

*Making it Happen: How
the Juncker Commission
Can Deliver the
Digital Single Market?*

Productivity and Digitalisation in Europe: Paving the Road to Faster Growth

By Bart van Ark

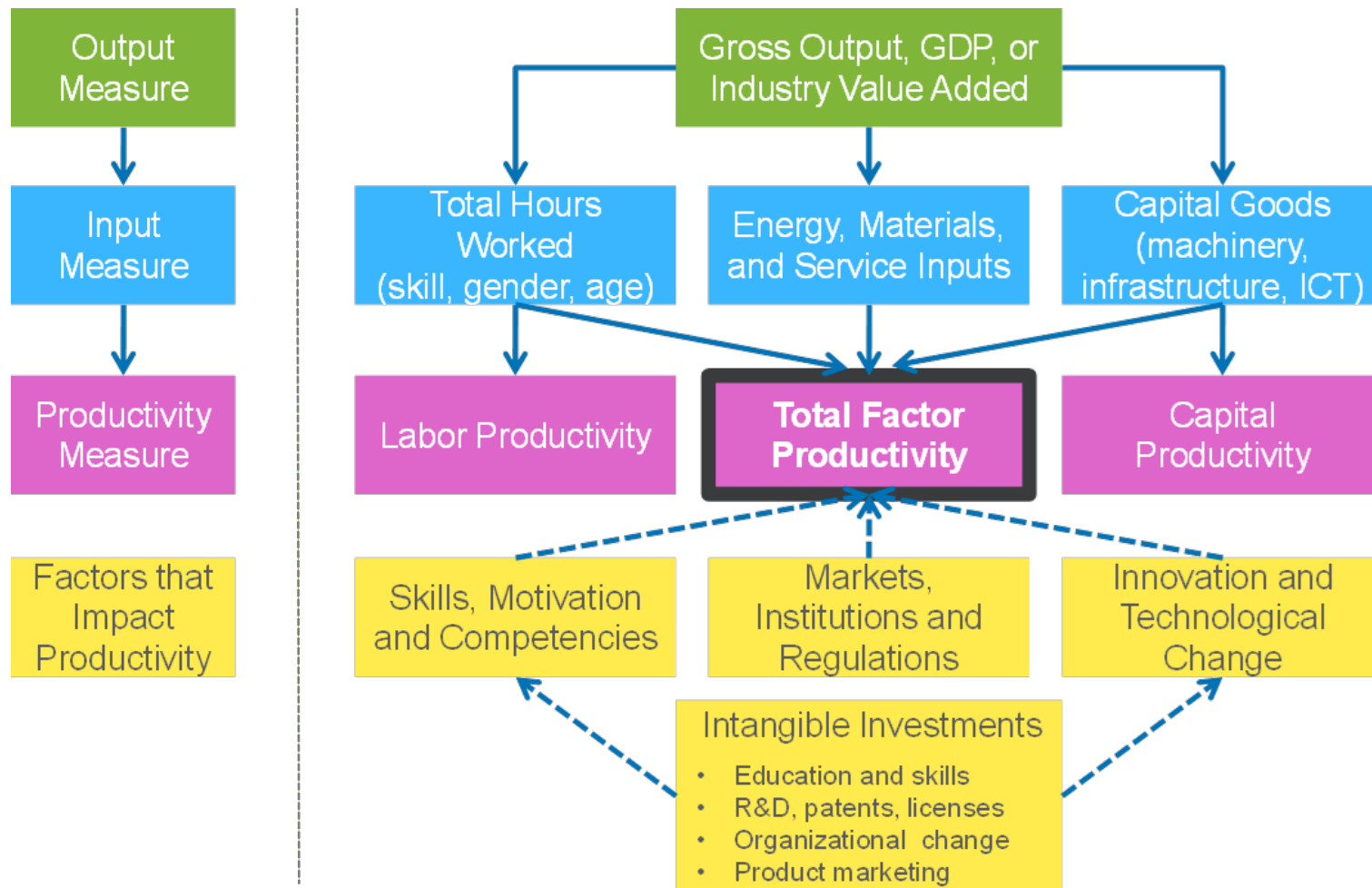
Policy brief builds on body of work by The Conference Board

- ***Recent Changes in Europe's Competitive Landscape and Medium-Term Perspectives: How the Sources of Demand and Supply Are Shaping Up***, The Conference Board Report for DG ECFIN, European Economy Economic Papers 485, Brussels: European Commission, 2013 (Bart van Ark, Vivian Chen, Bert Colijn, Kirsten Jäger, Wim Overmeer and Marcel Timmer).
- ***Unlocking the ICT growth potential in Europe: Enabling people and businesses. Using Scenarios to Build a New Narrative for the Role of ICT in Growth in Europe***, The Conference Board, Report for DG Connect, European Commission, Brussels, 2013 (Desirée van Welsum, Willem Overmeer, and Bart van Ark).
- ***Communication Networks, ICT and Productivity Growth in Europe***, The Conference Board, Report for Telefonica S.A., 2014 (Carol Corrado and Kirsten Jäger).



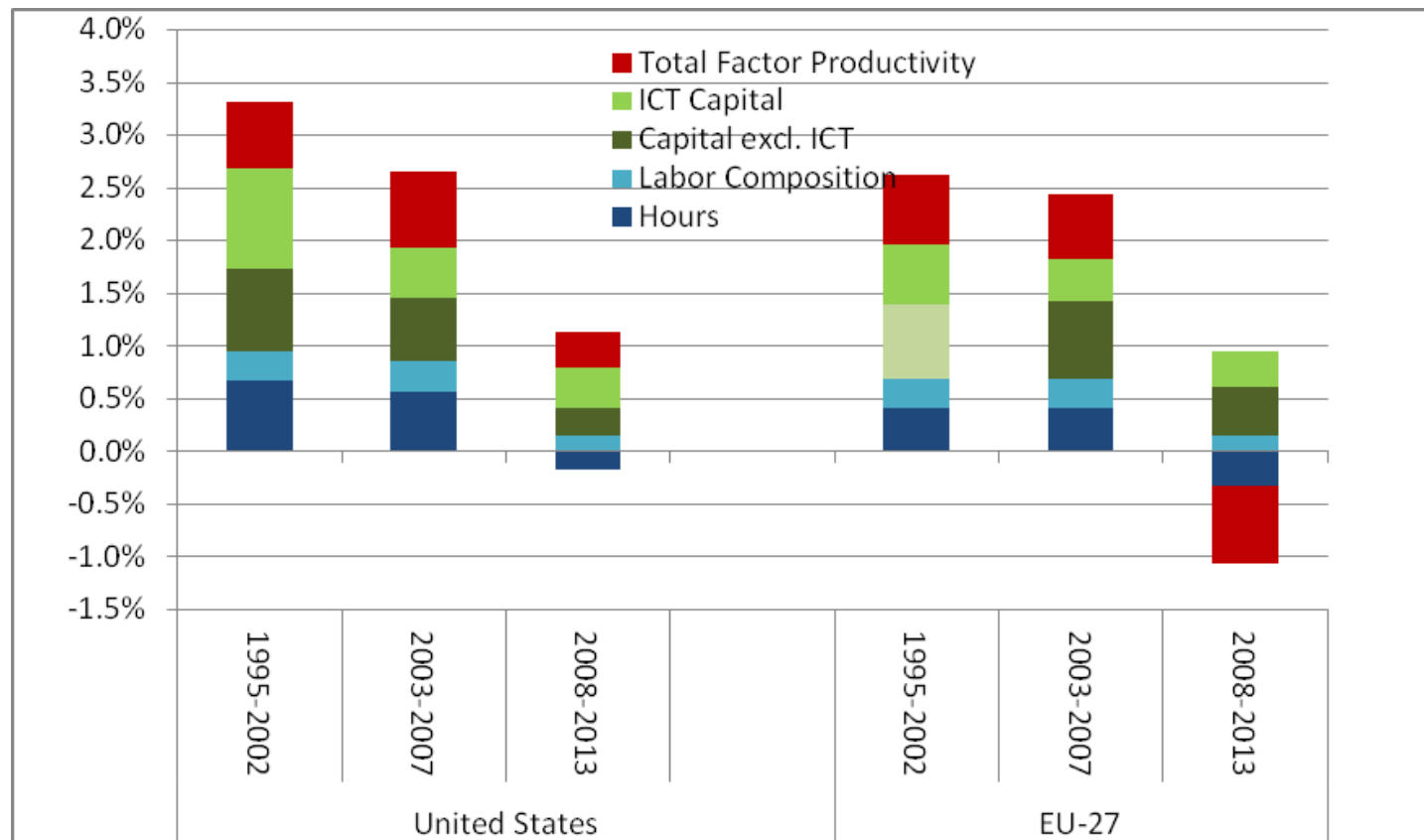
Bumps on the road

Diving deeper into the drivers of productivity growth



Significant slowdown in TFP growth cannot be sustained

Sources of GDP Growth, average annual contribution % change



Source: The Conference Board Total Economy Database & Global Economic Outlook 2014, Update February 2014 (<https://www.conference-board.org/data/globaloutlook.cfm>)

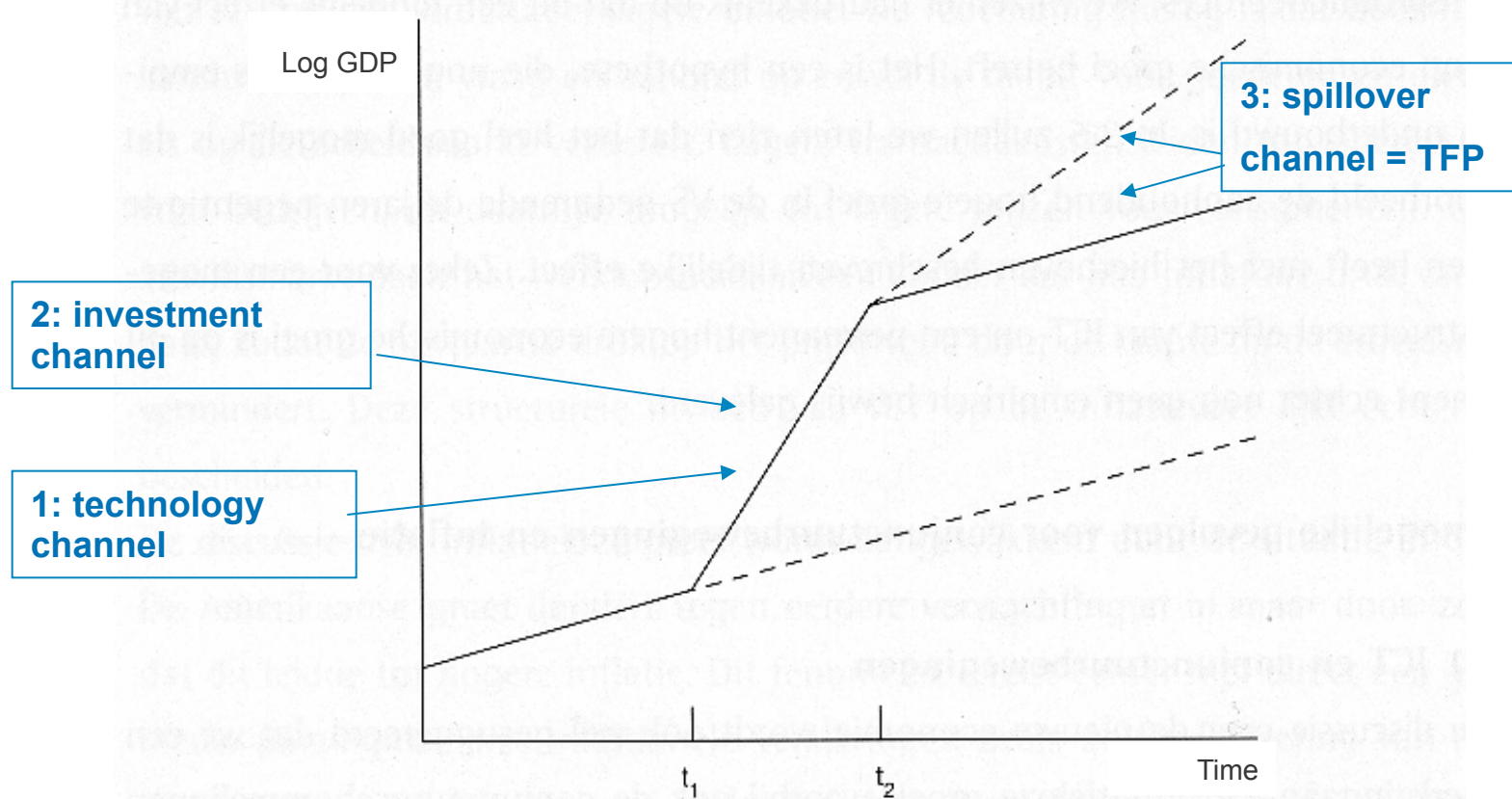


How can negative total factor productivity growth happen and can it last for long?

- Negative effects from recession should be short-lived once the economy recovers
- Increased rigidities in labor, product and capital markets lead to greater misallocation to less productive firms
- Negative reallocation effects with more resources going to less productive sectors in the economy (EU KLEMS)
- Caveat: TFP is a residual, so measurement error in output or inputs and unmeasured effects end up here
- ***Longer-term, TFP signals weaker technological progress and innovation – an ongoing trend since decades***



The impact of ICT on economic growth and productivity



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Recent deployment of Information and Communication Technology is difficult to capture in productivity statistics

| Process | Description | Where in SOG? |
|--------------------------|--|---|
| 1. Network buildout | High investment and capacity building | Capital stocks |
| 2. Network take-up | Utilization of installed capacity rises | Capital contribution (via capital income) |
| 3. Network externalities | a. Returns to scale (Metcalfe's Law) | MFP |
| | b. Innovative adaptations (Internet and wireless technologies as GPTs) | MFP |

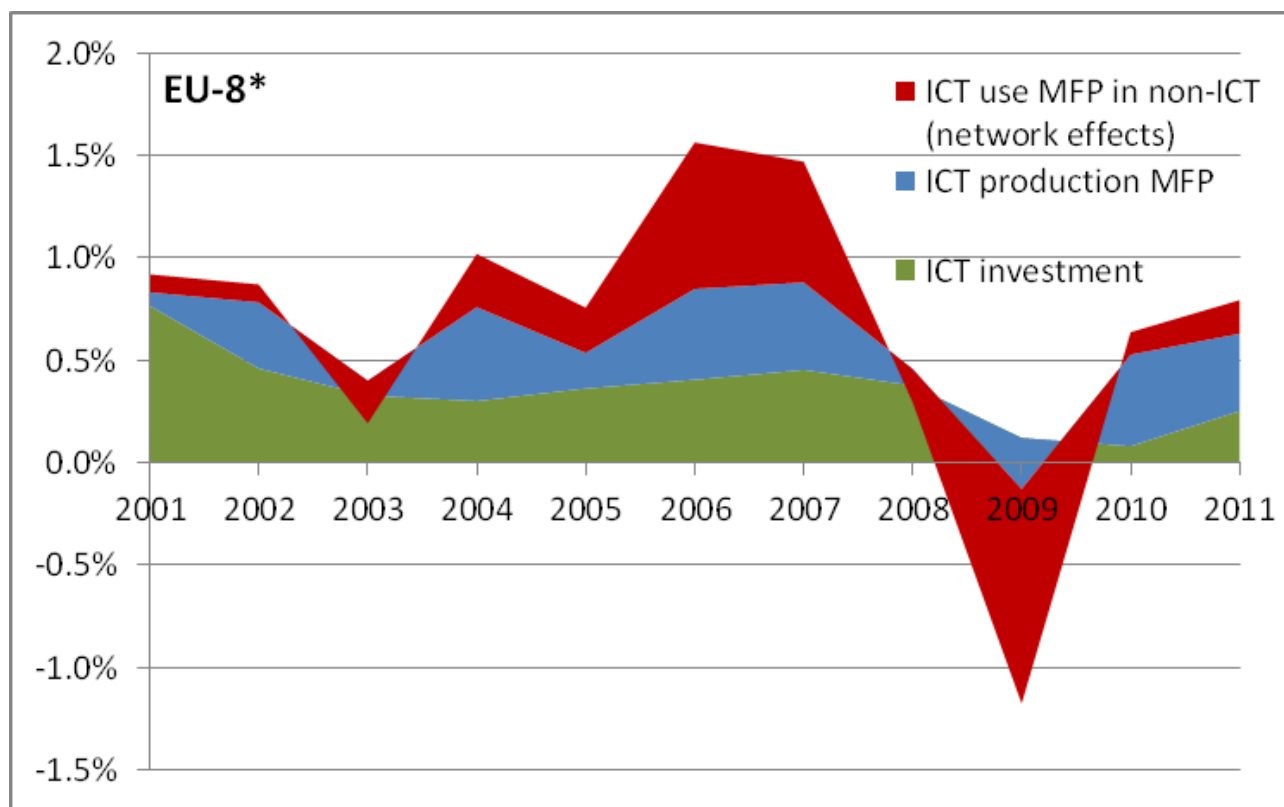
NOTES—SOG refers to sources-of-growth analysis.

SOURCE—Corrado (2011)



ICT was good for about 1 %-point of EU GDP growth before crisis; since then 10 times less as ICT use effects in non-ICT sector collapsed and slowly recover

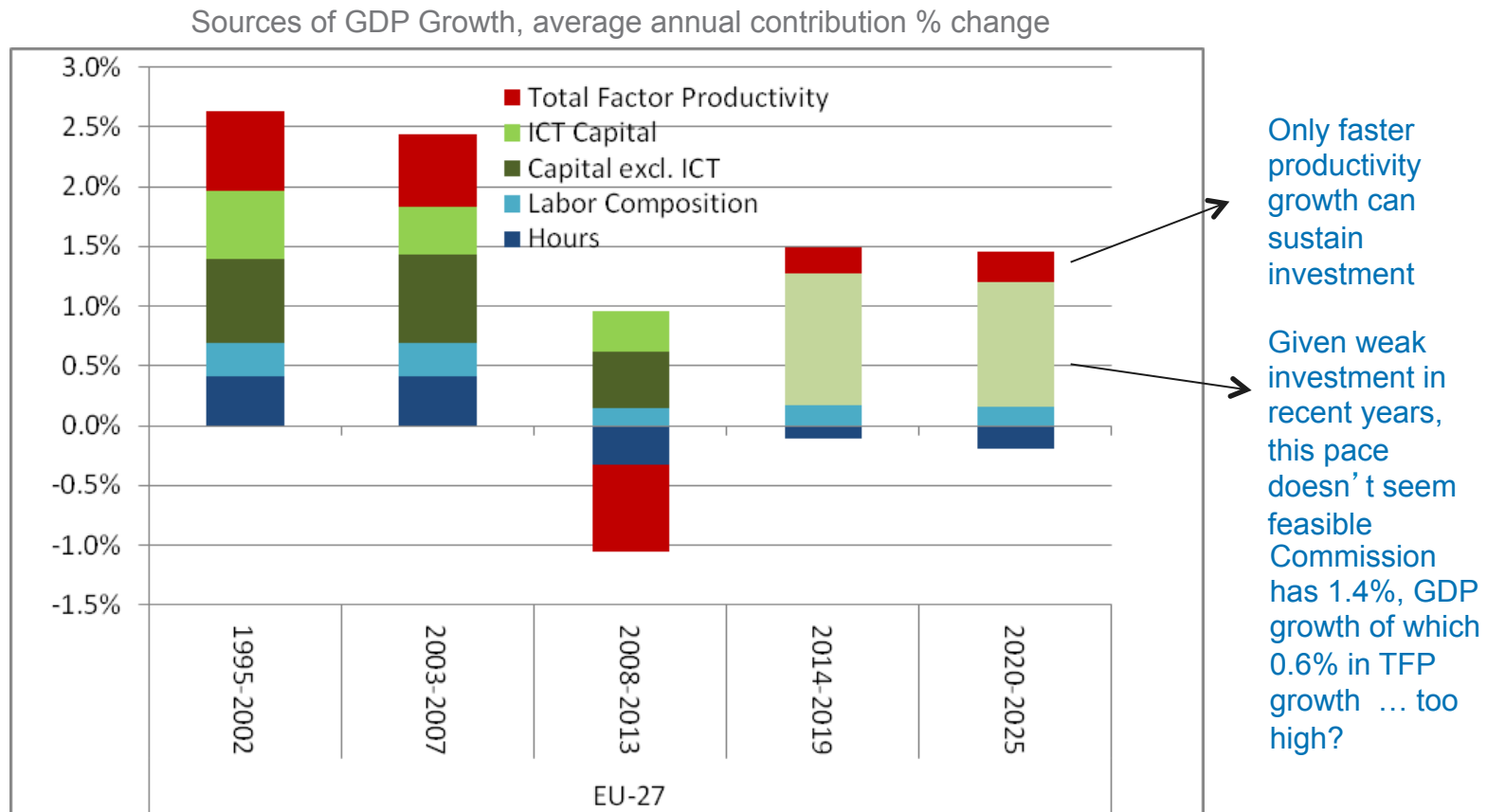
Growth Contributions from ICT Production, Investment and Use in Non-ICT sector, 2001-2011



* EU-8 includes Austria, Finland, France, Germany, Italy, Netherlands, Spain and the United Kingdom



Projections show an investment pace which cannot be sustained with such low productivity growth



Source: The Conference Board Total Economy Database & Global Economic Outlook 2014, Update February 2014 (<https://www.conference-board.org/data/globaloutlook.cfm>)



Paving the road: focus on intangibles

Productivity through digitalization is the key to returning to a sustainable growth path in Europe

- Improved economic conditions as represented by a rise in GDP can only be sustained through growth in labour productivity.
- The potential of digitalisation to accelerate growth will come primarily from the use of these technologies by industries in the non-ICT sector
- As more companies adopt technology and innovations spread across the economy, the impact on productivity at macro levels becomes more visible
- The rapid diffusion of high-speed networks and mobile devices has the potential to empower consumers and businesses to drive demand in new ways
- Countries with large internet economies are receiving more revenue growth and consumer surplus affiliated with broadband diffusion
- The combined downturns and subsequent economic stagnation may have potentially eroded some sources of long-term growth, such as skills, ICT investment, and intangibles, which need to be restored



The economic view of intangibles (“knowledge based capital”) drastically changes view of growth and productivity

- Traditional capital estimates are understated because many costs of innovation are not counted as investment
- In “economic” view of investment any use of resources today designed to increase the productive capacity of the firm in the future is investment. (Corrado, Hulten and Sichel, CHS, 2006, 2009)
- CHS and Corrado, Haskel and Jona-Lasinio (CHJ-L) use the intangibles framework and propose building an “innovation account” to illuminate innovation processes.
- Many intangibles, beyond R&D, are difficult to value, market and trade creating potential non-rivalrous characteristics and spillovers
- Implementation of this view drastically changes our view of how the rise of the knowledge economy impacts on growth and productivity
- So policy-makers and accountants get more serious about intangibles



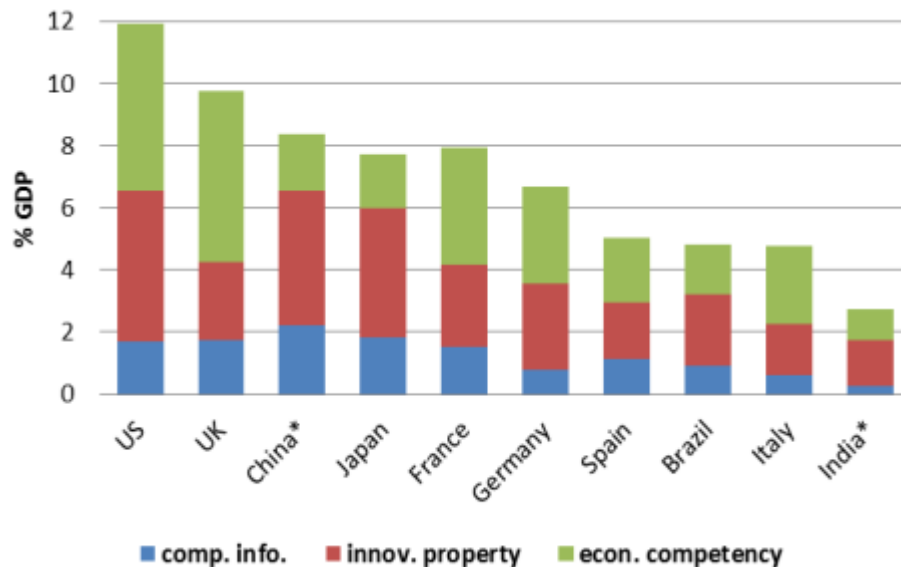
An extended framework for investment in intangibles is needed to understand impact of technology on growth

| Broad category | Type of Investment |
|--------------------------|---|
| Computerized Information | <ul style="list-style-type: none">• Software• Databases |
| Innovative Property | <ul style="list-style-type: none">• R&D• Mineral exploration• Entertainment and artistic originals• Design and other new product development costs |
| Economic Competencies | <ul style="list-style-type: none">• Branding (market research and long-lived advertising)• Firm-specific human capital (training)• Organizational capital (business process investment) |

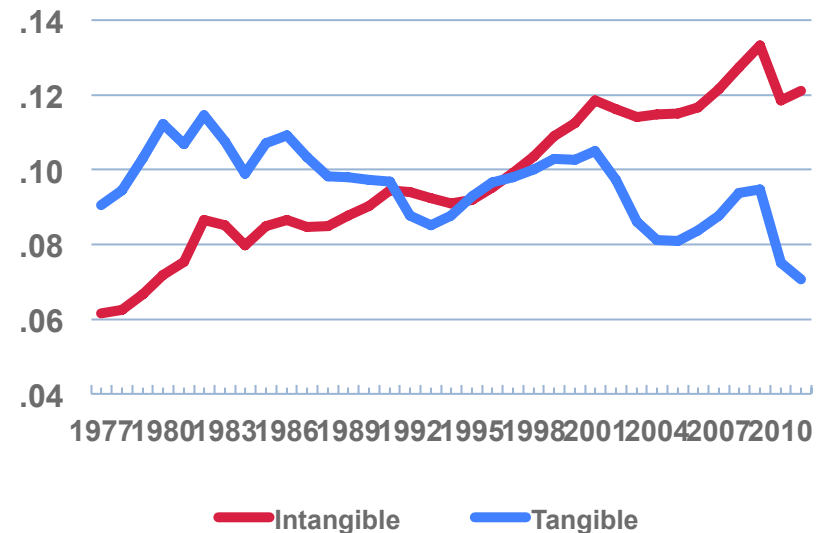


Intangible capital will gradually overtake tangible capital, fundamentally changing our perspective on growth

Investment in Market Sector GDP in 2008, as % of GDP



Investment in Private Industries in the United States, 1977-2011, as ratio to GDP

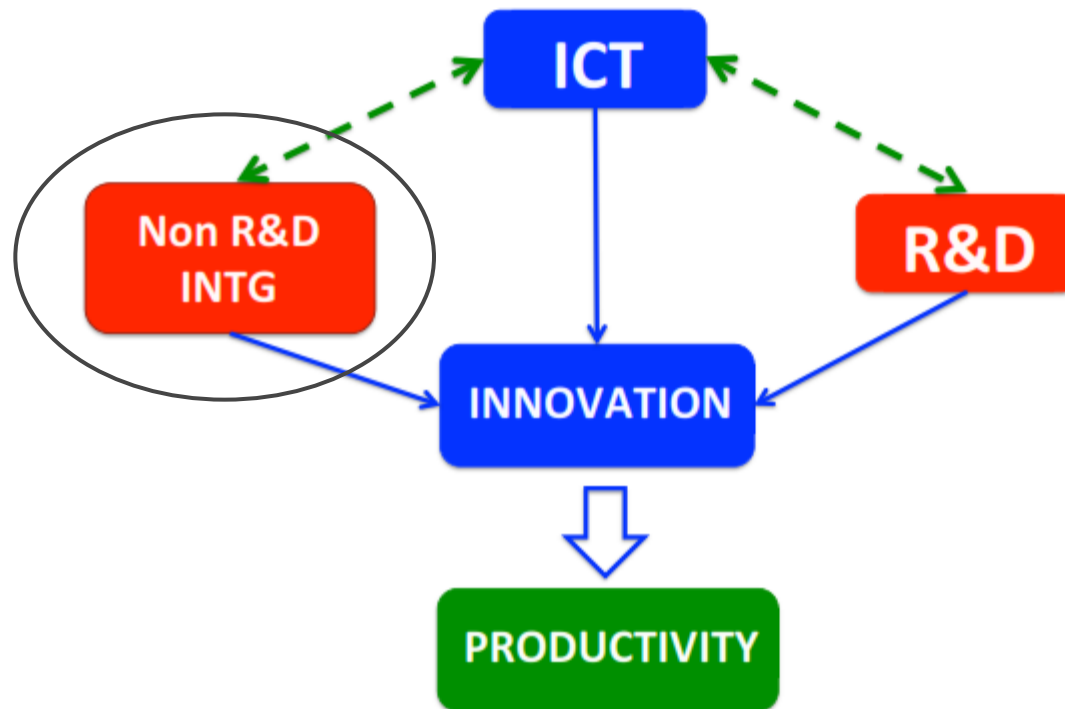


Excludes real estate/housing.

Note: Intangible investment in China and India are for the total economy, while investment in the rest of the countries are for the market sector. Sources: Corrado et. al. (2012), except for China from Hulten and Hao (2012), India from Hulten, Hao and Jaeger (2012), Brazil from Dutz et. al. (2012), and Japan from RIETI.



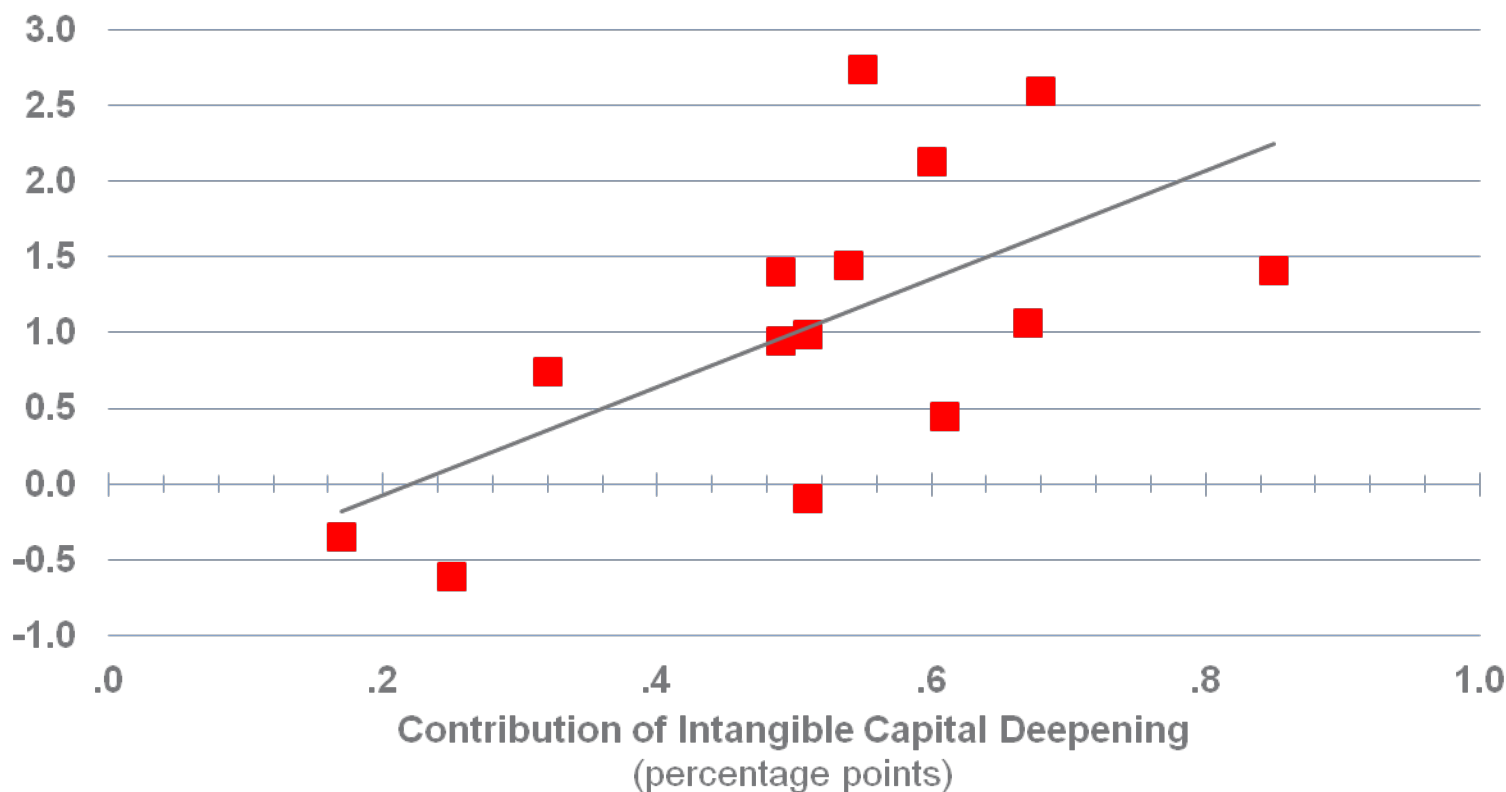
Why is it important to take a broader perspective on intangibles?



The non-rival nature of intangibles implies a theoretical link to productivity growth via diffusion

TFP growth in 14 EU countries, 1995-2007

Percent change



Policy scenarios related to Single Digital Market

Use scenario approach to lay out the impacts of ICT on future growth

- Guiding questions:

What future digital environments could occur, how do consumers and businesses fare, what happens to choice of products and services, and how are prices affected?

- On basis of expert interviews and desk research identify different constellations of drivers, barriers and uncertainties
- Two major uncertainties:
 - ✓ The pace of global growth
 - ✓ The degree of integration in the Single Market for Services and the Digital Single Market in practice
- Time frame: next 5 years or so

Source: Unlocking the ICT growth potential in Europe: Enabling people and businesses. Using Scenarios to Build a New Narrative for the Role of ICT in Growth in Europe, The Conference Board, Report for DG Connect, European Commission, Brussels, 2013 (Desirée van Welsum, Willem Overmeer, and Bart van Ark)



Drivers of the changing digital landscape and of technology impacts

- Widespread availability of **infrastructure**:
 - ✓ “hard infrastructure”: affordable, ubiquitous, always-on fixed and mobile Internet, mobile broadband, powerful devices, software, services, apps
 - ✓ “soft infrastructure”: high share of (mobile) Internet users, penetration of tablets and smart phones, digital skills, willingness to use
- Convergence of devices (phone, smart phone, tablet, “phablet”, computer, camera, gps)
- **Increased functionality and capacity** of devices and networks, combined with mobility
- Internet of Things, Internet of Everything – communicate with devices and appliances, including while ‘on the go’, and M2M
- Increasing availability of **mobile online content, apps and services**
- All combined trends generate ‘**big data**’.



Barriers and uncertainties to the impact of ICT on growth

- How will **legal and regulatory frameworks** deal with concerns around data, privacy, security, and trust? How will that limit what can be done in the digital space? Degree of restrictiveness will be a key impact determinant.
- **Innovative capacity** in the development of digital world tools (e.g. software, apps, mobile payment systems): **integration vs fragmentation**: interoperability, convergence, attitudes of the big players / incumbents / eco-systems, entry of small players and their scope, **and market size**
- **Attitudes and willingness to use digital platforms** in different aspects of life (social interactions, commerce, banking, navigating, etc.), *e.g. could imagine a 'backlash' and increasing resistance to "having your life online"*
- **Skills** (consumers and businesses, business leaders); skills shortages? E.g. data scientists, dually skilled people, entrepreneurship, bringing innovation to market
- **Technological developments**: what will emerge as the prevailing - and next - technology / platform? Uncertainty around investments in new technologies



Unlocking EU Growth Potential by Enabling ICT-driven Growth

Scenarios for 2017—integrating European markets is key

ENABLING PEOPLE AND BUSINESS is key to letting **ICT play its role in innovation and growth.**

THE TIME TO ACT IS NOW to prevent Europe from losing its digital competitiveness while others are racing ahead.

SCALE and reduced fragmentation provide firms with market size and scope to experiment innovate and grow.

COMPETITION provides lower prices and greater choice to consumers.

ENTREPRENEURSHIP and **SKILLS** support ICT-readiness to embrace innovation and change.

NATIONAL GOVERNMENTS and the **EUROPEAN COMMISSION** should coordinate action on the three policy pillars.

Low degree of integration in the Single & Digital Market



Higher Global Growth >4.5%



High degree of integration in the Single & Digital Market

Slower Global Growth <3%



Higher Global Growth >4.5%

Digital Savannah

Fragmented EU market hampers firm growth with lack of scale opportunities. Companies may skip the EU market and go global. EU firms will be acquired by non-EU firms. EU consumers and business continue to face high prices and limited choice.

1.1%
EU
GDP
Growth

20%
ICT

Digital Rainforest

Integrated EU market creates strong businesses which compete globally. Low barriers to entry support creative disruption, rapid change and adjustment. Clustering and specialization across EU. Consumers and business see lower prices and more choice for products and services.

2.5%
EU
GDP

60%
ICT

Digital Desert

Business strategies focus on capturing maximum revenue in domestic markets. Push to protect national champions. Weak firms may be acquired by other EU and non-EU firms. ICT products & services do not provide optimal benefit to consumers and business in terms of price and choice.

0.8%
EU
GDP

10%
ICT

Digital Greenhouse

National champions compete for market share within slow EU and global economy. Protectionist attitudes at EU-level to non-EU firms but prevent EU firms to lead globally. Prices may drop, but consumers and business will not have access to highest quality goods and services

1.1%
EU
GDP

40%
ICT

Slower Global Growth <3%



Three policy principles drive productivity through digitalisation

1. Pre-conditions for reaping ICT-driven growth benefits need to be secured by a high-quality and affordable infrastructure in all sectors
 - ✓ Should be matched by investments in the soft infrastructure to raise the share of intangible relative to tangible investment in the economy – government can provide appropriate investment conditions
2. Governments need to focus on facilitating a regulatory environment in which businesses in the ICT and non-ICT sector can thrive (and fail).
 - ✓ The single digital market is the first step towards creating larger network effects from the use of ICT
3. Government and business should work together to foster the skills and willingness to use ICT and support overall ICT readiness
 - ✓ Provide and facilitate platforms, especially at regional and local level
 - ✓ Government can lead by example



A revised policy narrative needs to support the supply side with the aim to enable and foster aggregation of demand (1/2)

1. Urgency to act is now because of rapid changes in digital technology and use
2. Complete the Single Market (especially in services) and the Single Digital Market
3. Remove barriers through the reduction, removal, and harmonisation of standards, rules, regulations, and laws that inhibit the aggregation of demand
4. Focus on needs and use of consumers and businesses: simplify rules and procedures (e.g. for engaging in cross-border activities and recruitment) and access to finance, especially for smaller firms and start-ups (where many of the new jobs will be created)



A revised policy narrative needs to support the supply side with the aim to enable and foster aggregation of demand (2/2)

5. Balance between scale (to support aggregation of demand) and competition (to support diversity of offerings and keep competitive pricing)
6. Give innovation and new business models room to develop by enabling and facilitating change and experimentation
7. Member State governments and the EU can use government procurement policies to aggregate demand across borders and put in place experimental and pilot programs to further integrate cross-border capabilities
8. Monitor implementation in practice



A commitment to productivity growth through innovation and digitalisation is key to achieve the Europe 2020 goals

- The EU is well positioned to benefit from the potential of ICT investment and digitalisation.
- There is no unique “European” problem making growth more difficult than anywhere else in the advanced world.
- Structural reforms are necessary starting point to help to reallocate resources away from less to more productive activities and sectors
- Policies that drive single market integration are the most important prospect for a European growth bonus beyond individual states
- Pre-conditions for reaping ICT-driven growth benefits need to be secured by a high-quality and affordable infrastructure in all sectors
- Governments should play a key role in making the necessary intangible investments and reforms to the educational system

