

The impact of the National Broadband Plan on jobs: a quantification framework

Dr. Raúl L. Katz, Adjunct Professor, Division of Finance and Economics, and Director, Business Strategy Research, Columbia Institute of Tele-information

*The National Broadband Plan: a roundtable discussion
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The US National Broadband Plan aims to reach universal service and ensure that 88% of households have access to at least 100 Mbps by 2020

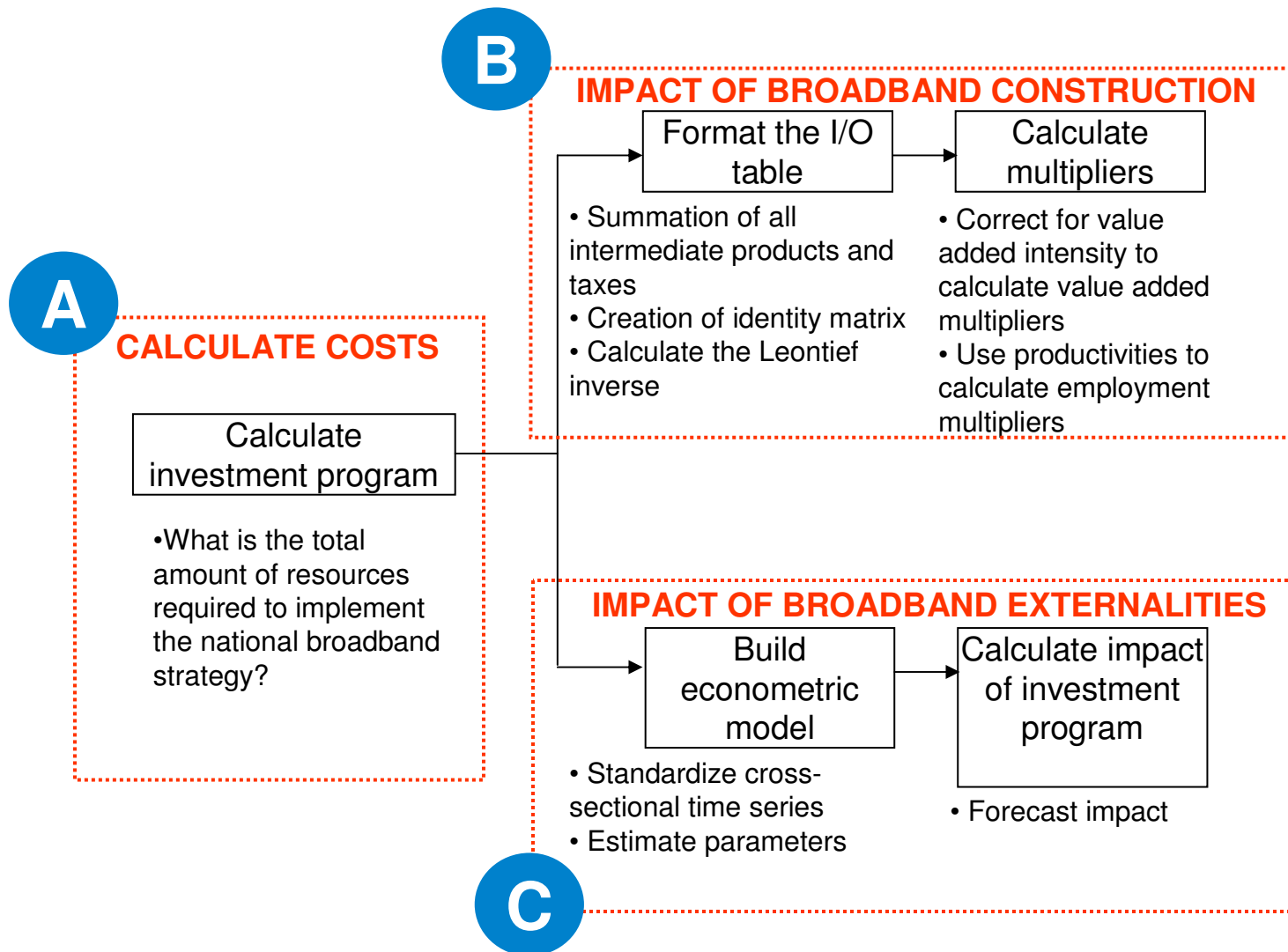
National Broadband Plan Goals (2010-2020)

- At least 100 million households should have affordable service of download access speeds at 100 Mbps and upload of 50 Mbps
- Every American should have access to robust broadband service
- Every American community should have institutional access to 1 Gbps

Implications

- Deploy broadband in unserved areas: 9 million households
- Upgrade service to “gray” areas: unclear
- Upgrade service (e.g. speed) to served areas: 100 million households (88% of 114 million households) of which 50 million are already passed to deliver speeds >18 Mbps between telcos and cable (source: Citi)

Employment impact of these targets comprise both the effect of network construction and externalities



A

The broadband plan will require a significant investment by 2020

Covering "white spots"	<ul style="list-style-type: none"> • Approximately 92% currently served 	<ul style="list-style-type: none"> • Cover unserved households (9,000,000) with a mix of wireless and wireline broadband technologies (\$ 1,200 - \$ 1,300 per line)
Upgrade "grey spots"	<ul style="list-style-type: none"> • Unclear as to % of currently served with speeds < 3 Mbps 	<ul style="list-style-type: none"> • Upgrade "Grey spot" households to 3 Mbps
Upgrade served areas	<ul style="list-style-type: none"> • Verizon: 18 million 50 Mbps • ATT: 22 million 18 Mbps • Qwest: 3 million 40 Mbps • Comcast: 50 million DOCSIS 3.0 	<ul style="list-style-type: none"> • Upgrade Verizon's to 100 Mbps • Upgrade ATT's to 100 Mbps (\$ 800 per line) • Upgrade others to 100 Mbps (\$ 1,200 - \$ 1,500 per line) • Upgrade cable to full DOCSIS 3.0 capability

Source: Atkinson, R. And Scultz, I. *Broadband in America* (2009).

A

For example, the German broadband strategy will require an investment of 20.2 billion Euros by 2014, and 15.7 billion incremental Euros by 2020

Covering "white spots"	2014	924 Million EUR	<ul style="list-style-type: none"> • Cover unserved households (730,000) with a mix of wireless (480,000 lines) and wireline broadband technologies (250,000 lines)
Upgrade "grey spots"	2014	336 Million EUR	<ul style="list-style-type: none"> • Upgrade "Grey spot" households (2,800,000) to 1 Mbps
VDSL	2014	6,747 Million EUR	<ul style="list-style-type: none"> • Provide 19,861,000 households (or 50%) with VDSL service by 2014 • Provide 11,916,600 households (or 30%) with VDSL service by 2020
Ftth	2014	12,236 Million. EUR	<ul style="list-style-type: none"> • Provide 9,930,500 households (or 25%) with Ftth service by 2014 • Provide 19,861,000 households (or 50%) with Ftth service by 2020
	2020	15,690 Million EUR	
Σ Total	2014	20,243 Million EUR	<ul style="list-style-type: none"> • By 2014, universal broadband supply with 75% of households receiving over 50 Mbps • By 2020, universal broadband supply with 80% of households receiving over 50 Mbps, and 50% over 100 Mbps
	2020	15,690 Million EUR	

Source: Own calculations based on ADL (2009), JP Morgan(2006), WIK (2008), AT Kearney (2008), EU-US experiences, Analysis Mason (2008)

B

Three types of network construction effects exist

Direct jobs and output

• Employment and economic production generated in the short term in the course of deployment of network facilities

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

Indirect jobs and output

• Employment and production 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 and output

• Employment and production generated by household spending based on the income earned from the direct and indirect effects

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

Estimates for other countries indicate that network construction effects and multipliers are significant

NETWORK CONSTRUCTION EFFECTS OF BROADBAND

COUNTRY	STIMULUS INVESTMENT (USD billion)	NETWORK DEPLOYMENT JOBS ESTIMATE				MULTIPLIERS	
		DIRECT	INDIRECT	INDUCED	TOTAL	TYPE I (*)	TYPE II (**)
SWITZERLAND	~\$ 10,000	~80,000	~30,000	N.A.	~110,000	1.38	N.A.
GERMANY	\$ 47,660	281,000	126,000	135,000	542,000	1.45	1.94
UNITED KINGDOM	\$ 7,463	76,500	134,500		211,000		2.76
AUSTRALIA	\$ 31,340				~200,000		

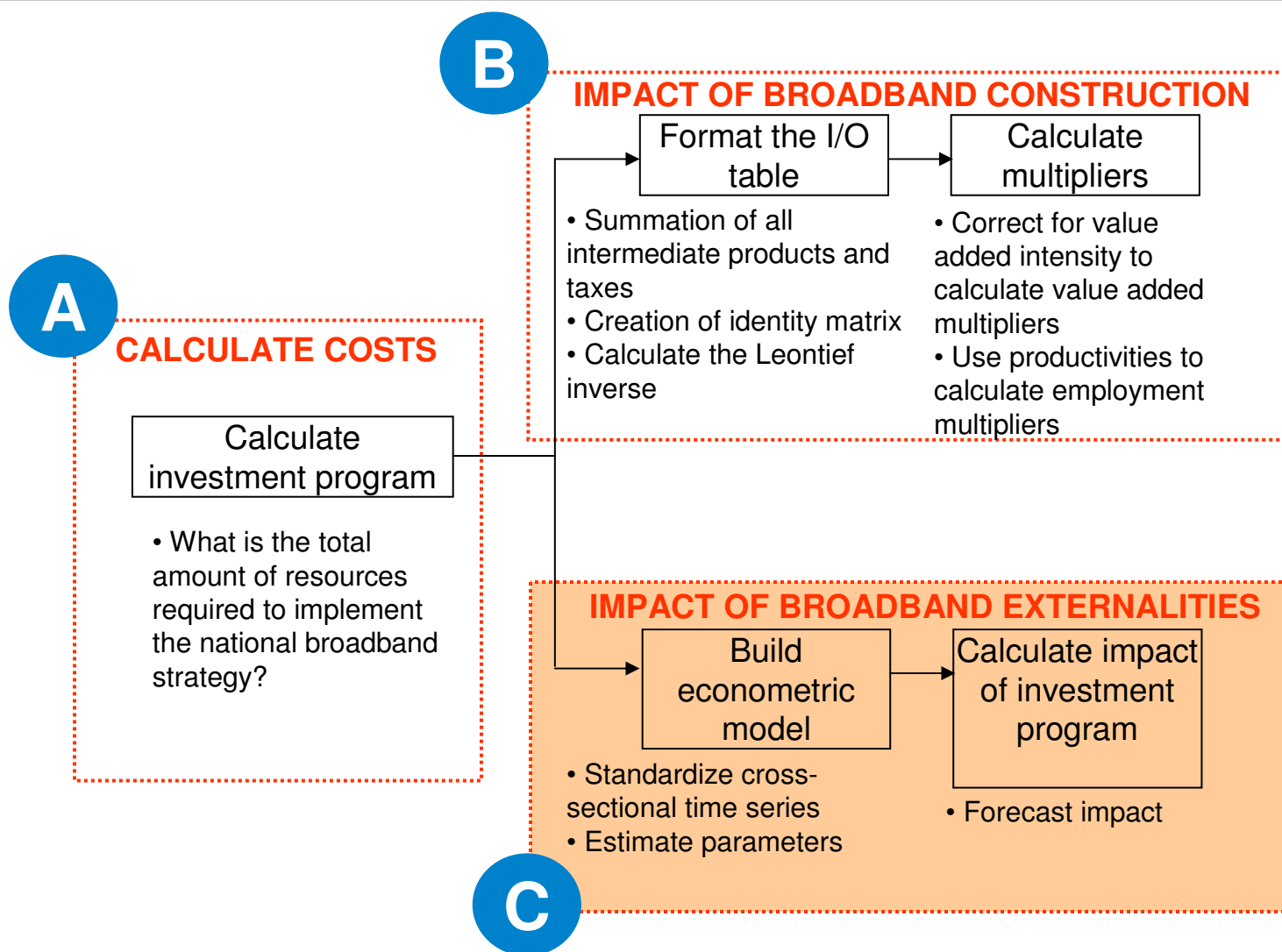
Sources: Katz, R. and Suter, S. (2009). *Estimating the economic impact of the US broadband stimulus plan*, Columbia Institute for Tele-Information working paper; Katz, R., P. Zenhäusern, S. Suter, P. Mahler and S. Vaterlaus (2008).

Economic Modeling of the Investment in FTTH in Switzerland, unpublished report; Libenau, J., Atkinson, R. (2009) *The UK's digital road to recovery. LSE and ITIF*; Australian government. Katz, R., S. Vaterlaus, P. Zenhäusern, S. Suter and P. Mahler (2009). *The Impact of Broadband on Jobs and the German Economy*; Columbia Institute for tele-Information working paper

(*) (Direct + indirect)/direct

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

Once the broadband network is deployed, additional job creation and economic impact will result from externalities



C

Broadband infrastructure yields three network effects

Productivity

- Improvement of productivity as a result of the adoption of more efficient business processes enabled by broadband

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

Innovation

- Acceleration of innovation resulting from the introduction of new broadband-enabled applications and services

- **New applications and services (telemedicine, Internet search, e-commerce, online education, VOD and social networking)**
- **New forms of commerce and financial intermediation**

Value chain recomposition

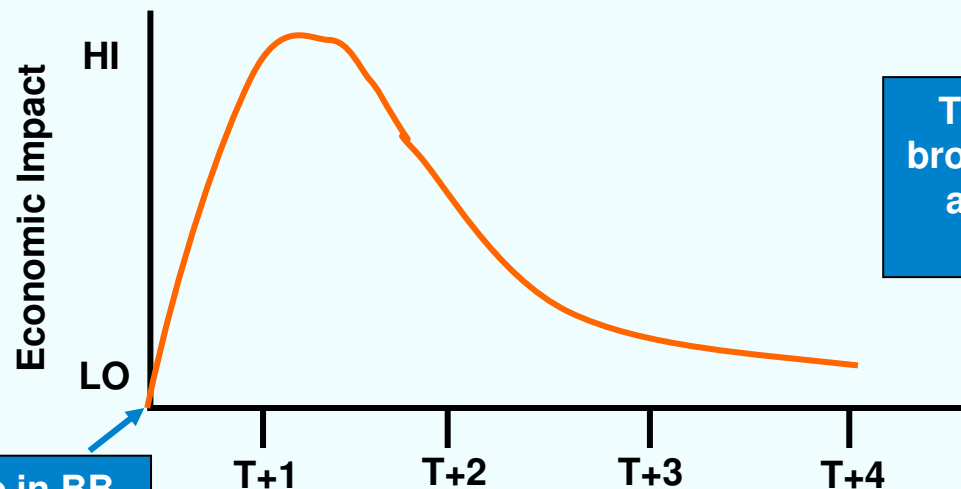
- Attract employment from other regions as a result of the ability to process information and provide services remotely

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

C

Economic impact of broadband in terms of network externalities have been found to be significant

- Our analysis estimated the impact of increase in broadband penetration on rate of economic growth and job creation
- Aggregate results for the whole territory indicate that broadband penetration has a significant short-term effect on economic growth

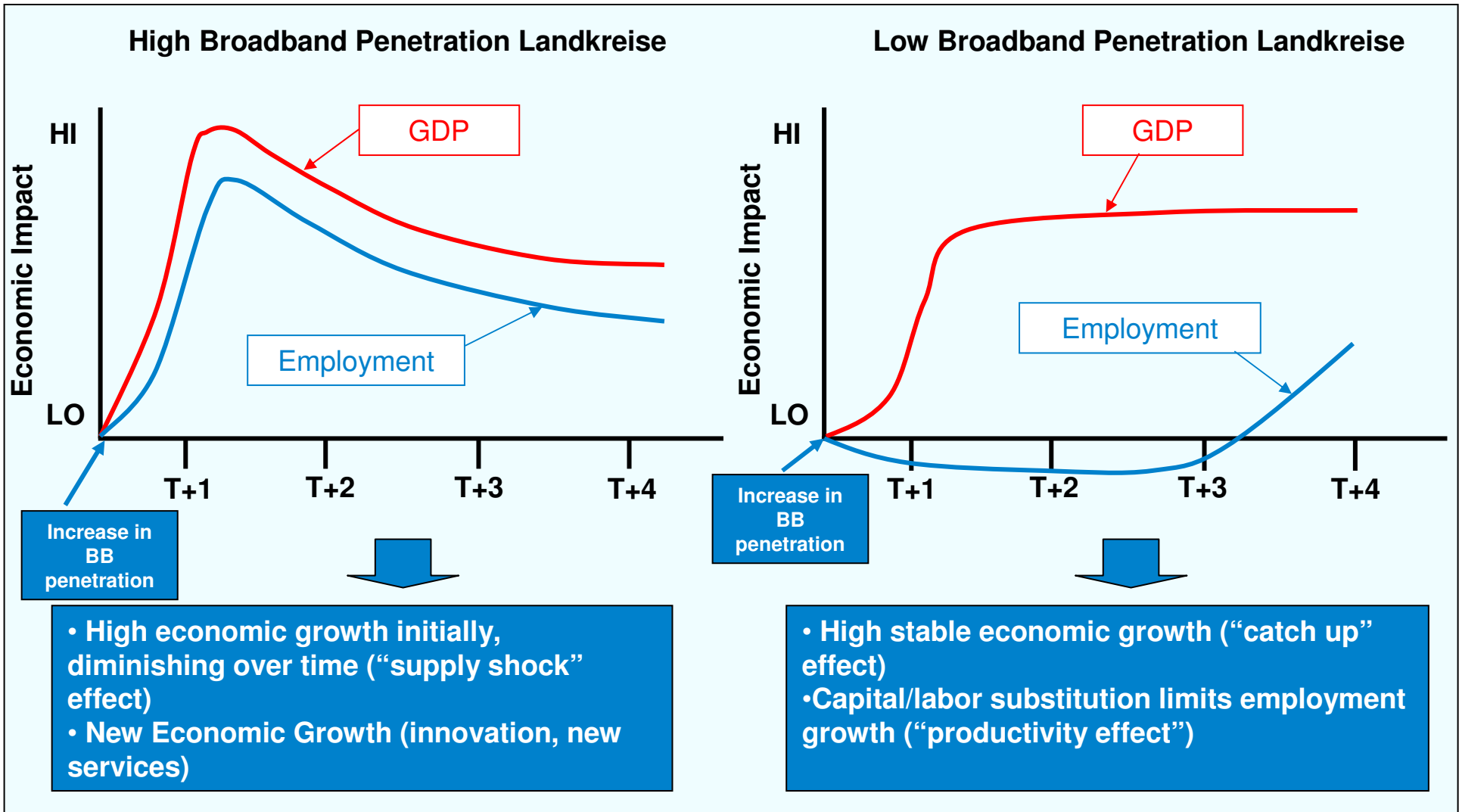


Increase in BB penetration

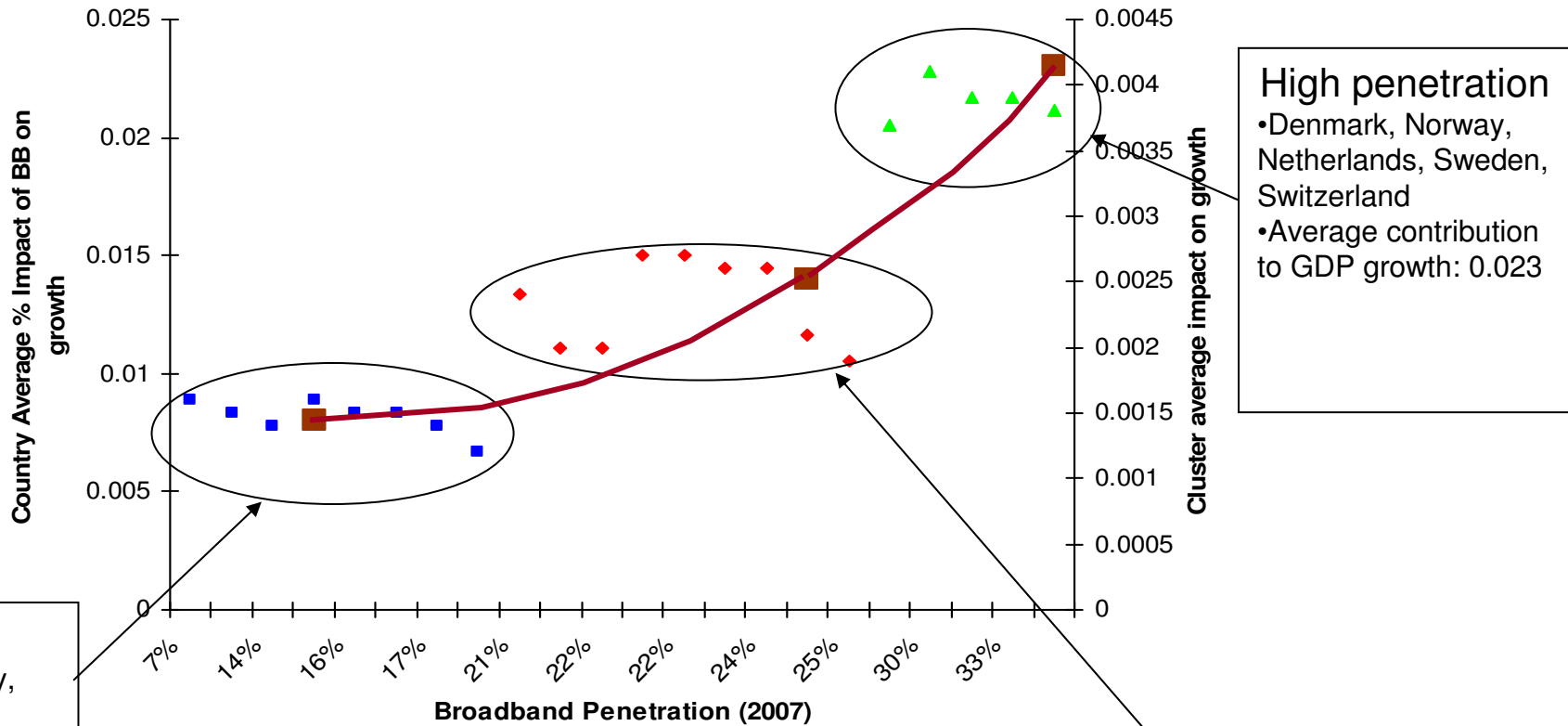
The economic stimulus impact of broadband is highest in the first year after increase in penetration and tends to diminish over time

C

Different economic impact profiles result from distinct levels of broadband penetration within regions



These estimates are consistent with growing evidence of the “critical mass” theory of broadband economic impact



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

Source: adapted from Koutrompis (2009)

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

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

Why Should Governments invest in broadband infrastructure in the current environment?

- Generate jobs and output as a result of the construction of networks
 - Estimates for network construction jobs are fairly robust and consistent with prior research
 - Employment multipliers: between 1.92 and 3.42
- Promote innovation, and creation of new businesses once the networks are deployed
 - Additional 0.60% in GDP growth
 - Accelerate development of core regions
 - Attract new industries, with employment potential

Policy and research implications

- Job fulfillment is driven by success in implementing job creation and retention programs that could be enabled by broadband
- Policy implications:
 - Coordinate broadband deployment with job creation and retention programs
 - Refine criteria for selecting areas to deploy broadband based on the stimulus
 - Develop systematic tests based on social and economic criteria to evaluate the return on the investment
- Research agenda:
 - Economic impact of 100 Mbps?
 - Is there a saturation effect limiting broadband impact?

