Infrastrutture intangibili e competitività

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Outline

- What is intangible investment
- Why is it important?
- How can it be measured?
- How does its measurement affects the traditional GDP accounting
- How does intangible capita differ across countries?
- Its impact on economic growth
- Its impact on international competitiveness and global value chains

General Framework

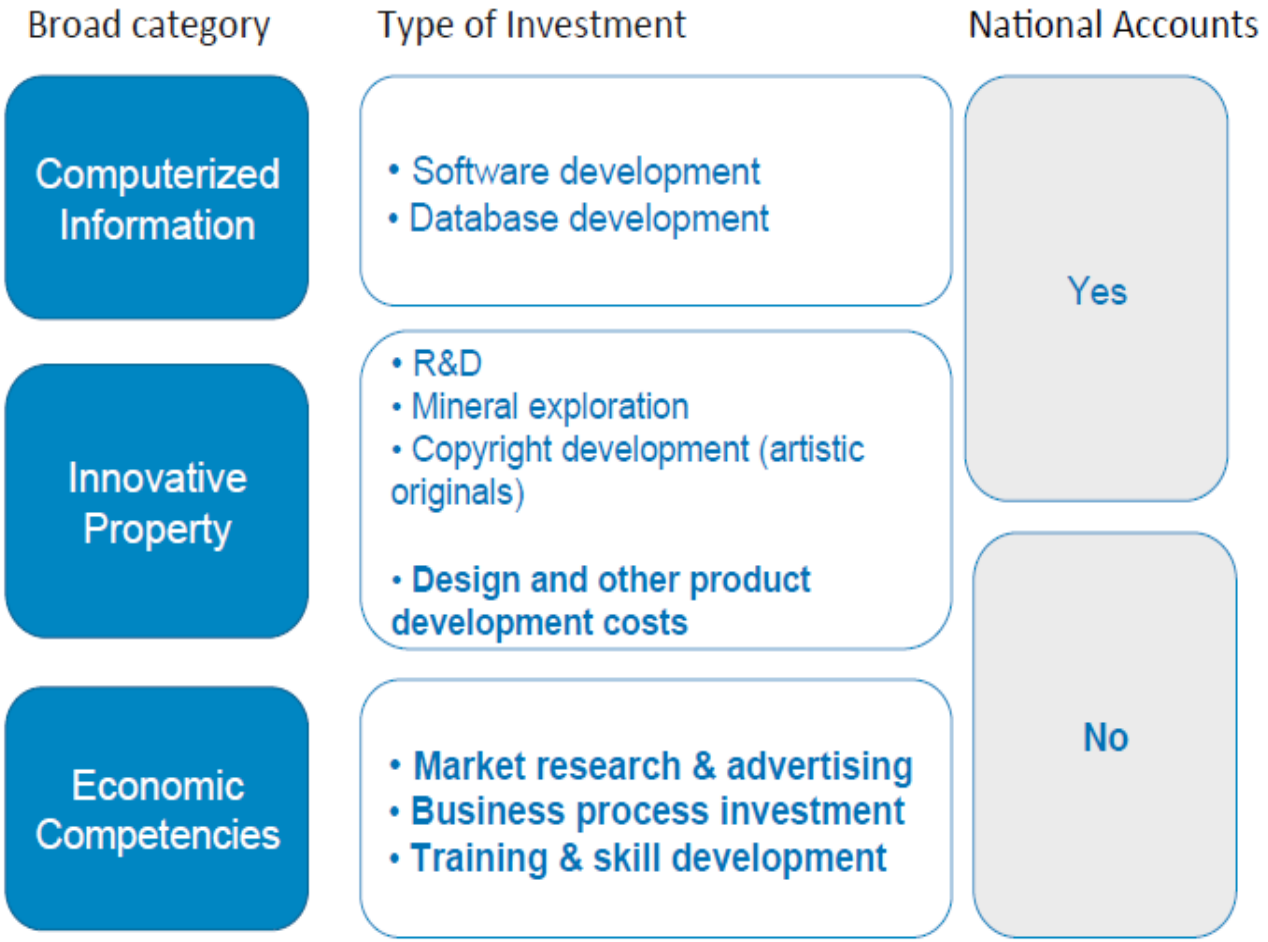
- The last 20 years have seen deep transformations in the factors affecting countries' international competitiveness
- The Information and Communication Technology (ICT) revolution has transformed modes of production and internationalization in both the manufacturing and service sectors. Fourth industrial revolution?
- Increasing interdependence between manufacturing and services
- International fragmentation of production or second unbundling where firms/countries specialise in portions of the value chain and trade other portions of it
- We cannot understand growth and competitiveness in the new economy (or knowledge based economy) without considering intangible or knowledge-based capital

Research Questions

What is the role of intangible assets for:

- Sources of growth
- Ability to participate in global value chains
- Value added appropriation along the chain
- Are there differences across assets and across sectors (manufacturing versus services)?

What are intangibles and are they capitalised?



Source: Corrado, Hulten and Sichel 2005, 2009

Measuring intangible capital

The changing nature of the global economy has placed novel attention on intangible capital as a new source of growth thus asking for coordinated measurement efforts.

EU FP7 Funded Projects for measuring business intangibles

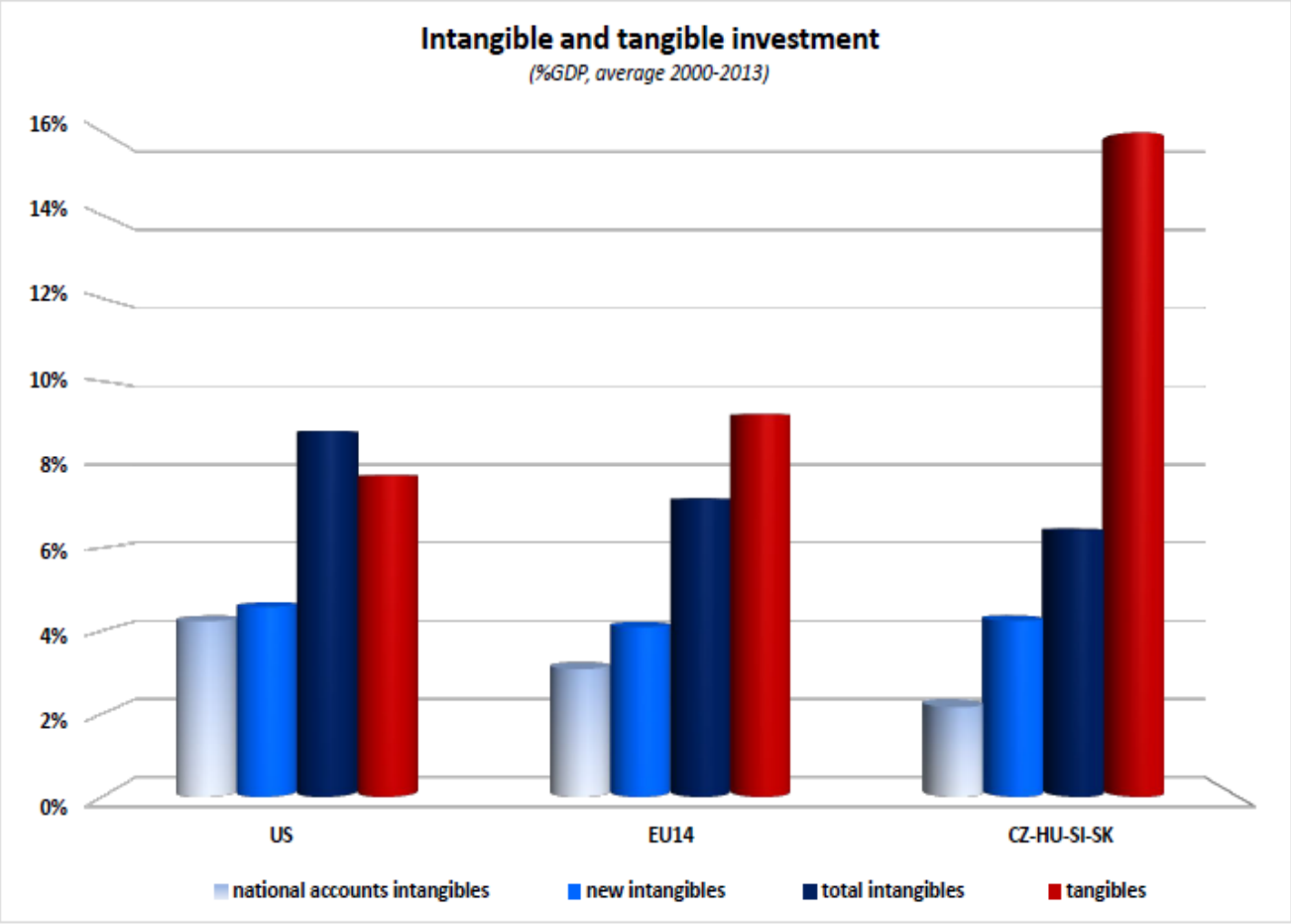
- **INNODRIVE**: new macro and firm level data on intangibles and new estimates of the capacity of intangible capital to generate growth. Aimed at broad coverage of intagibles.
- **COINVEST**: macro and micro analysis to evaluate the contribution of intangible investments to innovation, competitiveness, growth and productivity in Europe. Focused on in-depth country-specific research.

The two projects led to the (unfunded) **INTAN-Invest** research collaboration that constructs and maintains a harmonized dataset on intangible capital investments by industry for 28 EU countries plus the United States (www.intaninvest.net).

From business to public sector estimates of

- INNODRIVE, COINVEST and INTAN-Invest made possible the evaluation of the contribution of market sector intangibles to economic growth.
- **SPINTAN**: (Funded under the EU FP7 framework) supported the effort to develop a framework to measure intangible investment in the nonmarket sector (see Corrado, Haskel and Jona-Lasinio (2017)).
- SPINTAN extended the asset boundary of national accounts to include intangible investment in asset types as set out in Corrado et al. (2017), who adapted the framework of Corrado, Hulten, and Sichel (2005, 2009) to the nonmarket institutional sector setting (i.e, governments and nonprofit institutions).
- The production boundary of existing GDP was unchanged, which is to say production by households remained outside the scope of analysis.

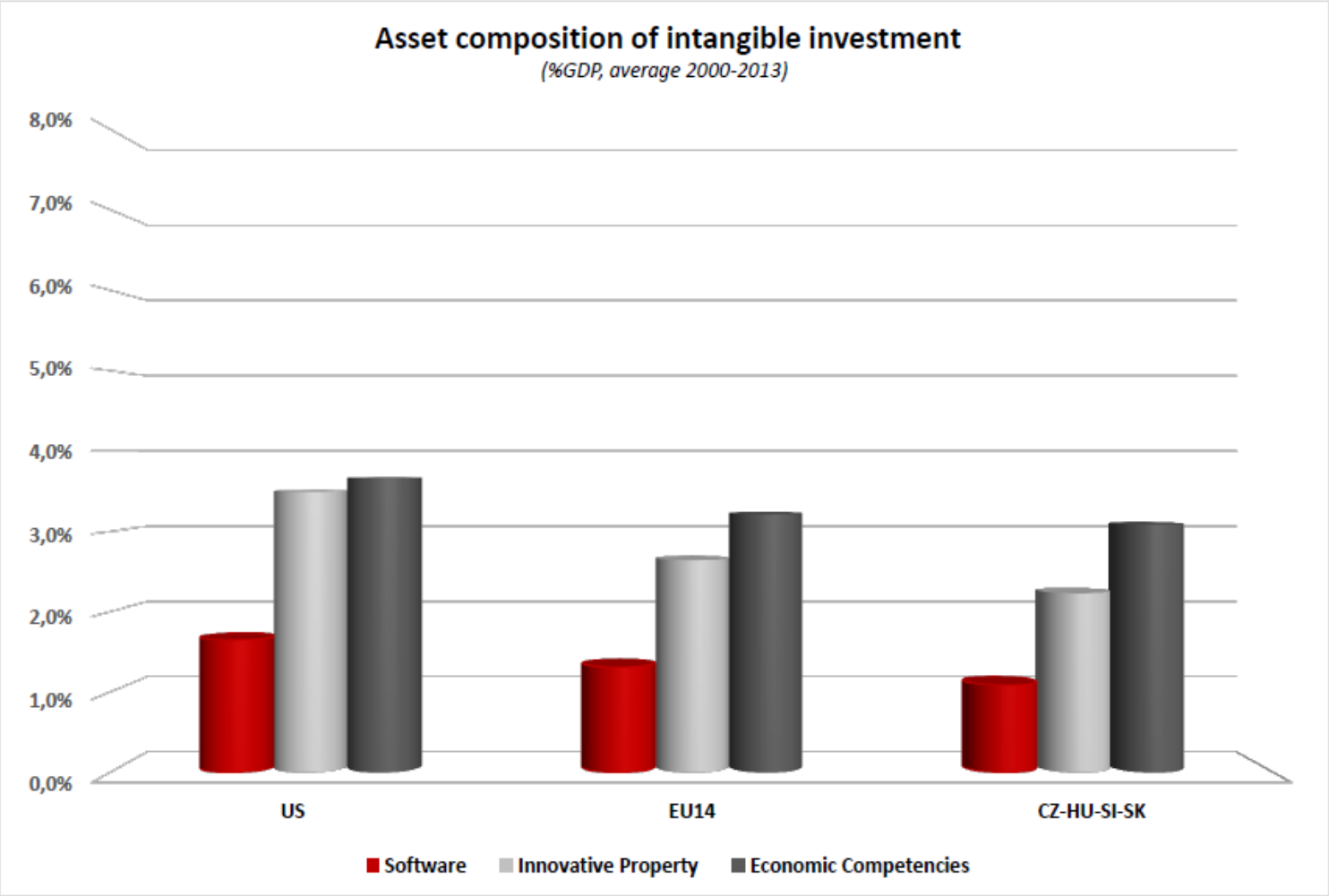
- US relatively more intangible intensive than the EU economies
- NA intangibles account for 4%-3% of GDP and new intangibles for 4%-4.5%
- US intangibles outpaced tangible investment



Source: Corrado, Haskel, Jona-Lasinio, Iommi (2016), "Growth, tangible and intangible investment in the EU and the US before and since the Great Recession", EIB Investment Report, 2016

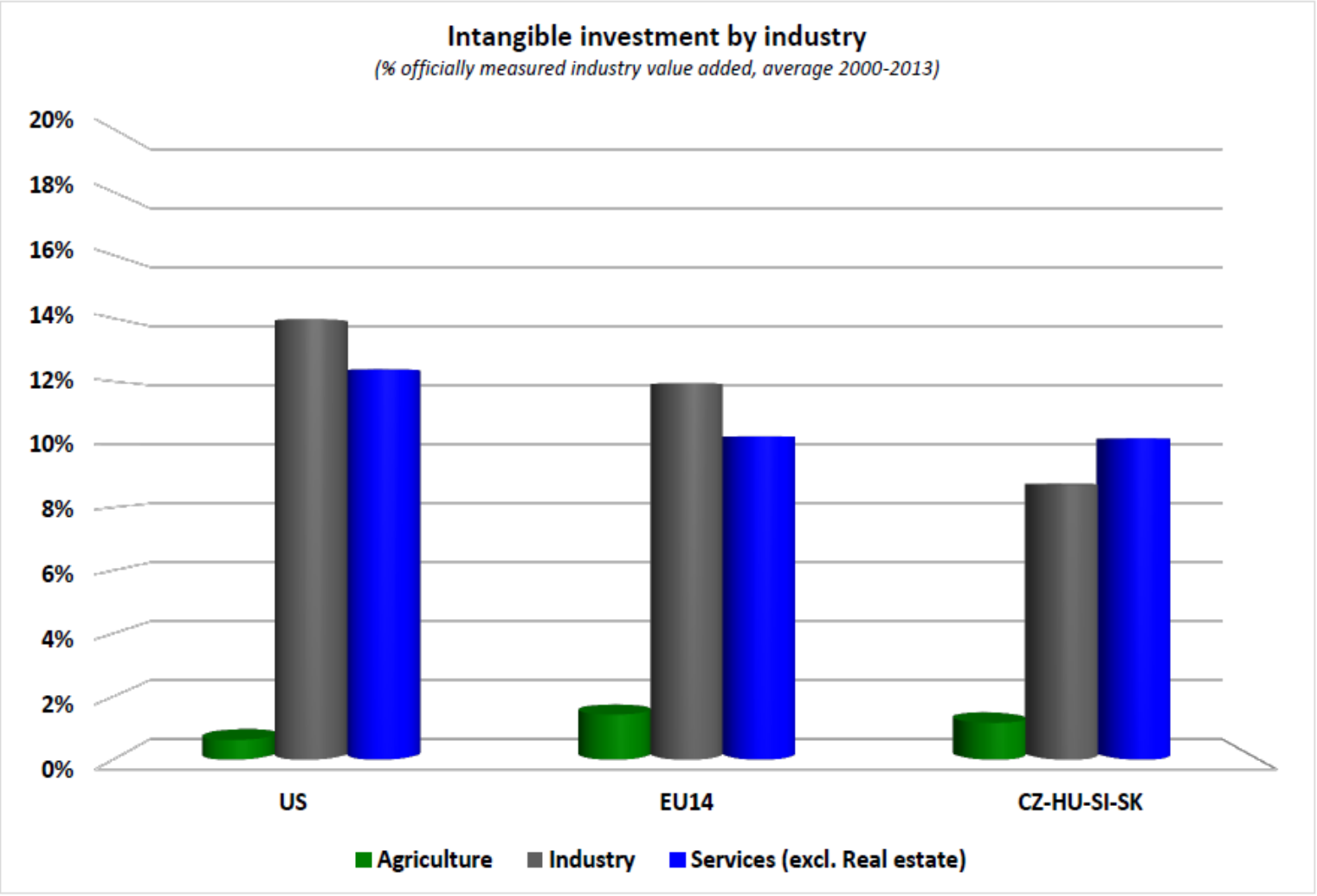
Composition of business intangible investment

Economic competencies are the main driver of intangible investment



Source: Corrado, Haskel, Jona-Lasinio, Iommi (2016), "Growth, tangible and intangible investment in the EU and the US before and since the Great Recession", EIB Investment Report, 2016

Business intangibles across industries



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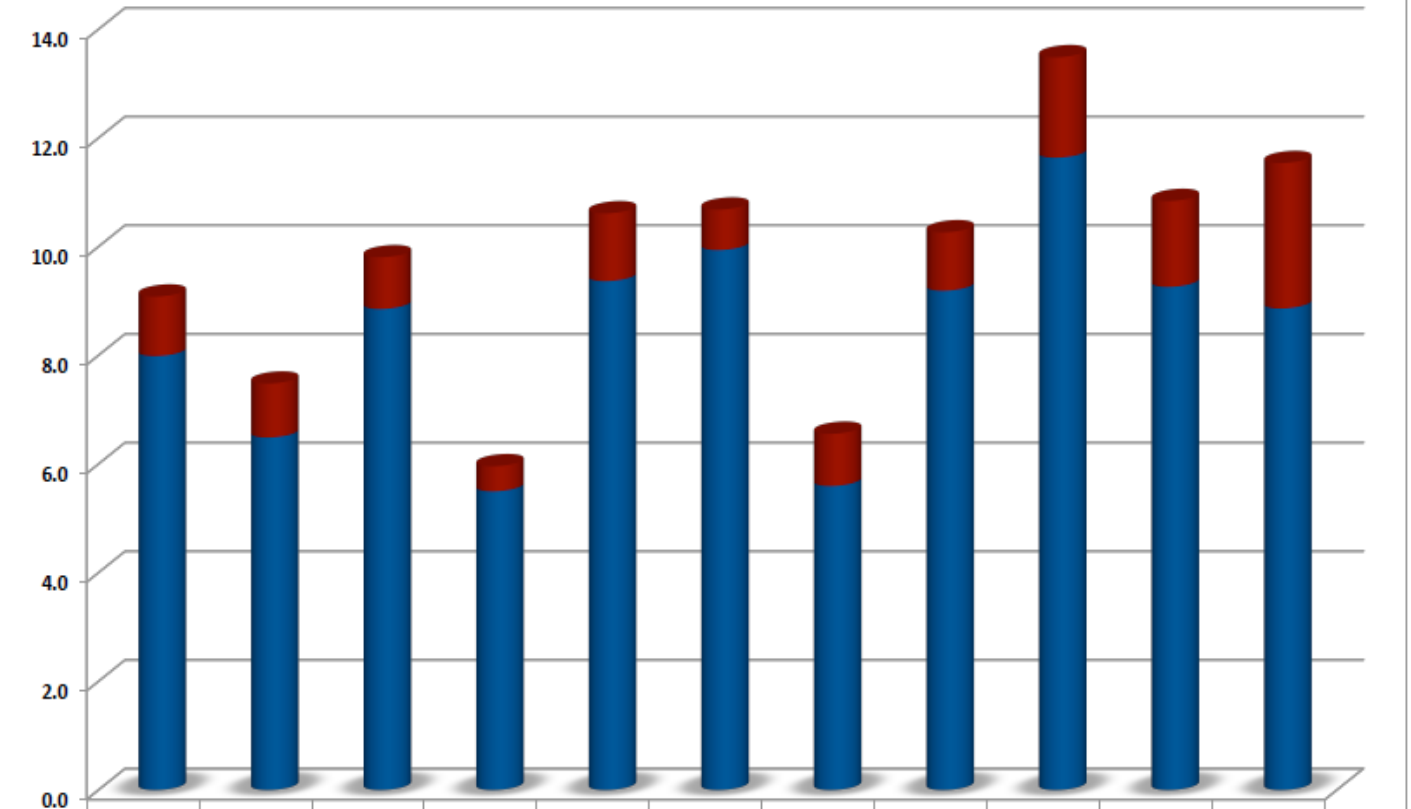
Market and nonmarket intangibles: adjusted value added shares (2013)

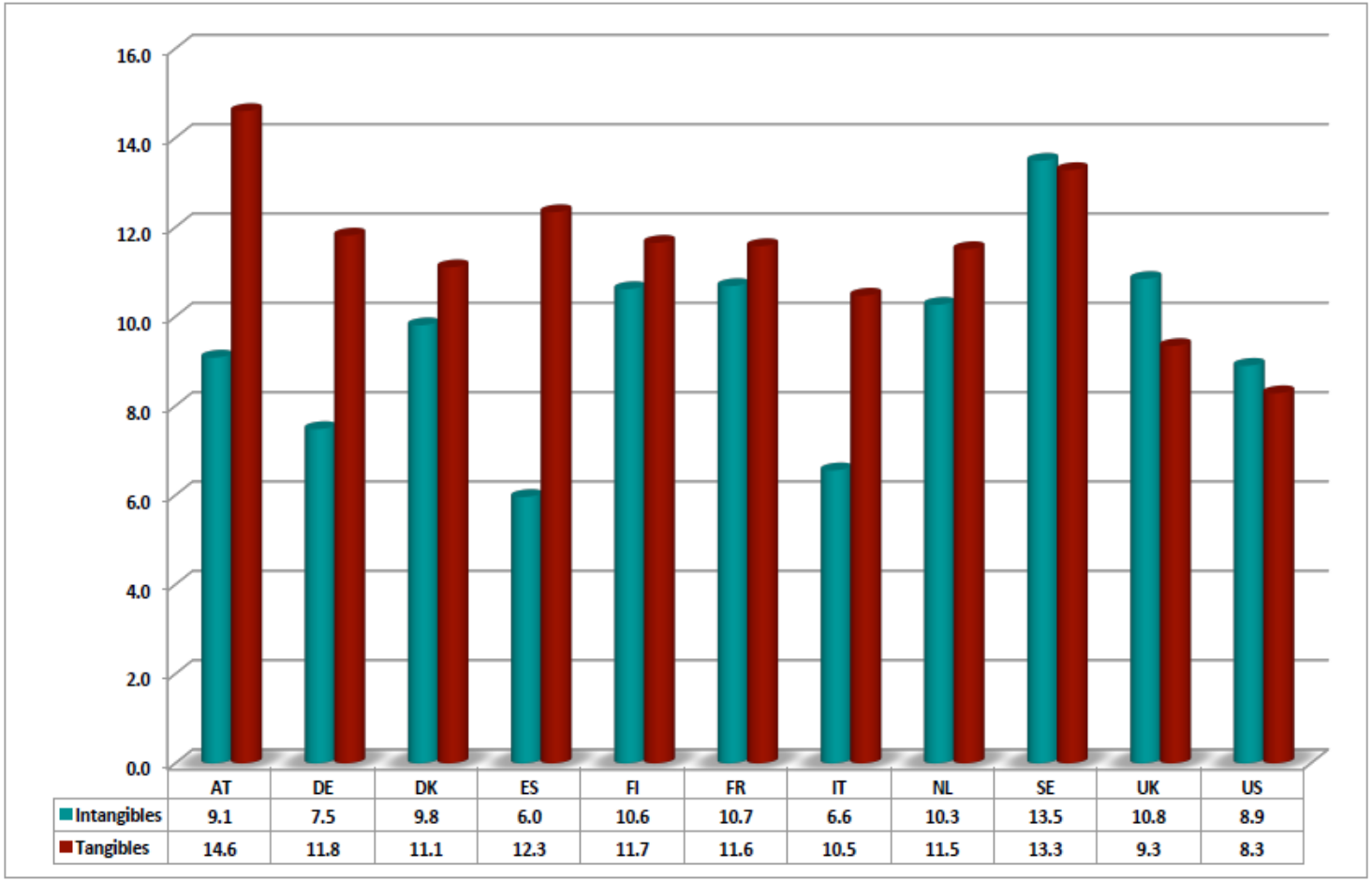
Non-market intangible investment (on this measure) is small. Overall (market and nonmarket) intangible investments account for 14% to 6% of value added with market and nonmarket sectors accounting on average for 8% and 1.5% respectively.



	AT	DE	DK	ES	FI	FR	IT	NL	SE	UK	US
NMKT	1.1	1.0	1.0	0.5	1.2	0.7	1.0	1.1	1.9	1.6	2.7
MKT	8.0	6.5	8.9	5.5	9.4	9.9	5.6	9.2	11.6	9.3	8.9

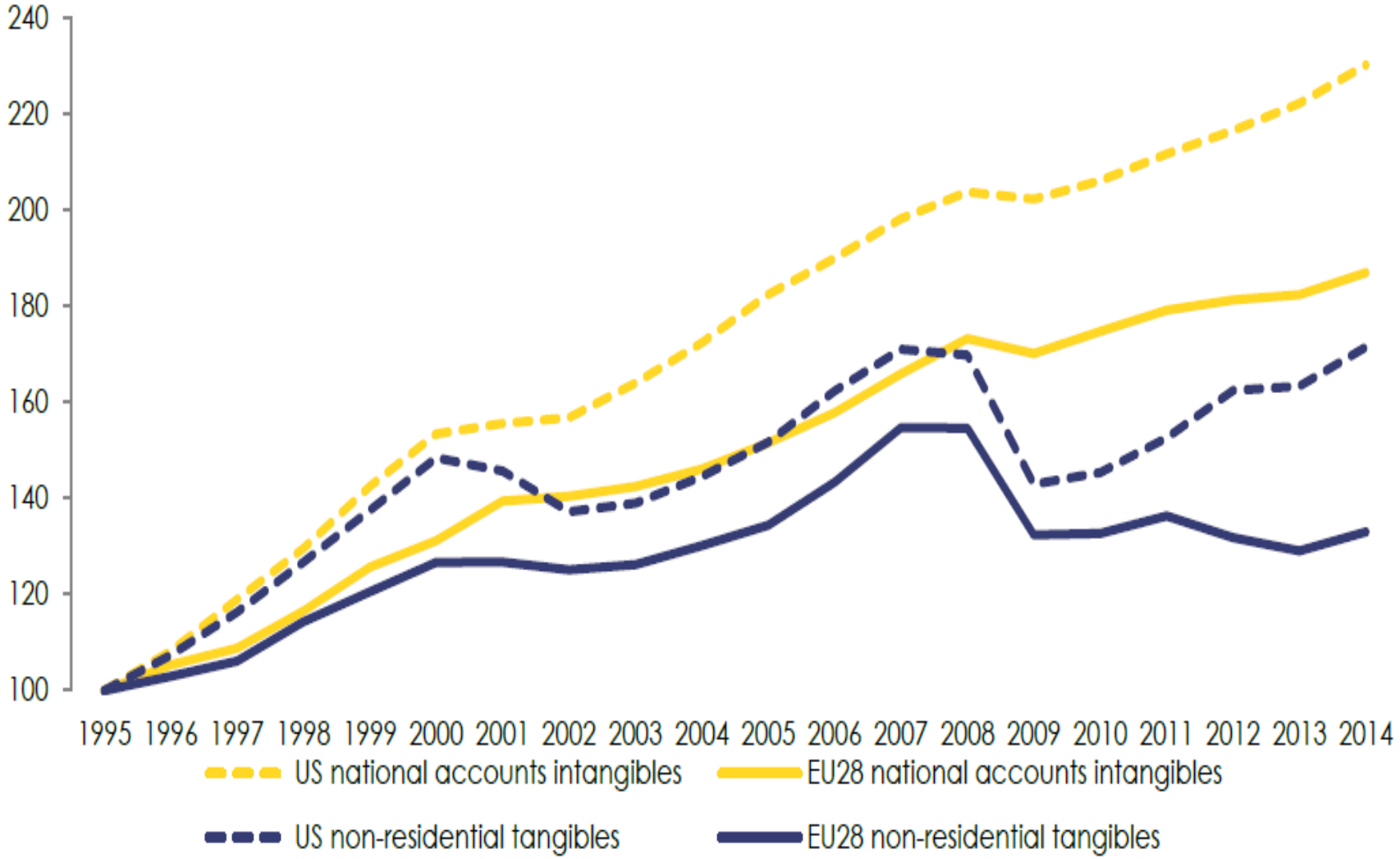
Tangible and intangible investment in the total economy: (adjusted) value added shares (2013)

UK, US, SE: intangibles account for a larger value added share than tangibles. For ES and IT it is the opposite.



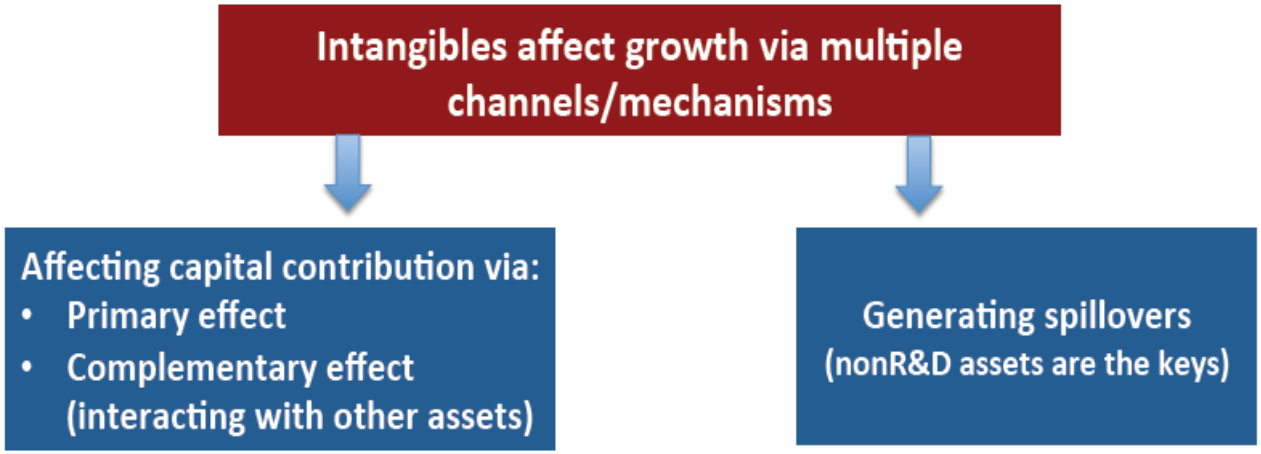
	AT	DE	DK	ES	FI	FR	IT	NL	SE	UK	US
Intangibles	9.1	7.5	9.8	6.0	10.6	10.7	6.6	10.3	13.5	10.8	8.9
Tangibles	14.6	11.8	11.1	12.3	11.7	11.6	10.5	11.5	13.3	9.3	8.3

Intangible and tangible investment in the EU 28 and



Sources: Eurostat national accounts for EU-28, BEA for U.S.

The contribution of intangibles to economic growth: channels



The contribution of intangibles to economic growth: results

- The seminal paper by Corrado et al. (2005) is the first of a number of studies showing that intangible capital is an essential ingredient for economic growth.
- They calculated that previously unmeasured intangible capital contributed 0.24 of a percentage point (18 per cent) to conventionally-measured Multifactor Productivity (MFP) growth in the United States between the mid-1990s and early 2000s.
- The same methodology has been applied in a number of other country studies — with estimates of the contribution of previously unmeasured intangible capital to MFP growth of 14 per cent (United Kingdom in Marrano et al. 2007), and 3 per cent (Finland in Jalava, et al. 2007) over a similar period.
- Other country studies estimated only the contribution of all intangibles to MFP growth — -19 per cent in Japan (Fukao et al. 2008), 19 per cent in France, 18 per cent in Germany, 9 per cent in Spain and 0 per cent in Italy (Hao et al. 2008).
- More recently, Corrado et al. (2014) found that intangibles generate spillovers to the economic system thus fostering also indirectly productivity growth.

Intangible capital and international

Factors affecting international competitiveness: from costs to innovation.

- Kaldor paradox
- Technology gap approach
- New trade theory

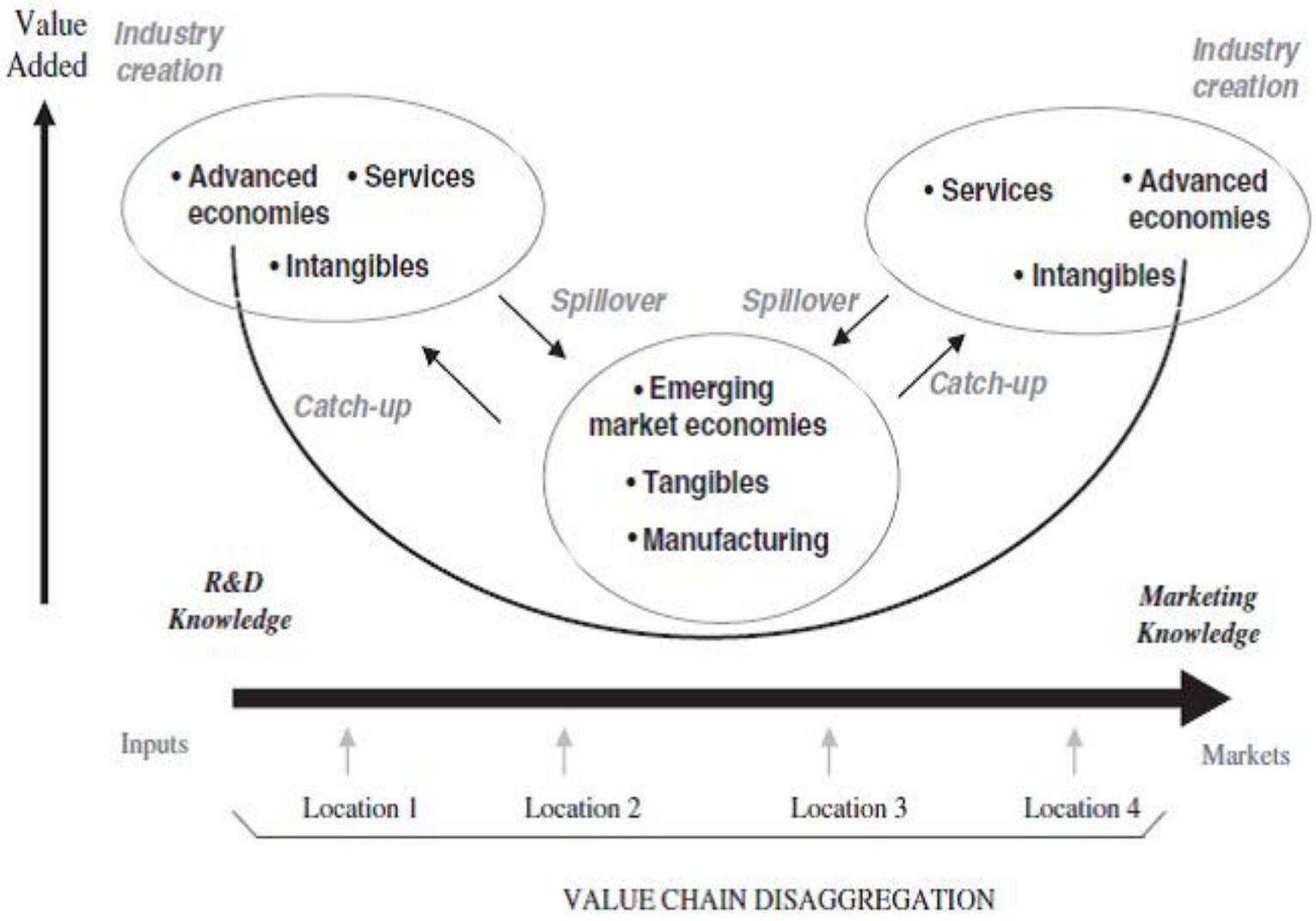
Innovation always measured by R&D expenditures and/or patents

From R&D to a more complex view of intangible assets?

The role of intangible capital in global value

- There is evidence that a great part of the value added of a final product is created in the first and last stages of the production process (R&D, design, marketing and sales), while firms involved in intermediate stages (such as the production of components and assembly) reap only a small part of the final value of the good or service produced (Mudambi, 2007; 2008).
- The pattern of value-added along the value chain may, therefore, be represented by the ‘smiling curve’ (Everatt et al., 1999) or the ‘smile of value creation’ (Mudambi, 2007):
- The classic example of the iPod supply chain discussed by Dedrick et al. (2010) shows that Apple captures between one-third and one-half of an iPod’s retail value, Japanese firms such as Toshiba and Korean firms such as Samsung capture another major share while firms and workers in China capture no more than 2 percent from assembling the product.

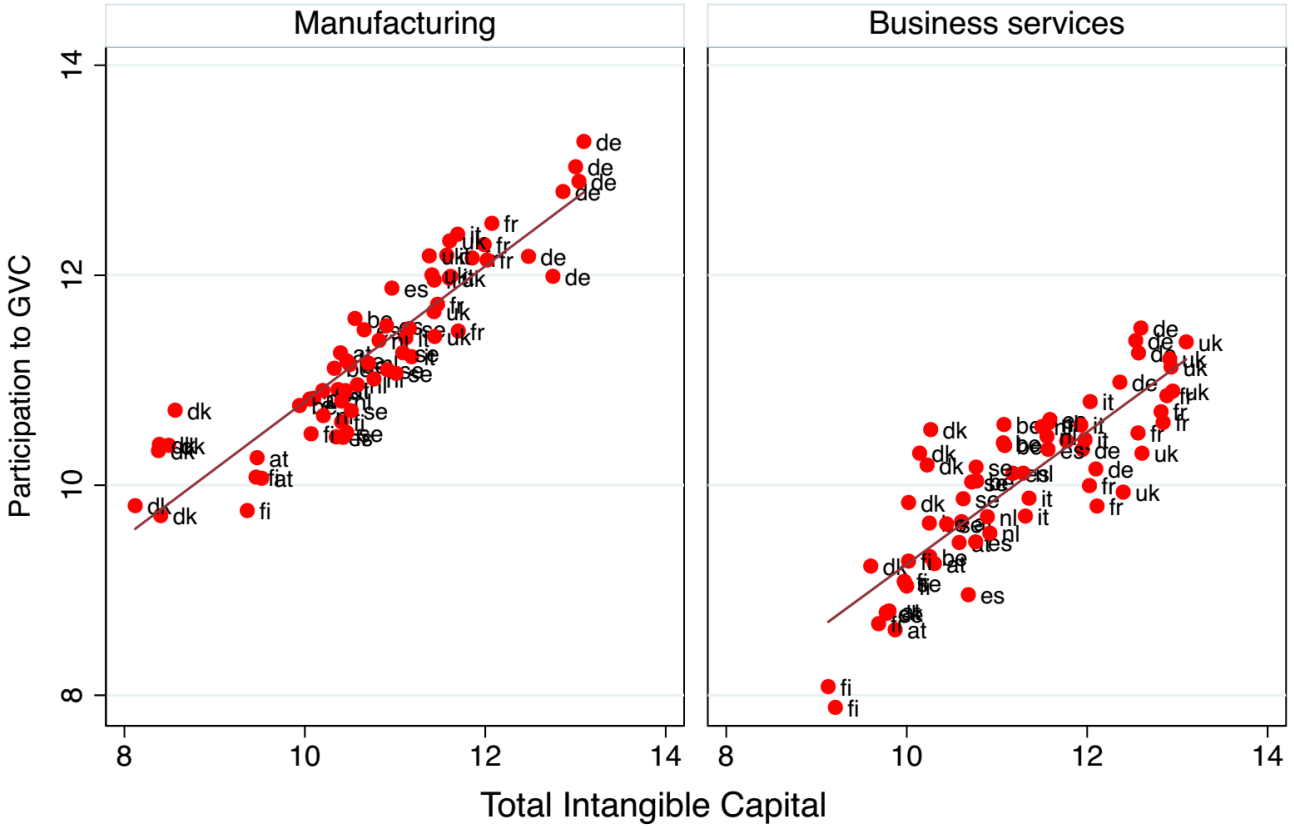
The smiling curve



Intangible assets and GVC: hypotheses

1. Advanced countries with a higher level of investment in intangible assets have a relatively higher level of participation in global value chains.
2. Different intangible assets contribute differently to explain participation in GVC in manufacturing and service industries. R&D is expected to play a larger role for manufacturing than for services while ICT and other non-R&D intangibles are expected to be equally important in both sectors
3. Benefits from participation in GVC (in terms of net value added appropriation) increase with investment in intangible assets

Participation in GVC and intangible assets



Estimated equations

$$\ln Y_{i,c,t} GVCj = \alpha_1 \ln K_{i,c,t} Intgs + \alpha_2 \ln K_{i,c,t} ICT + \alpha_3 \ln K_{i,c,t} Non\ ICT + \alpha_4 \ln X_{i,c,t} + \delta_t + \gamma_i + \varepsilon_{c,i,t}$$

c=country (11 EU member countries), i=industry (manufacturing and total market services), and t=time (1995, 2000, 2005, 2008-2011). Y GVCj represents GVC participation and gains from GVC. KIntgs is intangible capital with s=Total Intangible Assets, R&D, Training, Design, Brand (advertising and marketing), Organizational capital; KICT is ICT capital and KNon ICT is tangible Non ICT capital stock; X are other controls (corporate income taxes, country size, product market regulation, public expenditure on education as a share of GDP); δt and γi are time and industry dummies. All variables are in per hour terms

Results

1. Total intangible assets positively affect participation in global value chains. Non-R&D intangibles play a larger role than R&D with training being the main driver
2. R&D is positively correlated to GVC participation only in manufacturing while non-R&D intangibles matter for participation both in manufacturing and in services.
3. Intangible capital is positively related to value appropriation and this result is robust to introducing separately R&D and non-R&D intangible assets. Among them training and organizational capital have the larger effect on value appropriation.

Conclusions

- Intangible capital is as important as fixed/tangible capital and its importance is growing over time
- There are important cross-country differences in the weight of intangible capital
- The empirical evidence shows that intangible capital is a main driver of economic growth and international competitiveness
- While traditional innovation variables work better for capturing competitiveness in manufacturing, non-R&D intangibles better explain competitiveness in services
- While it can be easier than in the past to take part to global production processes, intangible assets determine which firms/countries benefit more from this participation

Implications

- The descriptive evidence has also shown the heterogeneous behavior of US and European countries in terms of intangible capital accumulation
- Higher efforts at the European level to encourage public and private investment in intangibles
- Within Europe the low figures for Mediterranean countries suggest that these countries are in a vicious circle of low investment in high value added creating activities and low growth
- Provide the “right” incentives for national government to invest in these assets

Next steps

- Study the contribution of each intangible to growth and to the industry position in the GVC
- Linking intangible investment and GVC participation to productivity
- Evaluation of international flows of intangibles and their role in the global economy