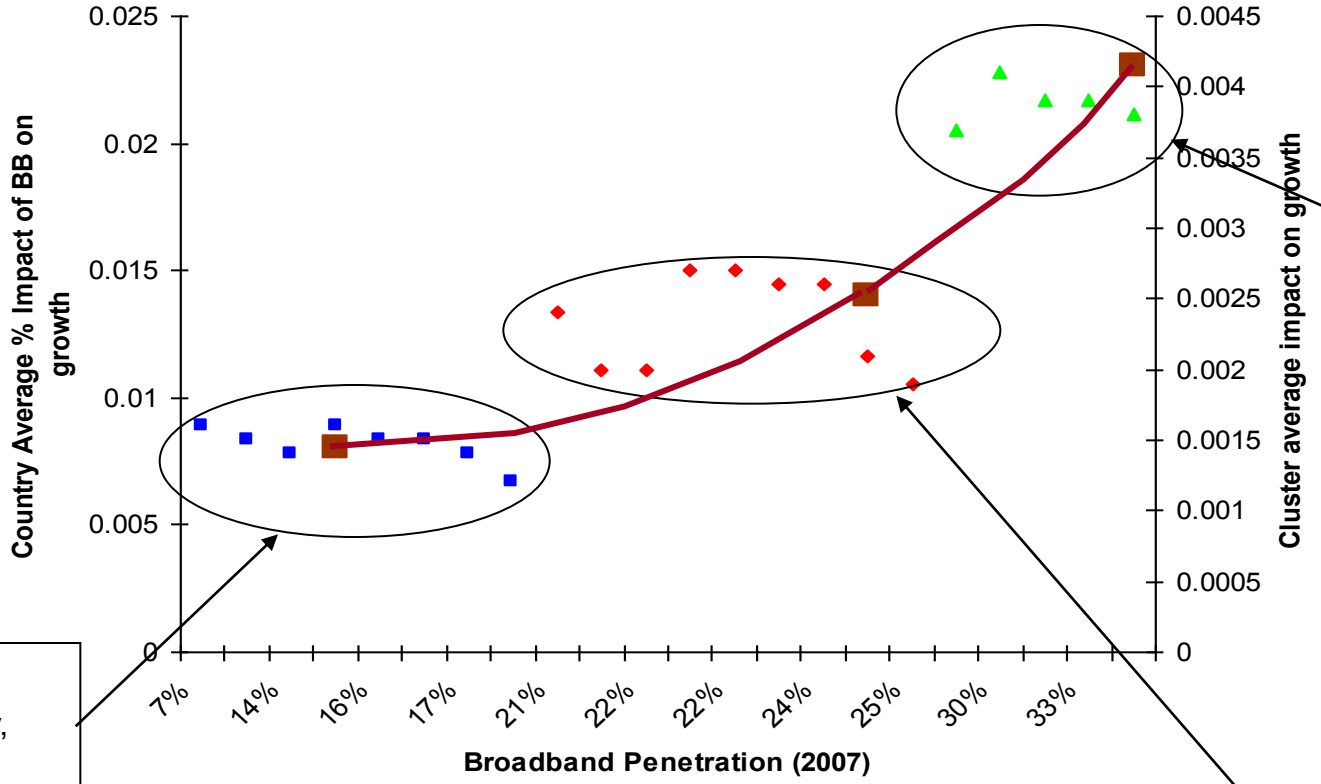


Research to date confirms the contribution to GDP growth but the amount of impact varies widely



However, these estimates are consistent with growing evidence of increasing returns to broadband penetration

INCREASING BROADBAND IMPACT ON GDP GROWTH



High penetration
- Denmark, Norway, Netherlands, Sweden, Switzerland
- Average contribution to GDP growth: 0.023

Low penetration
- Greece, Portugal, Italy, New Zealand, Austria, Hungary, Spain, Ireland
- Average contribution to GDP growth: 0.008

Medium penetration
- Germany, France, Japan, Belgium, UK, Australia, US, Canada, Luxemburg
- Average contribution to GDP growth: 0.014

Source: adapted from Koutroumpis (2009)

Broadband impact on job creation comprises two effects

DEPLOYMENT OF BROADBAND

IMPACT OF BROADBAND CONSTRUCTION

DIRECT JOBS
Employment generated in the short term in the course of deployment of network facilities

- **Telecommunications technicians**
- **Construction workers**
- **Civil and RF engineers**

INDIRECT JOBS
Employment generated by indirect spending (or businesses buying and selling to each other in support of direct spending)

- **Metal products workers**
- **Electrical equipment workers**
- **Professional Services**

INDUCED JOBS
Employment generated by household spending based on the income earned from the direct and indirect effects

- **Consumer durables**
- **Retail trade**
- **Consumer services**

IMPACT OF BROADBAND EXTERNALITIES

PRODUCTIVITY
Employment generated in the short term in the course of deployment of network facilities

- **Marketing of excess inventories**
- **Optimization of supply chains**

INNOVATION
Employment generated by indirect spending (or businesses buying and selling to each other in support of direct spending)

- **New applications and services**
- **New forms of commerce and financial intermediation**

VALUE CHAIN RECOMPOSITION
Employment generated by household spending based on the income earned from the direct and indirect effects

- **Outsourcing of services**
- **Virtual call centers**
- **Core economic development clusters**

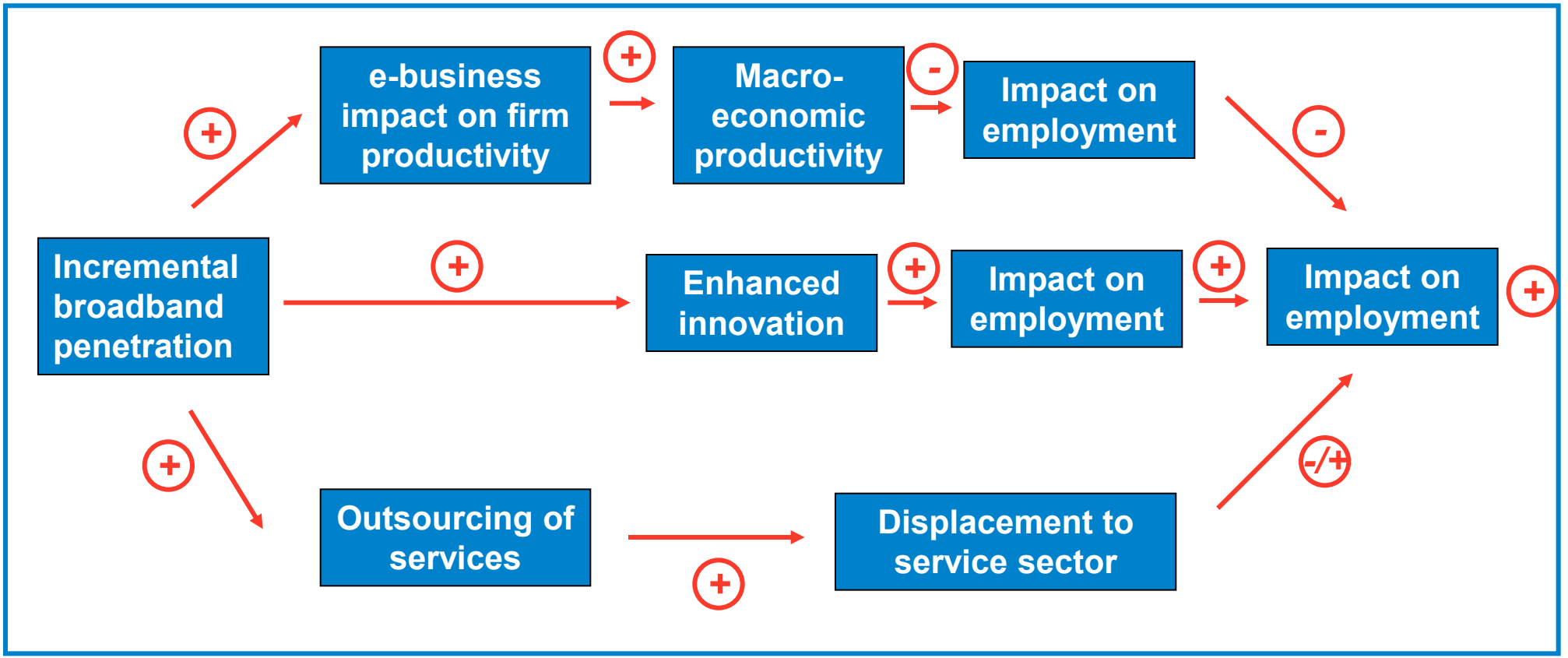
Estimates from several countries indicate that broadband network construction effects and multipliers are significant

NETWORK CONSTRUCTION EFFECTS OF BROADBAND

COUNTRY	RESEARCHER / INSTITUTION	STIMULUS INVEST. (US$ million)	NETWORK DEPLOYMENT JOBS ESTIMATE				MULTIPLIERS	
			DIRECT	INDIRECT	INDUCED	TOTAL	TYPE I (*)	TYPE II (**)
UNITED STATES	Katz (Columbia)	$ 6,390	37,300	31,000	59,500	127,800	1.83	3.42
	Atkinson (ITIF)	$ 10,000	63,660	165,815		229,475	2.58	3.60
SWITZERLAND	Katz (Columbia)	~$ 10,000	~80,000	~30,000	N.A.	~110,000	1.38	N.A.
GERMANY	Katz (Columbia)	$ 47,660	281,000	126,000	135,000	542,000	1.45	1.94
UNITED KINGDOM	Liebenau (LSE)	$ 7,463	76,500	134,500		211,000		2.76
AUSTRALIA	Government	$ 31,340				~200,000		

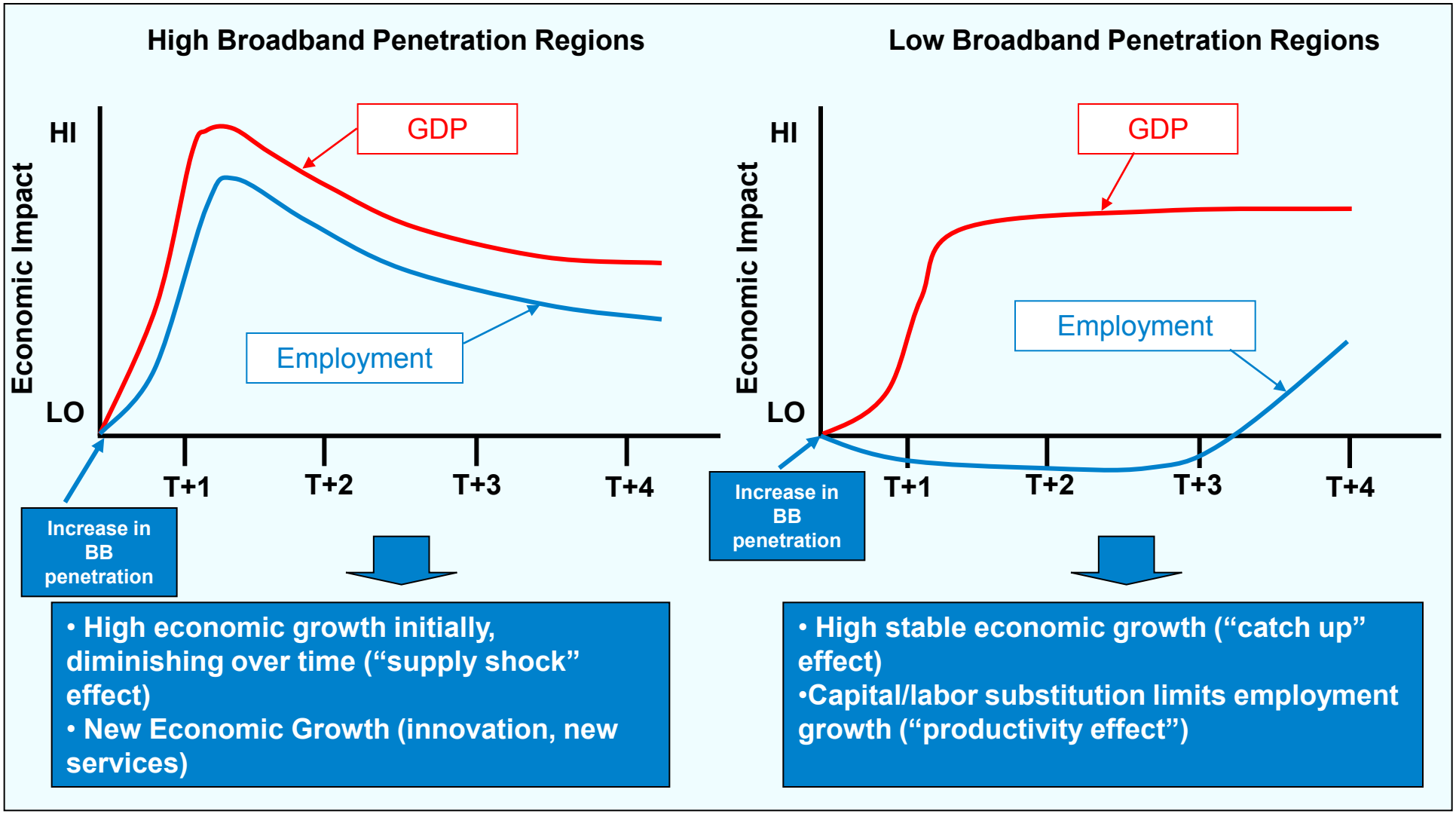
(*) (Direct + indirect)/direct
(**) (Direct + indirect + induced)/direct

The contribution of broadband externalities to employment comprises three simultaneous effects



Note: This causality chain was adapted from a model originally developed by Fornefeld et al., 2008 in a report for the European Commission

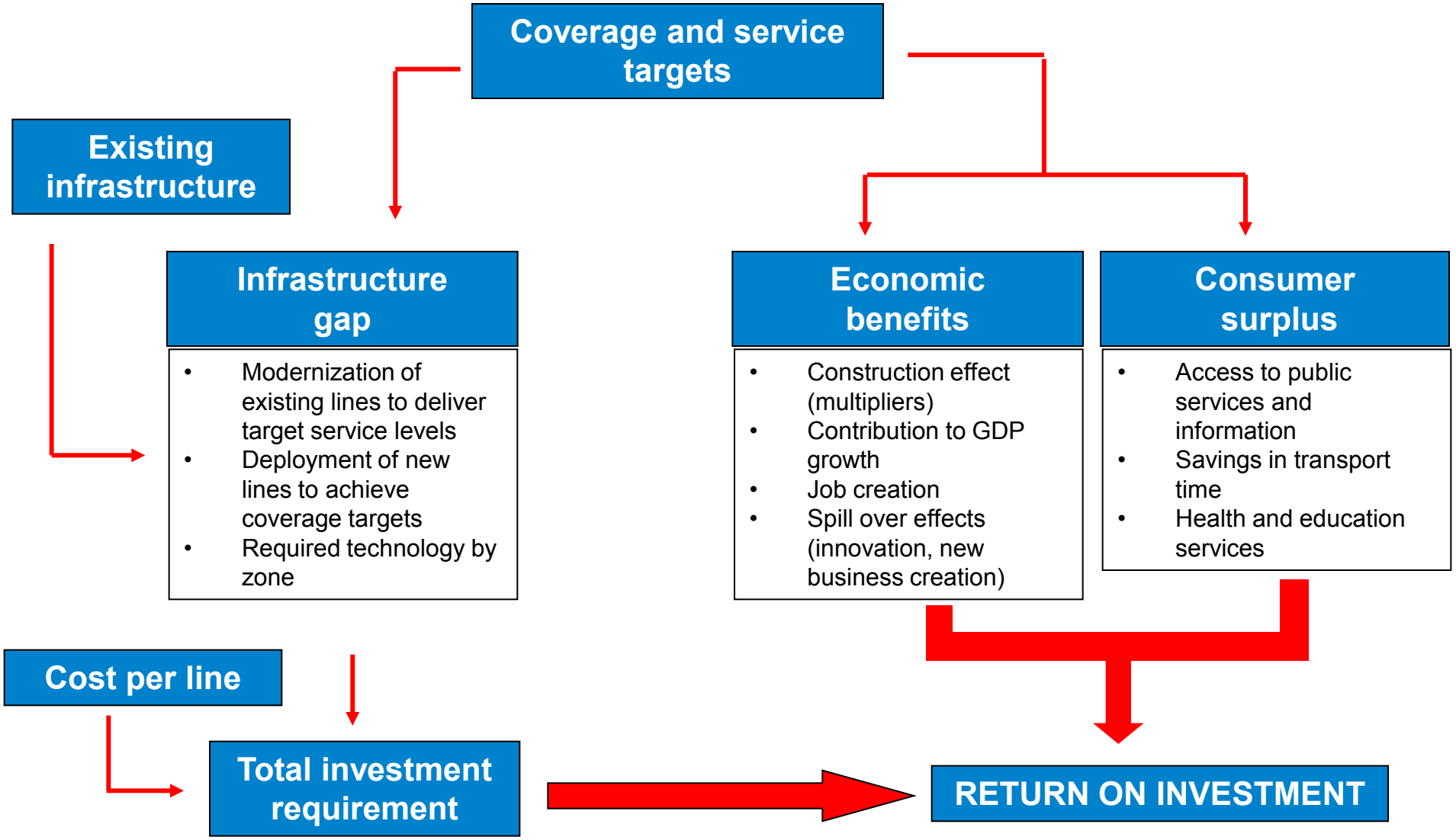
These effects result in different output and employment impact depending on broadband penetration



The importance of economic effects of broadband points to the criticality of a policy tool kit aimed at maximizing adoption

- National broadband plans outline coverage and service targets, assign spectrum to maximize the impact of wireless broadband, focus on demand stimulation, define competition policy, and tackle any potential supply obstacles
  - Articulate a vision and create awareness within polity and civil society
  - Coordinate policies and involvement from public and private sector
  - Develop state policies
  - Build ownership and accountability at the highest level of government
- Competition policies aimed at stimulating private sector investment and innovation are critical
- At the same time, governments should acknowledge that they will need to intervene
  - Address any market failures through universal service funds
  - Alleviate investment constraints to stimulate private sector flows
  - Potential entry as an investor of last resort

Coverage and service targets need to be defined on the basis of rigorous analysis of level of investment and social and economic returns



A broadband policy should also address the demand gap: why are there households that could buy broadband but do not?

BROADBAND DEMAND GAP

Country	Households passed (*)	Households connected	Demand Gap
Australia	89 %	69 %	20 %
Denmark	96 %	76 %	20 %
France	100 %	77 %	23 %
Germany	98 %	58 %	40 %
Israel	100 %	83 %	17 %
Italy	95 %	55 %	40 %
Republic of Korea	100 %	93 %	7 %
Spain	93 %	61 %	32 %
Sweden	100 %	89 %	11 %
United Kingdom	100 %	68 %	32 %
United States	92 %	62 %	31 %

(*) Note: Household passed is defined as a residence where the broadband network is deployed; this differs from connected, which means the residence is linked to the network for provisioning the service.

Sources: Analysis by the author, based on data from EU; FCC; BMWi; OECD; PTS - Sweden; and Israel Minister of Communication.

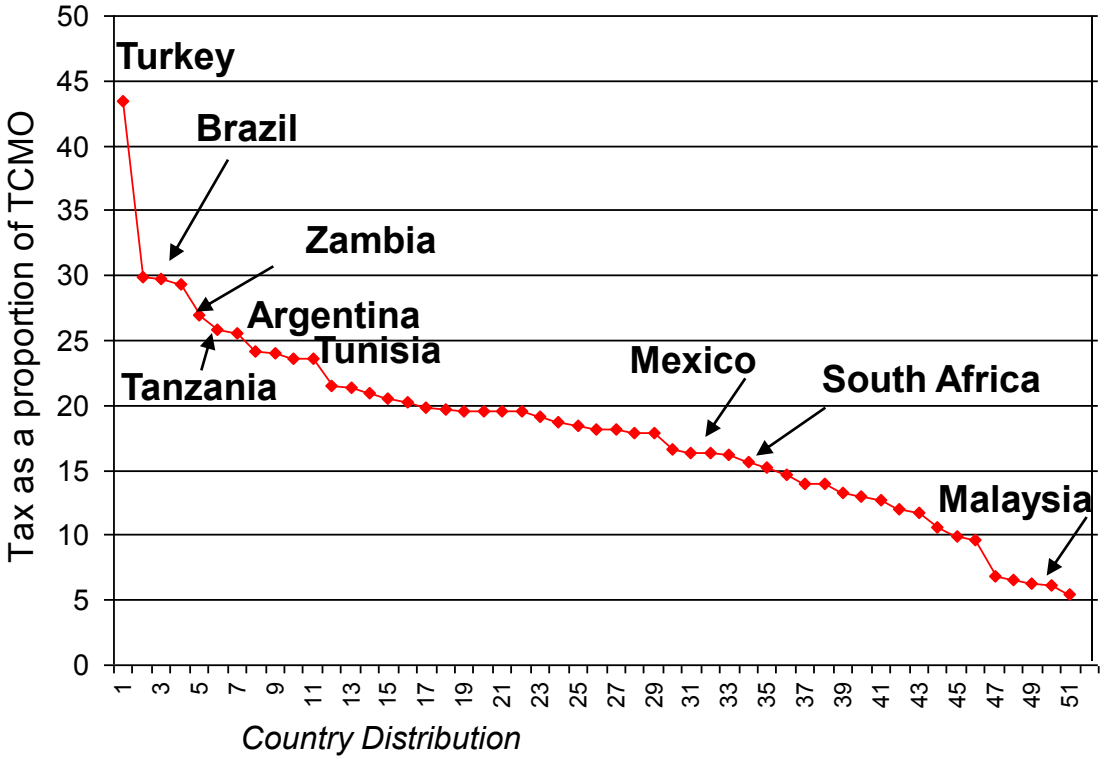
REASONS FOR NOT ACCESSING TO THE INTERNET AT ALL

Reasons	Percentage of answers	
	United States	United Kingdom
Relevant (lack of interest, busy doing other tasks, other reasons)	45 %	60 %
Price (the cost of broadband is too high, does not have a computer)	15 %	28 %
Service availability	16 %	14 %
Easy to use (difficulty – senior citizen – physical handicap)	22 %	16 %

Sources: Horrigan, J. (2009); Ofcom (2008)

Finally, it is imperative that fiscal policies affecting broadband adoption be coordinated with national objectives

TAX PERCENTAGE OF TOTAL COST OF OWNERSHIP OF MOBILE SERVICES



- Taxation has a negative impact on deployment of mobile broadband: there is a negative relation between mobile taxes and 3G handset penetration
- If taxes limit adoption of wireless broadband, they ultimately affect economic growth

Source: Adapted from Katz et al. (2010c)

In summary…

- Research evidence is consistently pointing to the positive economic of broadband
- Data analysis also indicates that economic impact increases with broadband penetration
- Economic impact varies by region indicating that broadband deployment needs to be carefully coordinated with economic development policies (training, firm relocation, etc.) to maximize impact
- Broadband policies are critical to maximize the economic impact of technology (national broadband plans, competition policies, demand stimulation, alignment of taxation with development and technology objectives)
- Policy development needs to be based on rigorous economic analysis which requires an important effort in data generation