

Looking for a virtuous pattern of growth: Some insights for the discussion

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*Based on Mas, M. and E. Benages (2016): “Looking for a virtuous pattern of growth. Some insights for discussion”, *Ekonomiaz* 89, 1st semester, 86-117*

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Motivation

European Commission Communication (2014), *For a European Industrial Renaissance*:

“Europe urgently needs to strengthen the basis for post-crisis sustainable growth and modernization. To that end, it must send a clear signal of **its commitment to reindustrialization**, the modernization of Europe’s industrial base and the promotion of a competitive framework for EU industry” (pg. 22).

After listing a set of measures to achieve this goal, it concludes by defining a very **precise target**: “Finally, the objective of revitalization of the EU economy calls for the endorsement of the reindustrialization efforts in line with the Commission’s aspiration of raising the contribution of industry to GDP to **as much as 20% by 2020**” (pg. 23).

What the data says

Table 1.
Share over GVA and employment and annual rates of growth. Manufacturing and services. 1995-2014

	Share of total GVA				GVA annual growth rates 1995-2014		Share of total employment				Employment annual growth rates 1995-2014	
	Manufacturing		Services		Manufacturing	Services	Manufacturing		Services		Manufacturing	Services
	1995	2014	1995	2014			1995	2014	1995	2014		
Austria	20,0	18,4	65,4	70,6	2,3	2,0	18,7	14,7	63,8	72,5	-0,3	1,6
Belgium	20,4	13,8	69,6	77,2	1,8	1,7	17,5	11,2	72,9	80,4	-1,5	1,4
Bulgaria	14,0	14,7	61,0	67,6	2,7	1,8	22,6	17,1	46,1	55,6	-1,6	0,8
Croatia	20,5	14,3	60,5	69,8	1,2	2,4	-	17,1	-	63,6	-	-
Cyprus	10,5	5,0	73,1	86,9	-1,8	3,1	14,7	7,7	67,0	80,2	-2,3	2,0
Czech Republic	23,7	26,6	56,7	59,3	5,5	1,8	26,5	26,1	54,5	59,9	-0,1	0,5
Denmark	17,0	13,5	71,2	75,6	0,8	1,6	16,5	10,3	72,2	80,1	-2,2	0,9
Estonia	19,8	15,7	62,4	68,4	5,4	4,0	24,7	18,4	55,6	67,4	-1,8	0,8
Finland	25,4	16,7	62,0	70,6	2,6	1,8	19,3	13,7	65,6	73,1	-0,8	1,6
France	16,2	11,2	72,7	78,9	1,4	1,8	15,0	9,9	73,1	79,6	-1,5	1,2
Germany	22,8	22,6	66,0	69,0	1,7	1,5	21,2	17,5	65,8	73,9	-0,4	1,2
Greece	12,1	9,4	70,3	80,4	-0,8	1,3	11,2	8,4	62,3	73,9	-1,8	0,6
Hungary	21,5	23,5	61,0	64,4	3,7	1,9	22,0	19,2	54,0	65,9	-0,4	1,3
Ireland	23,0	19,7	61,5	72,8	4,8	4,5	-	11,1	63,1	76,0	-1,8	2,6
Italy	20,9	15,4	67,6	74,3	-0,4	0,8	21,2	16,2	65,1	72,4	-0,9	1,1
Latvia	20,0	12,2	60,8	73,4	2,7	4,6	-	13,7	54,9	68,8	-1,9	0,7
Lithuania	18,7	19,3	57,4	66,0	6,1	4,3	17,3	15,1	55,0	66,1	-1,3	0,3
Luxembourg	13,3	4,9	76,7	87,8	-0,1	3,8	-	8,1	70,3	79,3	0,3	3,8
Malta	20,7	10,0	68,0	82,8	-	-	24,5	12,0	65,0	78,9	-2,4	2,4
Netherlands	17,2	12,1	69,6	77,0	1,5	2,3	12,9	8,8	76,2	82,9	-1,0	1,4
Poland	18,2	18,6	56,5	64,6	6,6	3,4	-	19,1	45,2	58,3	-0,3	1,7
Portugal	18,1	13,3	66,4	76,1	1,0	1,7	22,2	15,4	52,6	65,9	-2,0	1,2
Romania	25,2	23,0	42,5	58,4	2,3	2,7	21,2	18,1	26,9	42,0	-2,4	0,8
Slovakia	25,7	20,9	57,5	62,0	6,9	2,2	26,2	21,6	54,1	65,6	-0,8	1,3
Slovenia	25,3	23,1	61,0	64,7	3,1	2,6	30,0	20,3	47,0	62,4	-2,0	1,5
Spain	17,6	13,2	65,1	75,1	0,9	2,7	17,2	11,1	65,3	78,2	-0,9	2,3
Sweden	22,8	16,4	65,9	72,6	3,2	2,3	17,5	12,3	72,6	77,1	-1,2	1,0
United Kingdom	18,8	10,6	68,5	78,4	0,0	2,7	15,8	8,1	74,5	83,0	-2,6	1,5
EU28	19,7	15,5	66,8	73,3	1,6	2,0	19,0	14,0	63,0	73,2	-1,1	1,3
EU15	19,6	15,1	68,0	74,8	1,1	1,9	18,0	12,7	68,6	77,1	-1,1	1,4
New Member States (NMS)	20,9	20,3	55,6	63,3	4,9	2,7	22,3	19,4	43,8	57,1	-1,0	1,2
Norway	12,5	7,8	63,8	60,1	1,6	2,8	12,9	9,2	74,6	76,9	-0,4	1,5
Switzerland	19,8	19,0	71,3	73,0	2,3	1,8	-	14,0	-	74,3	-	-
Australia	14,0	6,8	67,8	70,2	0,8	3,4	14,2	8,7	72,1	76,3	-0,8	2,1
Canada	17,4	10,4	67,9	70,5	0,7	4,2	14,0	9,6	74,6	78,2	-0,6	1,8
China	34,8	29,9	32,9	46,1	10,0	10,1	15,7	18,7	24,8	38,1	1,7	3,1
India	17,4	12,9	46,2	57,0	6,1	8,1	12,4	11,4	21,1	26,3	1,2	2,9
Japan	23,5	20,4	63,7	70,4	1,4	0,8	20,4	15,1	61,2	71,3	-1,9	0,6
Korea	27,8	31,0	54,6	59,3	6,4	4,1	22,7	16,9	55,6	70,0	-0,4	2,4
Taiwan	27,4	29,0	61,0	64,8	5,9	3,6	27,1	27,3	50,7	59,6	1,1	2,0
US	16,8	12,0	74,7	78,5	2,3	2,5	15,3	10,2	73,8	79,8	-1,3	1,3

Source: ABS, APO, BEA, Canada Statistics, Eurostat, ILO, OECD and own elaboration

GVA and Employment Performance. Main facts

1. The only **countries** which had already achieved in **2014 the 20%** target were, in the EU28 **five NMS**: Czech Republic (26.6%); Hungary (23.5%); Romania (23.0%); Slovakia (20.9%); Slovenia (23.1%) **plus Germany** (22.6%). Within the non-EU group: China (29.9%); Japan (20.4%); Korea (31.0%); and Taiwan (29%). And **only three**: Czech Republic, Hungary and Taiwan **increased the share** from 1995 to 2014.
2. Thus, the **loss of weight of manufacturing** on total economic activity is (almost) **a general phenomenon**. The **destruction of manufacturing employment** is a generalized fact.
3. The **service sector** presented **positive growth** rates in all countries without exception, both in terms of **GVA and employment**.

What the data says

Table 2.
Labour productivity.
1995-2014
(euros PPS per person and percentages)

	1995			2014			Annual growth 1995-2014			Contribution to labour productivity growth (pp.)	
	Total	Manufacturing	Services	Total	Manufacturing	Services	Total	Manufacturing	Services	Manufacturing	Services
Austria	46.536	47.594	49.328	55.578	79.044	53.292	0,93	2,67	0,41	0,51	0,28
Belgium	53.580	50.709	55.330	63.321	93.862	58.624	0,88	3,24	0,30	0,55	0,22
Bulgaria	13.618	8.100	19.950	20.232	18.211	23.850	2,08	4,26	0,94	0,61	0,60
Croatia	21.543	-	-	30.616	25.646	34.525	1,85	-	-	-	-
Cyprus	35.890	27.161	37.741	42.774	29.623	46.238	0,92	0,46	1,07	0,04	0,85
Czech Republic	25.730	17.188	29.857	39.715	49.262	38.215	2,28	5,54	1,30	1,39	0,75
Denmark	41.215	40.272	40.151	48.780	70.896	45.743	0,89	2,98	0,69	0,45	0,50
Estonia	13.932	7.980	17.135	32.315	31.266	31.394	4,43	7,19	3,19	1,28	2,08
Finland	41.380	40.102	43.609	50.402	76.083	45.732	1,04	3,37	0,25	0,71	0,17
France	48.613	41.556	50.962	57.181	72.320	56.892	0,85	2,92	0,58	0,40	0,44
Germany	45.959	47.923	46.953	53.230	70.407	49.835	0,77	2,02	0,31	0,46	0,21
Greece	35.142	32.925	41.649	42.889	39.311	46.919	1,05	0,93	0,63	0,10	0,47
Hungary	21.651	16.337	27.966	31.262	35.990	30.967	1,93	4,16	0,54	0,94	0,34
Ireland	53.681	57.920	56.677	73.085	133.973	67.997	1,93	5,24	1,14	1,12	0,76
Italy	51.479	46.081	55.398	50.714	50.736	52.364	-0,08	0,51	-0,30	0,09	-0,21
Latvia	12.598	9.880	15.948	30.915	23.796	33.990	4,72	4,63	3,98	0,74	2,67
Lithuania	13.750	12.387	15.863	34.905	50.825	33.396	4,90	7,43	3,92	1,41	2,42
Luxembourg	71.357	52.071	81.119	72.404	48.272	80.091	0,08	-0,40	-0,07	-0,04	-0,06
Malta	-	-	-	-	-	-	-	-	-	-	-
Netherlands	47.377	52.354	44.266	57.064	85.063	52.840	0,98	2,55	0,93	0,37	0,68
Poland	17.758	12.268	26.184	34.727	45.713	36.282	3,53	6,92	1,72	1,27	1,04
Portugal	29.684	19.476	39.045	37.096	33.938	43.362	1,17	2,92	0,55	0,46	0,39
Romania	10.709	11.569	20.316	21.867	28.402	29.044	3,76	4,73	1,88	1,14	0,95
Slovakia	23.456	12.681	30.073	41.599	54.677	35.717	3,02	7,69	0,91	1,79	0,54
Slovenia	25.864	18.099	35.547	41.805	48.102	43.721	2,53	5,14	1,09	1,24	0,68
Spain	46.342	43.223	46.584	52.382	61.787	49.883	0,64	1,88	0,36	0,29	0,25
Sweden	40.415	36.453	41.090	55.516	83.540	51.907	1,67	4,36	1,23	0,86	0,85
United Kingdom	45.340	44.233	42.876	56.479	71.832	54.324	1,16	2,55	1,25	0,38	0,91
EU28	39.781	36.050	44.065	49.715	60.099	49.728	1,17	2,69	0,64	0,48	0,45
EU15	46.343	44.330	47.557	54.023	67.347	52.530	0,81	2,20	0,52	0,38	0,37
NMS	17.127	12.924	25.142	31.739	40.329	33.924	3,25	5,99	1,58	1,24	0,94
Norway	60.146	46.687	43.079	67.149	69.112	55.381	0,58	2,06	1,32	0,21	0,82
Switzerland	48.997	-	-	56.818	81.720	55.347	0,78	-	-	-	-
Australia	46.719	43.165	43.383	60.015	57.898	54.354	1,39	1,63	1,25	0,17	0,86
Canada	48.373	50.842	33.340	57.079	63.697	51.194	0,92	1,25	2,38	0,17	1,65
China	3.293	6.055	4.857	15.227	27.162	17.095	8,51	8,34	6,99	2,70	2,76
India	3.887	5.144	8.312	9.480	12.539	21.518	4,95	4,95	5,28	0,75	2,73
Japan	44.980	44.925	49.490	53.251	81.443	51.283	0,94	3,31	0,20	0,73	0,13
Korea	26.107	26.161	28.700	47.262	92.118	39.128	3,30	6,99	1,72	2,06	0,98
Taiwan	37.775	35.769	47.903	64.327	84.849	64.784	2,96	4,80	1,68	1,35	1,05
US	62.119	51.895	64.623	83.375	102.287	81.621	1,55	3,57	1,23	0,51	0,94

Source: ABS, APO, BEA, Canada Statistics, Eurostat, ILO, OECD and own elaboration.

Productivity Performance. Main Fact

Manufacturing sectors are not more productive than services in all cases or everywhere.

In fact, in some countries services have a higher impact than manufacturing in aggregate productivity, this result being particularly clear for countries with higher aggregated productivity levels, such as the US, Norway, Canada and Australia.

A *virtuous* proposition

We propose a **double criteria** to evaluate the role played by different industries (and aggregations) in economic growth: Their contribution to

1. Aggregate **employment growth**.
2. Aggregate **productivity growth**.

We posit that a sector follows a *virtuous path* when it complies with **both criteria** of creating employment and achieving labour productivity growth.

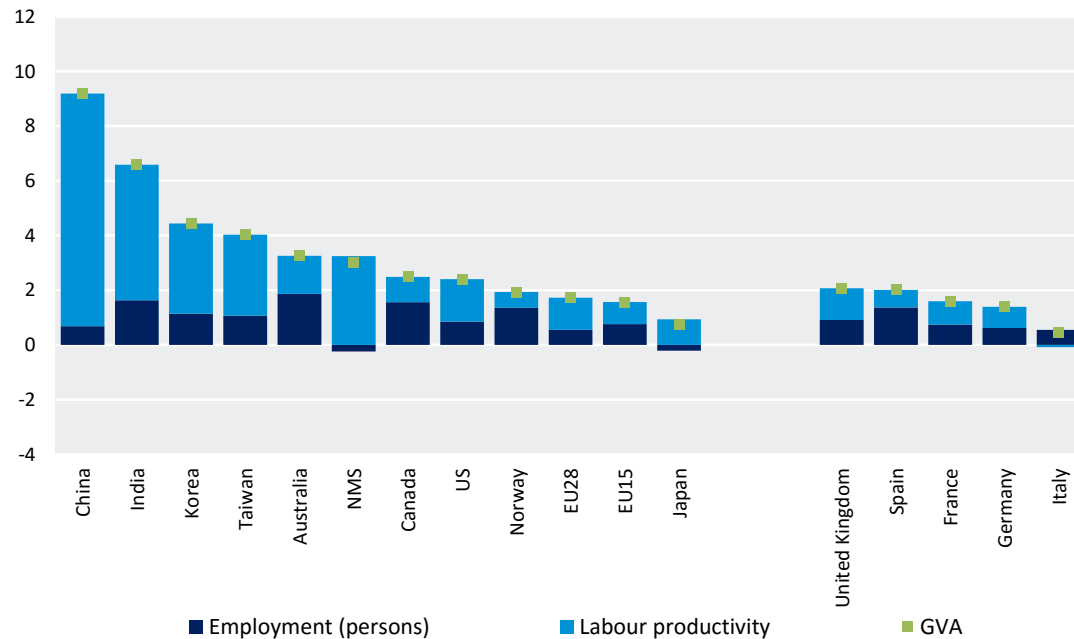
Our approach is in line with Mario **Draghi's** (2012) **definition of competitiveness**: “A competitive economy, in essence, is one in which institutional and macroeconomic conditions allow **productive firms to thrive**. In turn, the development of these firms supports the **expansion of employment**, investment and trade”.

It is also in line with **Delgado et al** (2012) *foundational competitiveness* definition according to which both, the **productivity** of employed workers and the **ability to employ a large** share of the available labour force influence **overall prosperity**.

GVA growth: employment and labour productivity contributions

Figure 1: Contributions of employment and labour productivity to total, manufacturing and services GVA growth in EU and non-EU countries, 1995-2014

a) Total economy

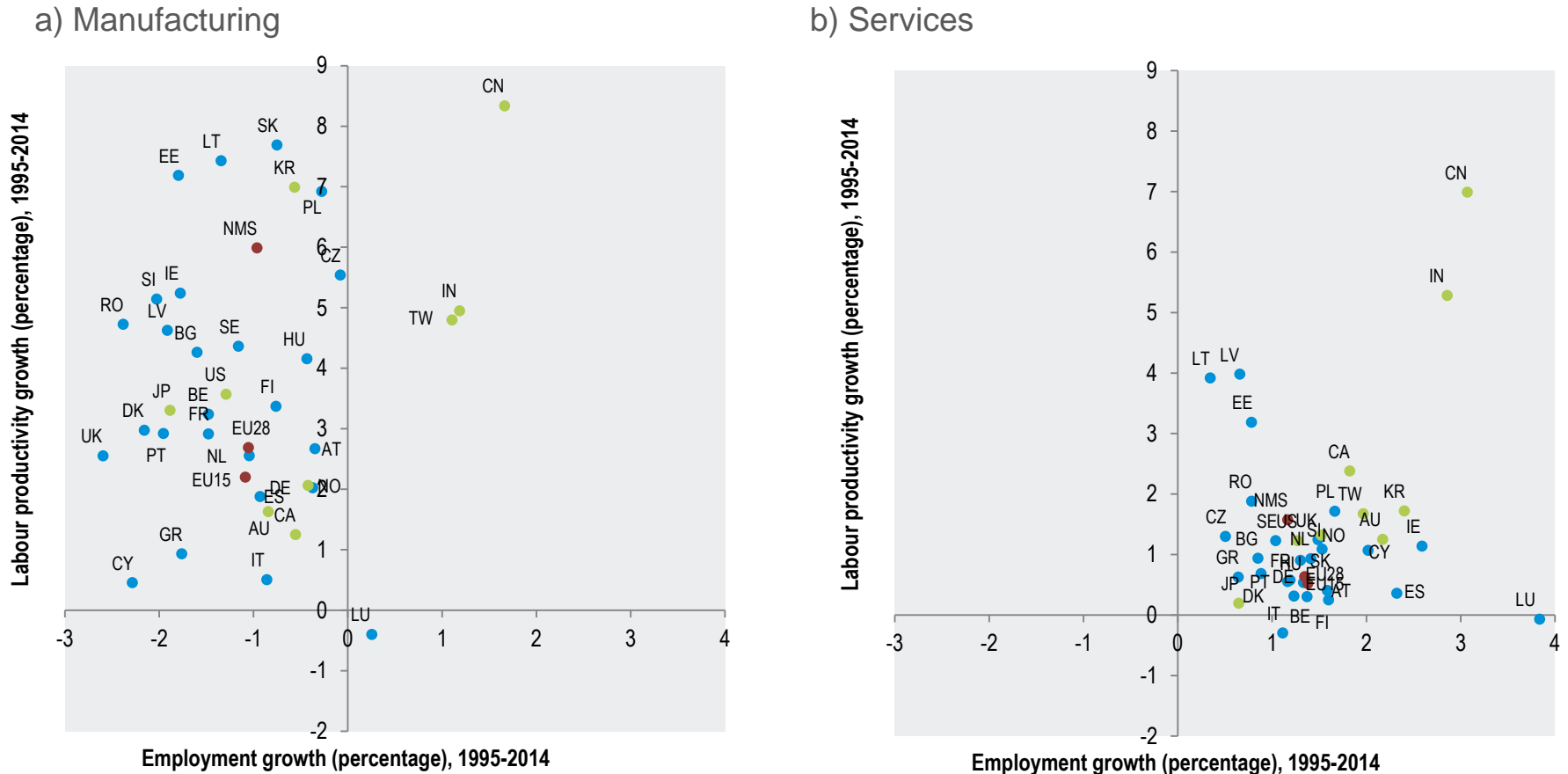


Note: 1995-2013 for Australia, Canada, China, India, Japan, Korea and Taiwan. EU28 and NMS do not include Croatia and Malta.
 Source: ABS, APO, BEA, Canada Statistics, Eurostat, ILO, OECD and own elaboration.

In most countries GVA growth stemmed mainly from labour productivity growth. The EU15 saw how both sources contributed almost equally.

GVA growth: employment and labour productivity contributions: Manufacturing versus Services

Figure. 2: Employment vs. labour productivity growth. EU and non-EU countries, 1995-2014



Note: 1995-2013 for Australia, Canada, China, India, Japan, Korea and Taiwan. EU28 and NMS do not include Croatia and Malta.
 Source: ABS, APO, BEA, Canada Statistics, Eurostat, ILO, OECD and own elaboration.

The Importance of a high level of disaggregation.

PREDICT DATABASE (IPTS, Joint Research Center of the European Commission)

VARIABLES: GVA, Employment, BERD, R&D Personnel and Researchers

PERIOD: 2006 – 2013 so far (by the end of 2016: 1995 – 2014)

COUNTRY COVERAGE:

EU – 28 (aggregate and country data)

NON – EU: US, China, India, Taiwan, Korea, Japan, Norway, Switzerland, Brazil, Australia, Canada

INDUSTRY DISAGGREGATION:

6 ICT Industries (OECD 2007 definition)

12 Non-ICT but highly R&D intensive

Rest: manufacturing and services

PREDICT DATABASE Industry Disaggregation

Industries	NACE Rev. 2
Total Manufacturing	05-33
ICT Manufacturing	
<i>Manufacture of electronic components and boards</i>	261
<i>Manufacture of computers and peripheral equipment</i>	262
<i>Manufacture of communication equipment</i>	263
<i>Manufacture of consumer electronics</i>	264
Non-ICT manufacturing R&D intensive	
<i>Manufacture of chemicals and chemical products</i>	20
<i>Manufacture of pharmaceuticals, medicinal chemical and botanical products</i>	21
<i>Manufacture of machinery and equipment</i>	27-28
<i>Manufacture of motor vehicles, trailers and semi-trailers</i>	29
<i>Manufacture of other transport equipment</i>	30
Other manufacturing	n.e.c.
Total services	45-99
ICT Services	
<i>Telecommunications</i>	61
<i>Computer and related activities</i>	5820, 62, 631, 951
Non-ICT Services R&D intensive	
<i>Transportation and storage</i>	49-53
<i>Information and communication (except ICT services)</i>	58-63
<i>Financial and insurance activities</i>	64-66
<i>Professional, scientific and technical activities</i>	69-75
<i>Administration and support service activities</i>	76-82
<i>Education</i>	85
<i>Human health and social work activities</i>	86-88
Other services	n.e.c.

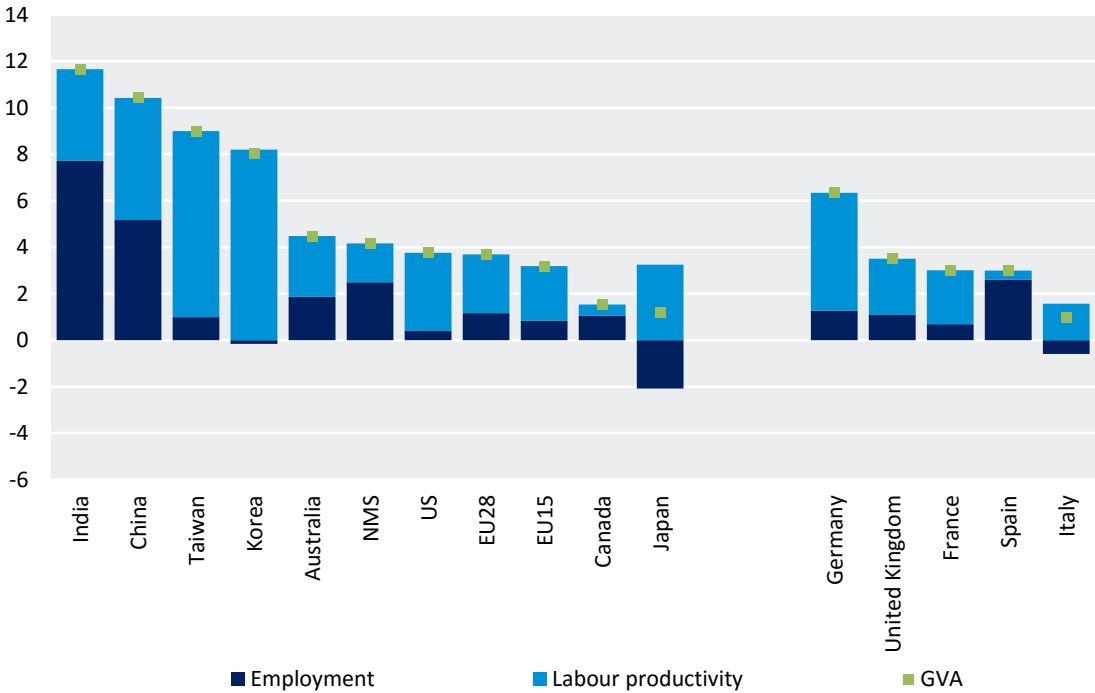
The performance of the ICT sector from the *virtuous* perspective

- Traditionally, the **manufacturing sector** has experienced higher rates of **LP growth** than services.
- Since the ICT revolution this *classical* view has been **challenged**, basically due to the contribution of ICT to:
 - I. economic globalization;
 - II. vertical disintegration of the production process;
 - III. organizational changes within firms

And, **hence**, to **productivity growth**.

On the ICT sector

Figure 4: Employment and labour productivity contributions to GVA growth. ICT sector. EU and non-EU countries, 2006-2013 (percentage)



Note: 2006-2012 for Canada and Japan.
 Source: PREDICT database elaborated by Ivie and JRC-IPTS.

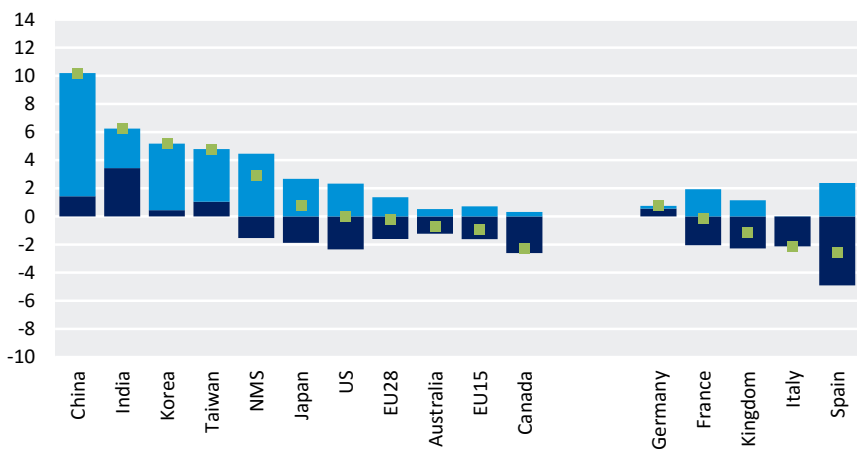
The aggregate ICT sector has shown a *virtuous* behaviour in (almost) all countries.



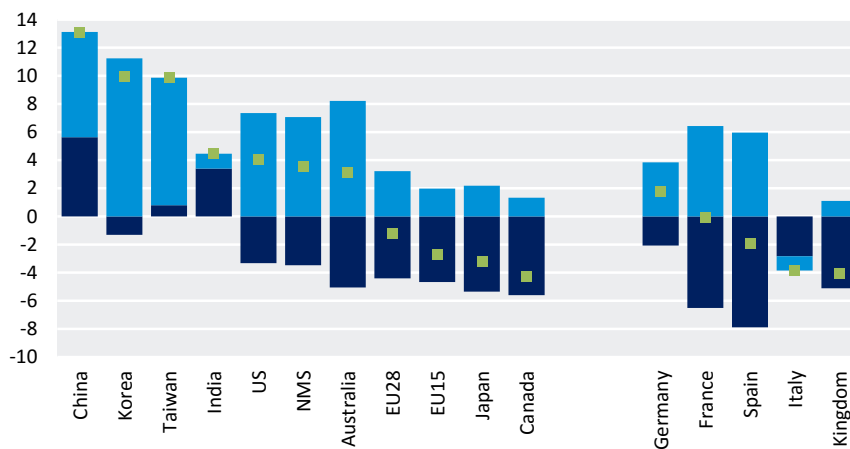
Figure 5: Employment and labour productivity contributions to GVA growth by sub-sector type in EU and non-EU countries, 2006-2013 (percentage)

a) Manufacturing

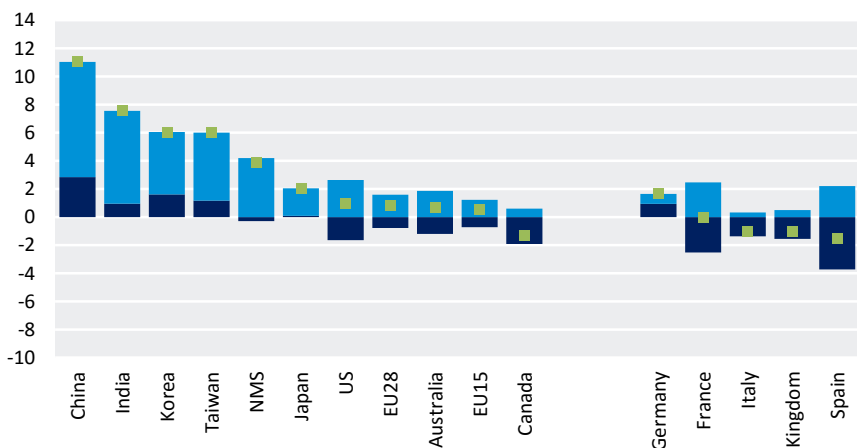
a.1) Total manufacturing



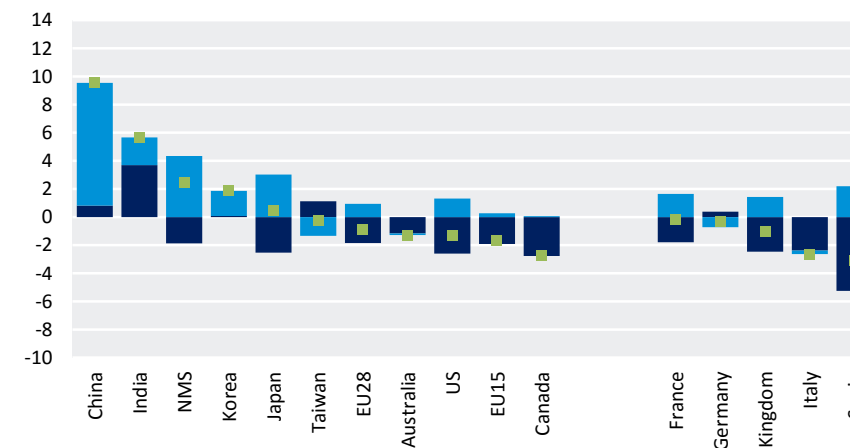
a.2) ICT manufacturing



a.3) Non-ICT manufacturing R&D intensive



a.4) Other manufacturing



■ Employment ■ Labour productivity ■ GVA

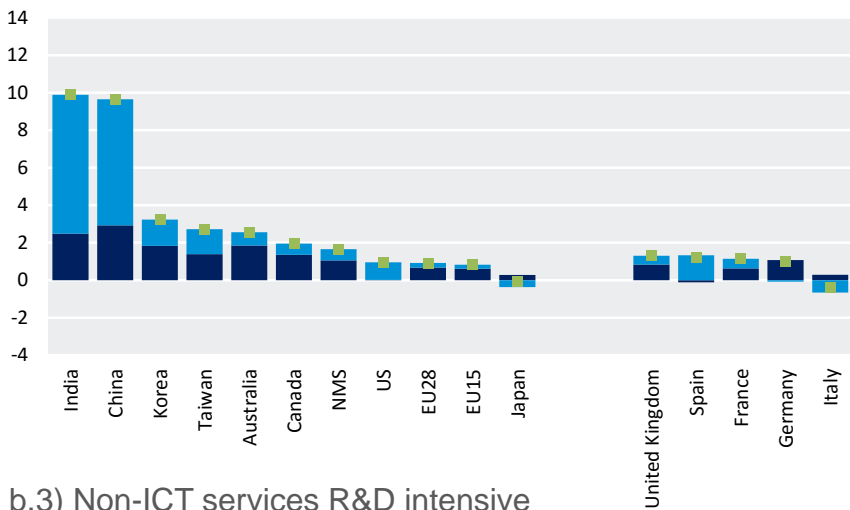
Note: 2006-2012 for Canada and Japan

Source: PREDICT database elaborated by Ivie and JRC-IPTS.

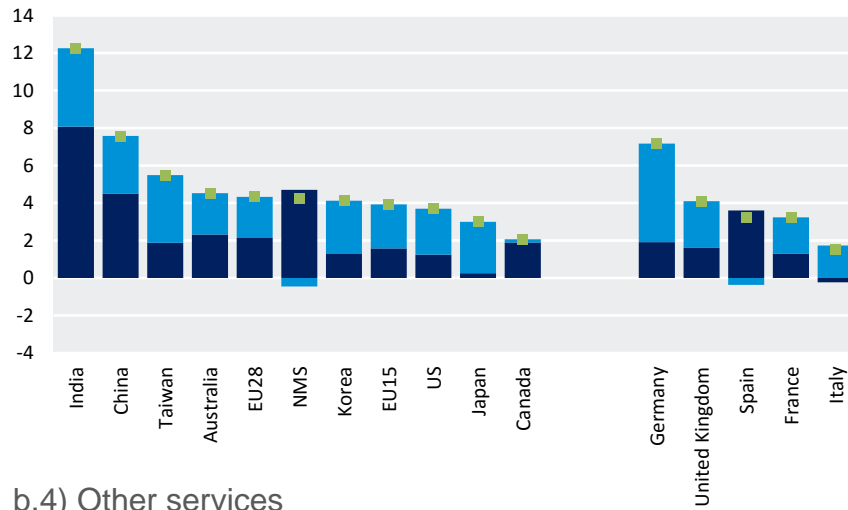
Figure 5 (cont.): Employment and labour productivity contributions to GVA growth by sub-sector type in EU and non-EU countries, 2006-2013 (percentage)

b) Services

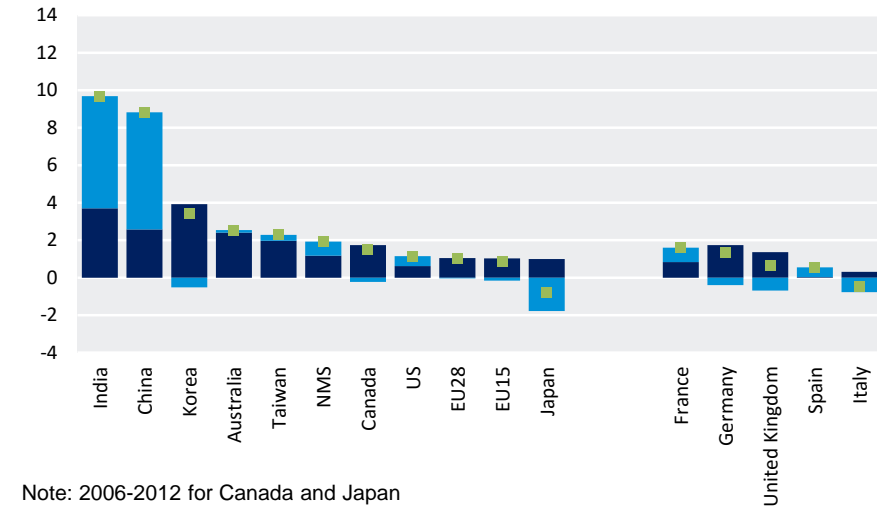
b.1) Total services



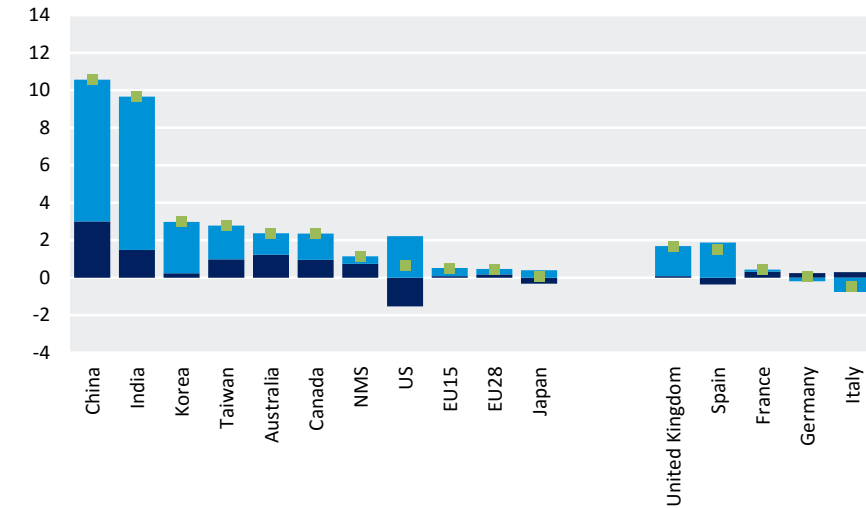
b.2) ICT services



b.3) Non-ICT services R&D intensive



b.4) Other services



Note: 2006-2012 for Canada and Japan

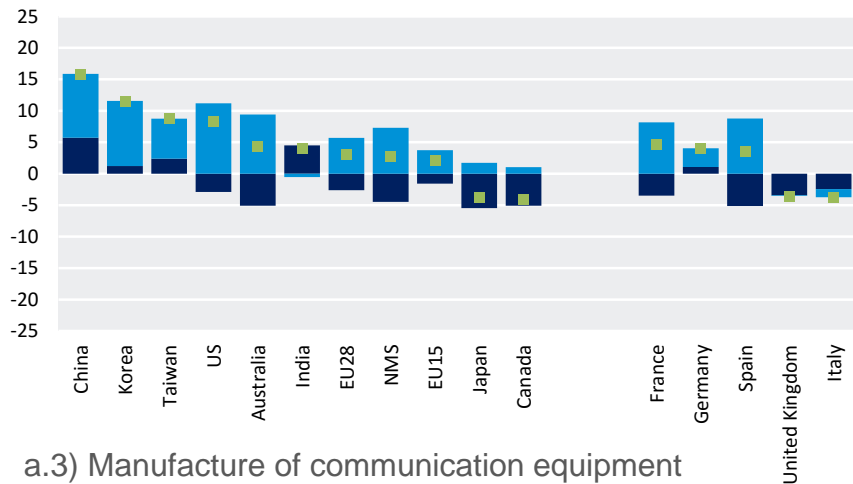
Source: PREDICT database elaborated by Ivie and JRC-IPTS.

■ Employment ■ Labour productivity ■ GVA

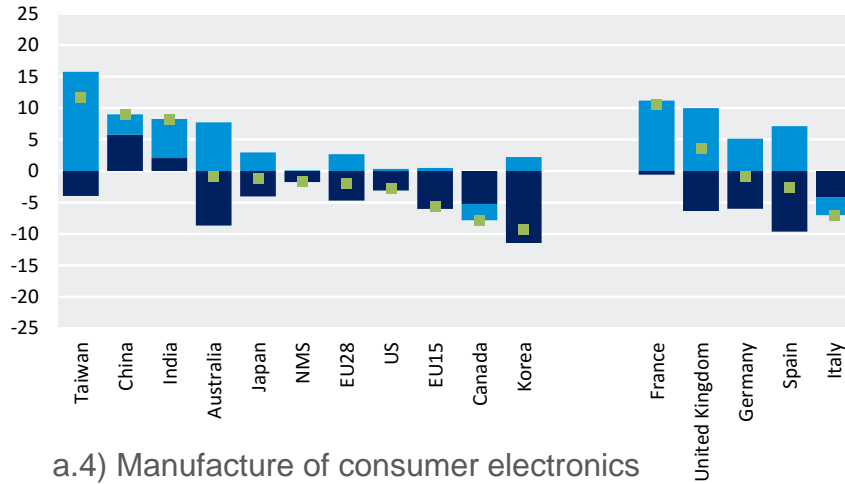
Figure 6: Employment and labour productivity contributions to GVA growth by ICT sub-sector type in EU and non-EU countries, 2006-2013 (percentage)

a) ICT Manufacturing

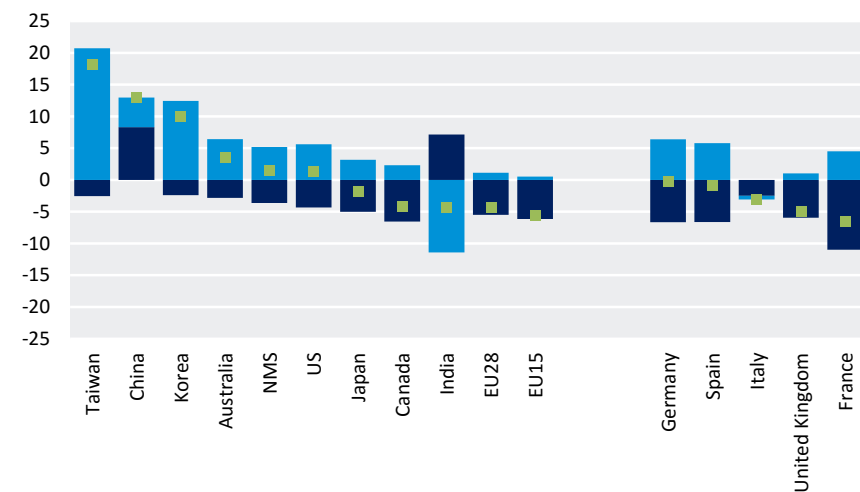
a.1) Manufacture of electronic components and boards (NACE 261)



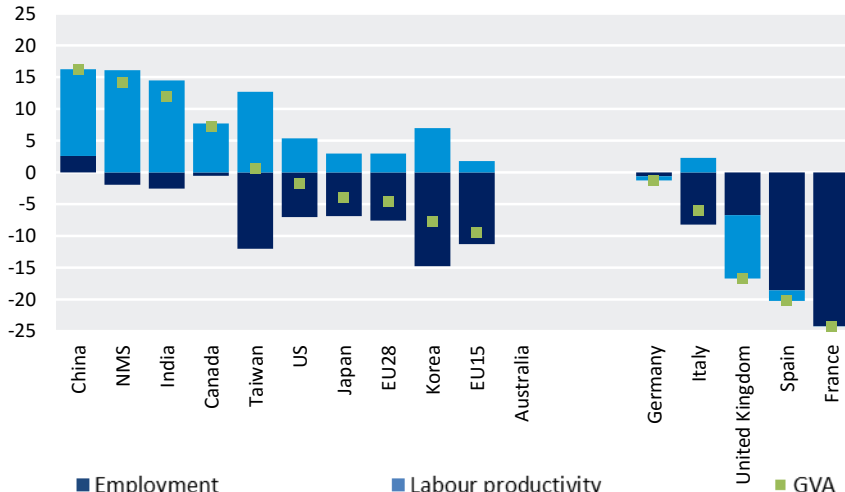
a.2) Manufacture of computers and peripheral equipment (NACE 262)



a.3) Manufacture of communication equipment (NACE 263)



a.4) Manufacture of consumer electronics (NACE 264)



■ Employment ■ Labour productivity ■ GVA

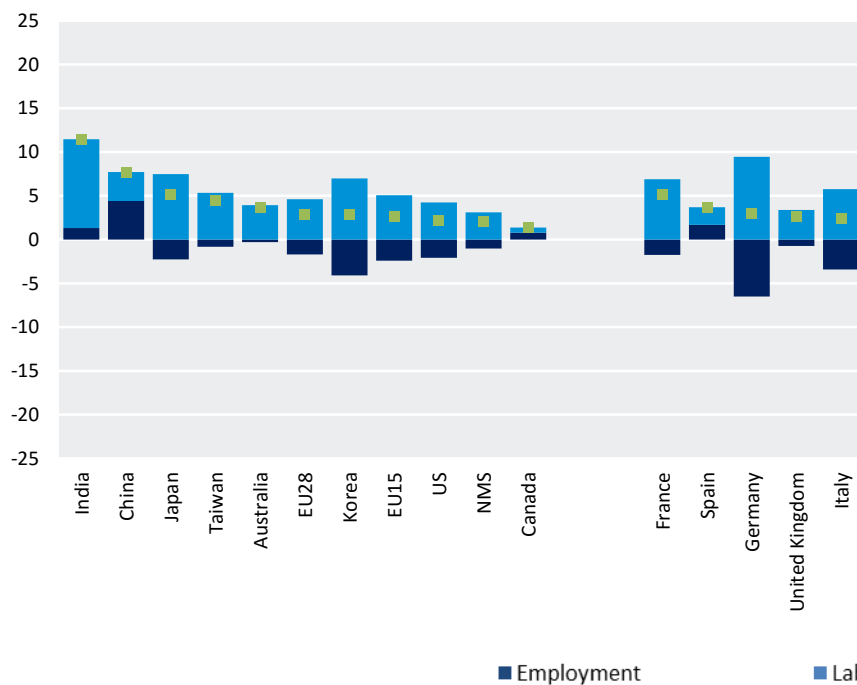
Note: 2006-2012 for Canada and Japan. In the case of Australia, NACE 261 includes Manufacture of consumer electronics (NACE 264) and Manufacture of magnetic and optical media (NACE 268). Source: PREDICT database elaborated by Ivie and JRC-IPTS.



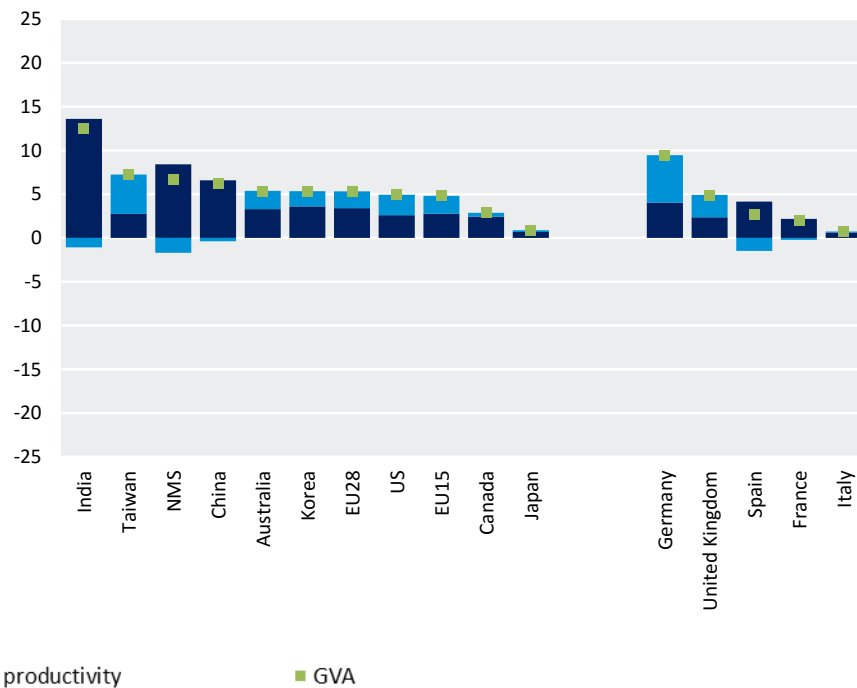
Figure 6 (cont.): Employment and labour productivity contributions to GVA growth by ICT sub-sector type in EU and non-EU countries, 2006-2013 (percentage)

b) ICT Services

b.1) Telecommunications (NACE 61)



b.2) Computer and related activities (NACE 5820, 62, 631, 951)

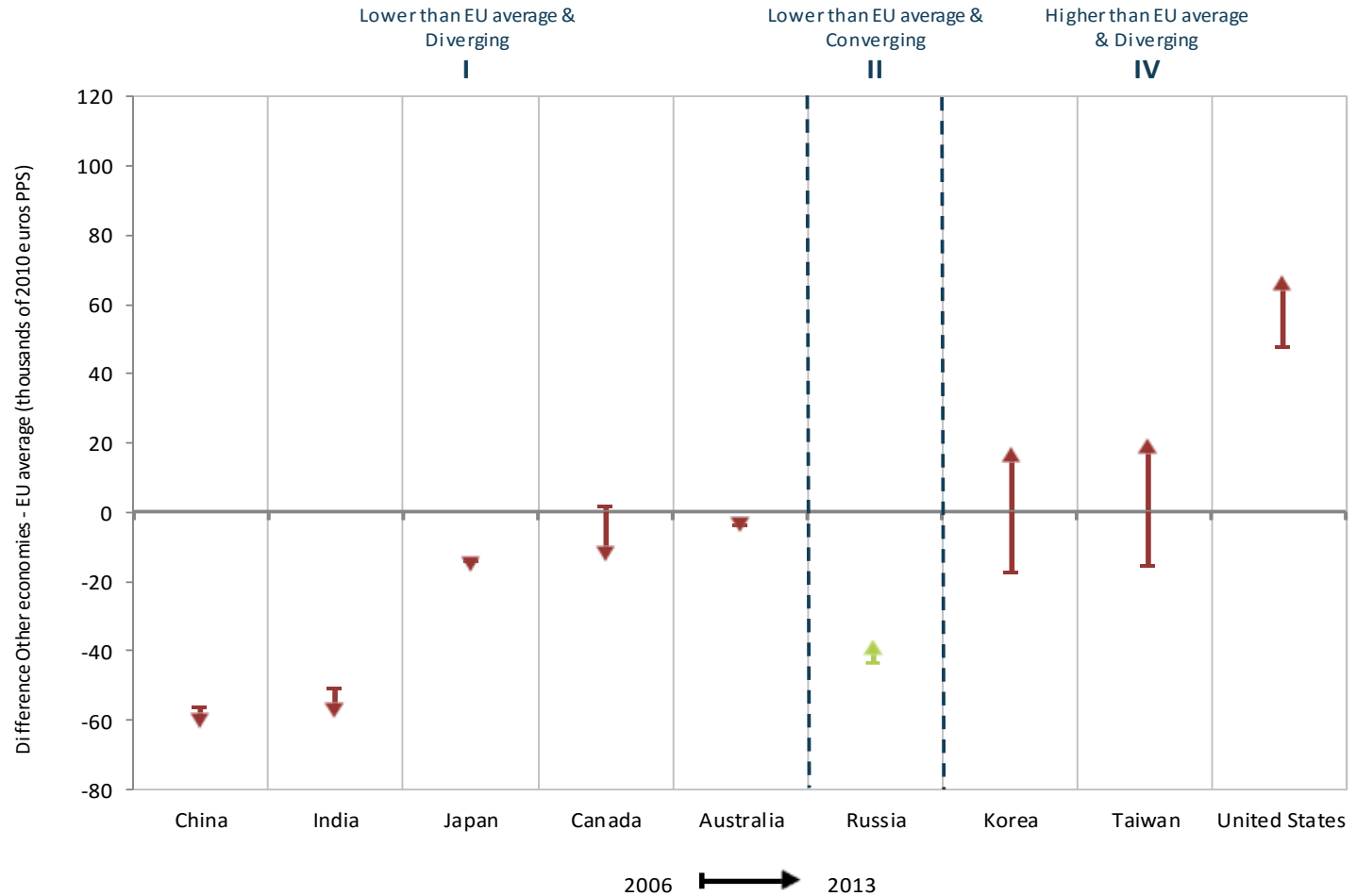


Note: 2006-2012 for Canada and Japan. In the case of Australia, NACE 261 includes Manufacture of consumer electronics (NACE 264) and Manufacture of magnetic and optical media (NACE 268).

Source: PREDICT database elaborated by Ivie and JRC-IPTS.

More on the ICT sector

**Figure 7:
Dynamics of the ICT sector productivity differences of other economies vs. the EU28 average. 2006 and 2013 (Thousands of 2010 Euros PPS)**



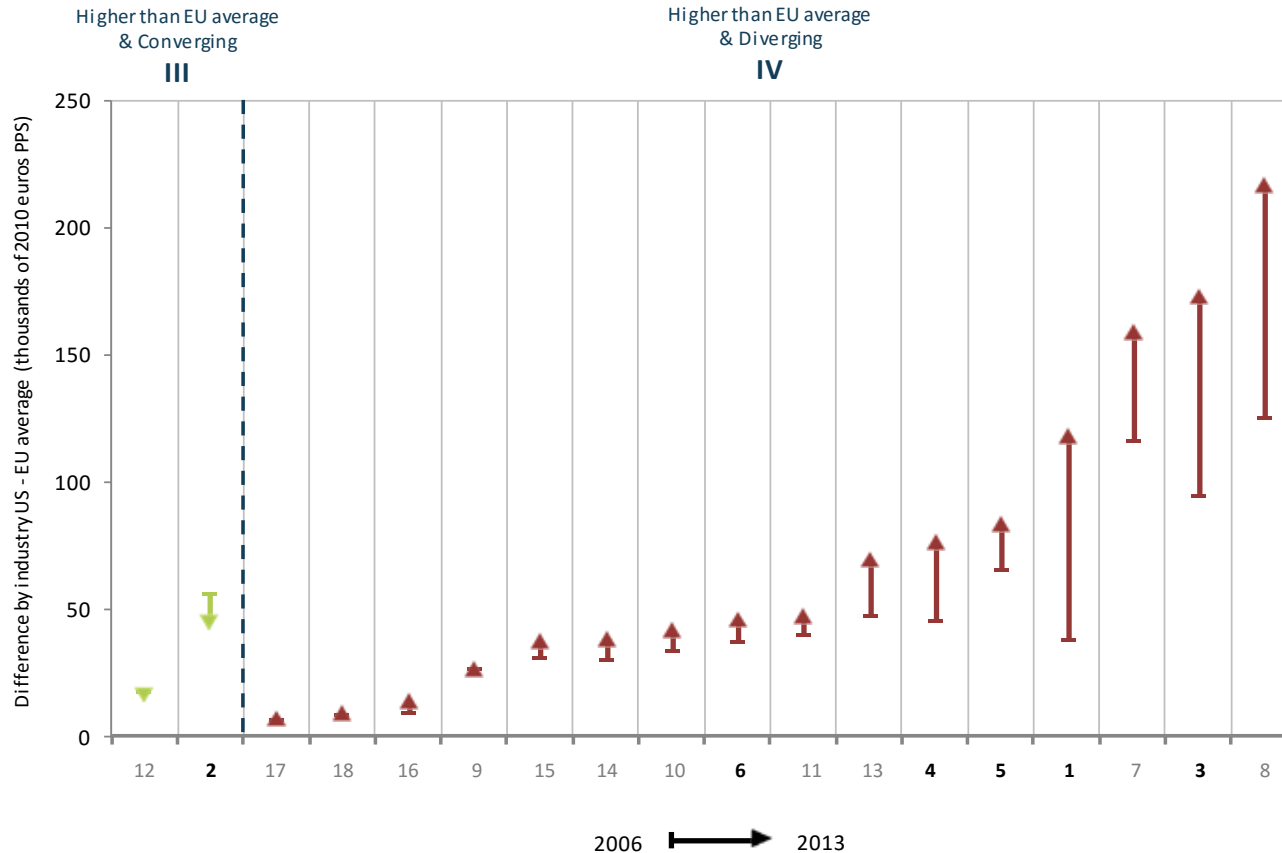
Note: EU28 Labour productivity in 2006 = 82.5; EU28 Labour productivity in 2013 = 98.5. Latest available data for Canada and Japan corresponds to 2012.

Source: PREDICT database elaborated by Ivie and JRC-IPTS

The EU experienced a mixed performance in terms of labour productivity growth in its ICT sector.

More on the ICT and the non-ICT R&D sectors

Figure 8: Dynamics of US-EU28 productivity differences by sub-sector, 2006 and 2013 (Thousands of 2010 Euros PPS)



ICT industries	
1	Manufacture of electronic components and boards [261]
2	Manufacture of computers and peripheral equipment [262]
3	Manufacture of communication equipment [263]
4	Manufacture of consumer electronics [264]
5	Telecommunications [61]
6	Computer and related activities [5820, 62, 631, 951]
Non-ICT industries	
7	Manufacture of chemicals and chemical products [20]
8	Manufacture of pharmaceuticals, medicinal chemical and botanical products [21]
9	Manufacture of machinery and equipment [27-28]
10	Manufacture of motor vehicles, trailers and semi-trailers [29]
11	Manufacture of other transport equipment [30]
12	Transportation and storage [49-53]
13	Information and communication [58-63, except Computer and related activities]
14	Financial and insurance activities [64-63]
15	Professional, scientific and technical activities [69-75]
16	Administration and support service activities [76-82]
17	Education [85]
18	Human health and social work activities [86-88]

Note: ICT sectors marked in bold. The codification of industries can be found in the box to the left (NACE Rev. 2 codes in brackets). Source: PREDICT database elaborated by Ivie and JRC-IPTS

The US has outperformed the EU in all sectors. But its superiority is specially marked in four manufacturing industries: two non-ICT (*Pharmaceuticals and medicinal products* and *Chemical products*) and two ICT (*Manufacture of communication equipment* and *Manufacture of electronic components and boards*)

Concluding Remarks

The EU has (at least) two main problems: 1. High unemployment rates -especially in the peripheral countries such as Spain- and 2. A weak performance in terms of labour productivity growth, which has become more acute in the last few years of the crisis.

From our point of view, the proposed *reindustrialization* is not going to solve them. It can even be a dangerous message if it is interpreted as a rationale for coming back to a renewed protectionism.

ICT have experienced job destruction in almost all countries. The only subsector with positive employment growth is *Computer and related activities*. Generally speaking the *Non-ICT R&D intensive* industries has performed better in terms of our definition of *virtuous* pattern of growth.

For the EU, the disappointing behaviour affects both manufacturing and service activities, ICT and Non-ICT industries. Thus, the target should not be reindustrialization but rather the general improvement in the functioning of the economy in general and, in particular, in terms of both, job creation and productivity growth.

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Looking for a virtuous pattern of growth: Some insights for the discussion

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