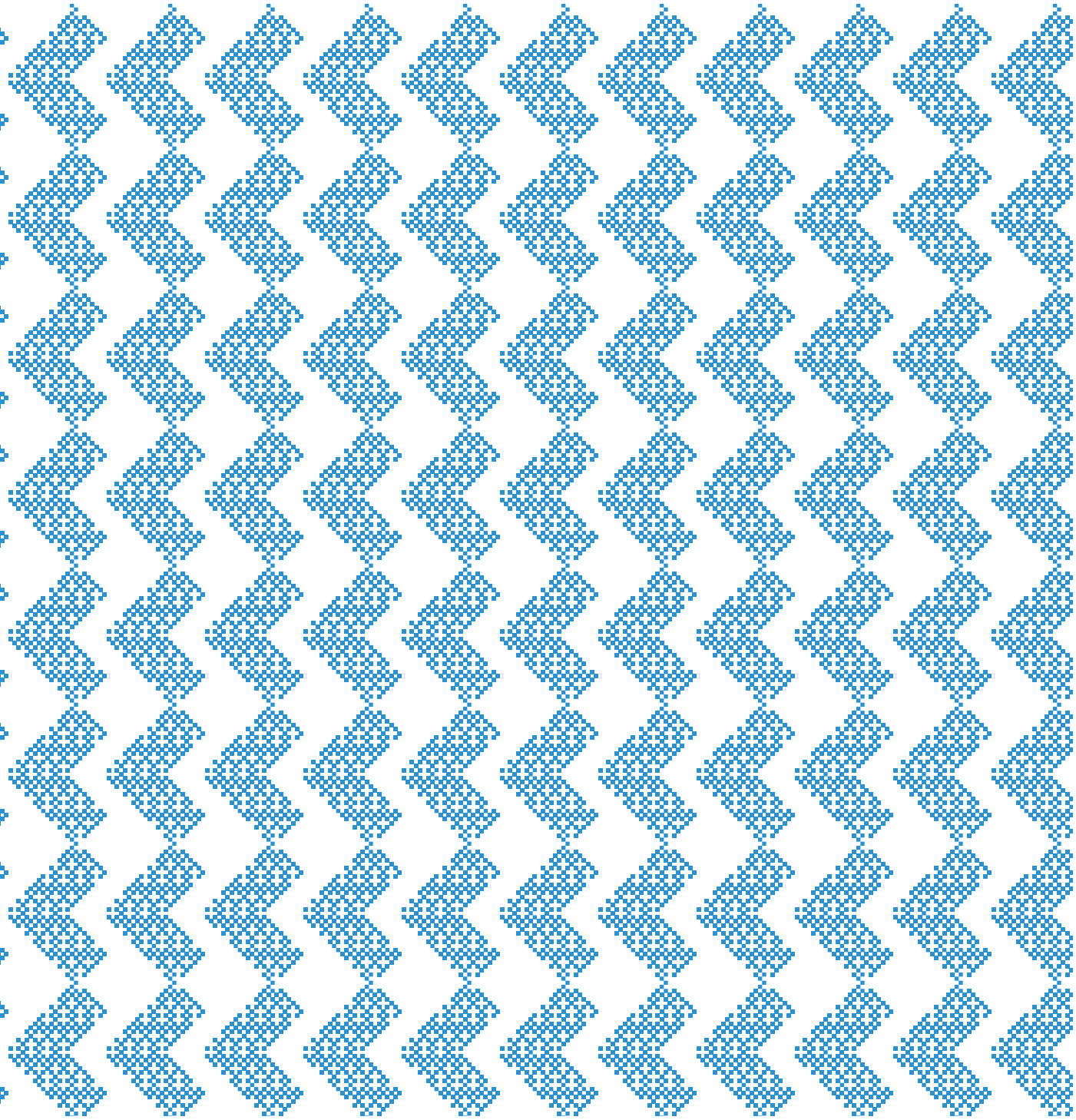
Re-Industrialization Strategy



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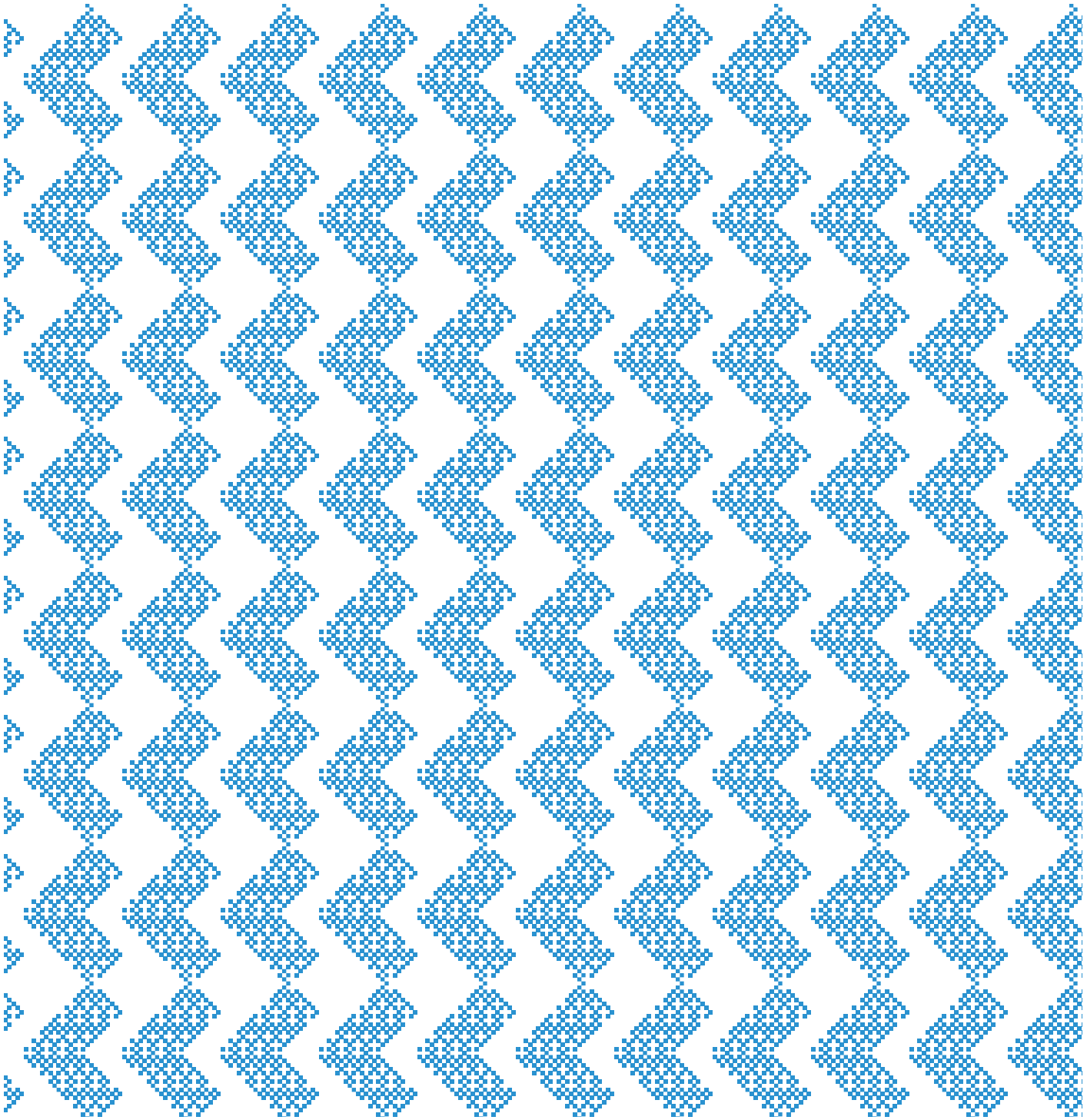

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RE-INDUSTRIALIZATION STRATEGY

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1. The objectives of a re-industrialization strategy

Urgent re-industrialization of our economies is an obvious need and requires to define a strategy that should help us to achieve it. A first and relatively easy to respond question is whether our manufacturing activity should be focused in one of the next three market levels: domestic, European community or global. The answer is obviously negative for our domestic markets, as they are small and open enough that there is no difference from competing in any other country. Neither seems a good target to limit ourselves to the EU market too, as the greatest growth demand is now in those geographical areas where our market share could still grow a lot. The answer to this first question is therefore that any initiative to re-industrialize our countries should be oriented to the world market.

Another question should address the type of products to which our manufacturing industry should be directed. While it is true that countries such as Korea and Finland were able to arise world leading manufacturing sectors from almost scratch, there are many examples showing how difficult is it to guess right the "industrial champions". Criteria to answer this second question would be basically two: the country already existing or reasonably possible manufacturing capabilities for export, and the actual and potential demand currently existing in the international market.

Manufactured goods demand has experienced a continued growth in all types of products, a trend that has been reinforced since the emerging countries started their expansionary phase. Annual average growth rates have even reached the 8% in the period 2005-2011 despite the crisis. These rates have always been positive and show variations within products family, e.g., products whose demand growth was lower in this period are office equipment and telecommunications with a rate of around 5% per year, while chemical products grew at a 10%. It seems any way that if export could not be accomplished, the responsibility was not in the lack of an international demand.

Moreover, the strategy should have the complicity of those new sectors emerging from modern applications of knowledge, but should also involve traditional industry sectors whose survival would be largely reinforced with a renewal that would involve the full innovation process, which obviously includes from the initial steps of ideas generation until they are put into practice either by placing goods in the market or improving the efficiency of processes.

Taking innovation as one of the cornerstones of this re-industrialization strategy will require measures to facilitate the involvement of the different actors of the innovation system, both at the state and at the regional levels, as well as the collaboration among them. The three southern European countries especially need to improve the processes of collaboration among their different regions, a requirement also essential to the efficiency and success of the measures to be taken by the public sector directed to facilitate re-industrialization process.

The strategy should take into account that new industrial companies will be mostly small and medium enterprises (SMEs), which together with the current SMEs constitute 99.9% of

companies in Italy, Portugal and Spain fabrics. To enhance modernization will be a need to the already existing enterprises, which should also be induced to rethink their business culture towards visions reinforcing their sustainable value creation, their investment in innovation, their international focus, etc.

Another goal of the re-industrialization strategy is to attract the financial system to pay attention to the wide variety of business required by a solid industrial fabric.

2. Main features of a manufacturing sector

Basic features of large aggregates in the manufacturing sector (NACE two-digit breakdown) are presented in this section, analyzed under a global perspective. At this level of description, specific features will not be perceived at both country level and sub-sectors of each sectorial aggregate.

Sector aggregates analyzed are:

- Food products; beverages and tobacco
- Textiles, wearing apparel, leather
- Wood, paper and printing
- Coke and refined petroleum products
- Chemical, incl. Pharma
- Rubber and plastics
- Other non-metallic mineral products
- Basic metals
- Metal products, except machinery and equipment
- Computer, electronic and optical products
- Electrical equipment
- Machinery and equipment n.e.c.
- Motor vehicles
- Other transport equipment
- Other manufacturing

Variables used to analyze each aggregate are:

- Apparent productivity of labour: Measured as value added per worked hour
- Return on capital: Measured as a percentage of value added to gross operating surplus
- Energy efficiency: Measured as value added generated per unit of energy consumed
- R&D intensity: Expenditure on R&D relative to the value added generated
- Export intensity: Measured as value of exports relative to value added generated.

2.1 Production factors

Productivity of production factors sensitively depends on the aggregate sector considered, although the range of variation is significantly lower among manufacturing sectors than in the total economy. While in European countries it is not uncommon to find differences in the

apparent productivity of labor across sectors in a range of twenty to one, this range is reduced to eight to one for the global manufacturing industry as a whole, and it could be only 2.5 to one if the two aggregates with less intensity of labor factor are excluded: Coke and refined petroleum products, and Chemical (inc.Pharma). Moreover, the range of variation of return on capital (value added to gross operating surplus) is only one and a half times if excluded the two aggregates just mentioned.

Figure 1 shows the apparent productivity of labour (dollars per hour worked) of global industry groups in 2007. The maximum of about $170 was held by Coke and refined petroleum products, followed by Chemical with around $100, and Motor vehicles and Basic metals, with approximately $75, corresponding the minimum with around $30 to Textiles, wearing apparel and leather, wood, and other manufacturing (toys, furniture, jewelry, etc..).

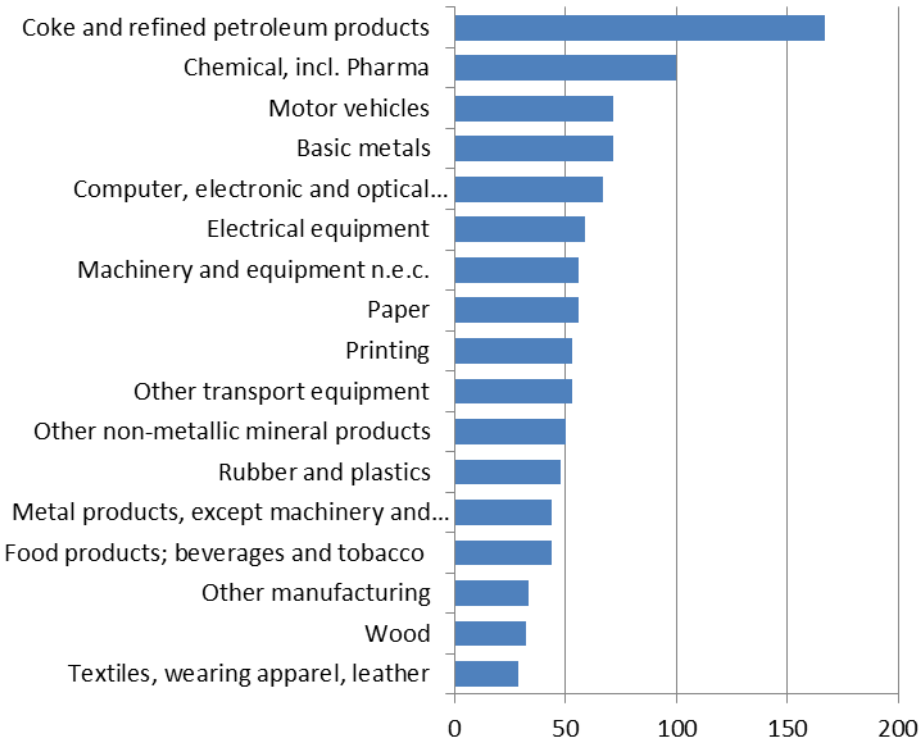


Figure 1. Apparent productivity of labour

Capital contribution measured as a percentage of value added to gross operating surplus can be seen for different industry clusters in Figure 2. As it could be expected, higher rates can be observed in the aggregates with higher apparent productivity (Coke and refined petroleum products, Chemical). However, the weight of this factor bears no strict correlation with the apparent productivity for other sectorial groups. Thus and as an example, sectorial aggregate of Wood was the eighth with higher capital contribution, though it was the second less

productive, and Food, beverages and tobacco aggregate showed to be the fourth less productive while showing the fifth highest contribution of capital.

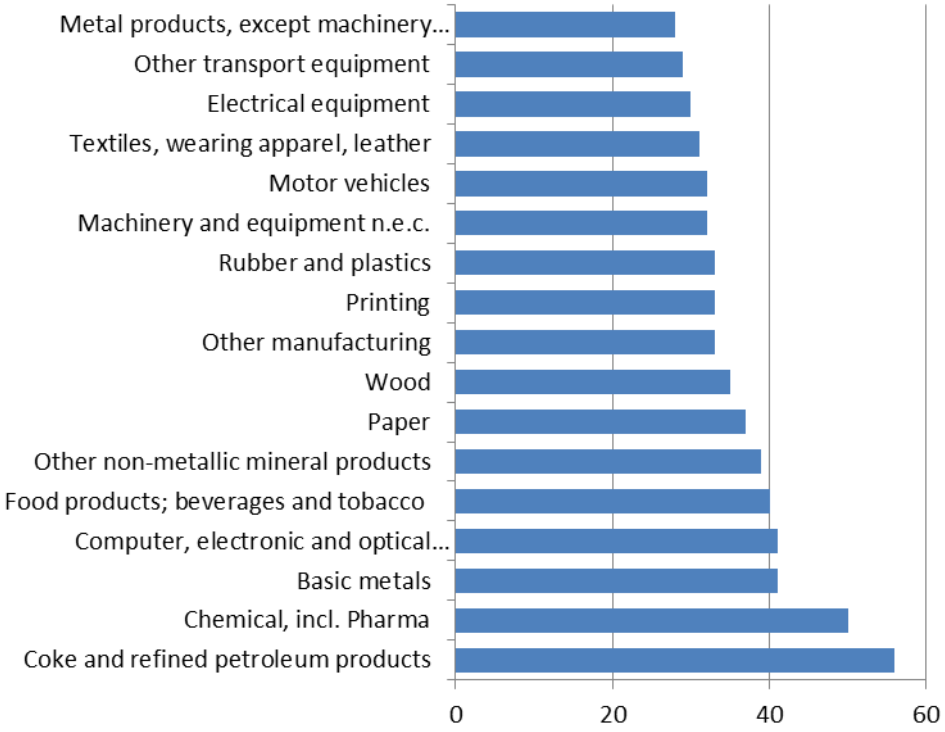


Figure 2. Contribution of capital to GVA

To interpret these data, it should be kept in mind that these are aggregate figures for the entire world production as this would masks the large differences that might happen in sectors among different countries.

It is however possible to use these global data to make a first taxonomy of sectorial industry aggregates based on their apparent productivity and the contribution of capital to GVA to estimate their weight in the manufacturing sector GVA in the countries of interest. To produce this estimate based on the apparent productivity of labour, the seventeen aggregates considered have been gathered in four groups as follows.

Group 1: More than $70 per worked hour

- Coke and refined petroleum products
- Chemical, incl. Pharma
- Basic metals
- Motor vehicles
- Computer, electronic and optical products

Group 2: Between $50 and $70 per worked hour

- Electrical equipment
- Paper
- Machinery and equipment n.e.c
- Printing
- Other transport equipment

Group 3: Between $35 and $50 per worked hour

- Other non-metallic mineral products
- Rubber and plastics
- Metal products (except machinery and equipment)
- Food products, beverages and tobacco

Group 4: Less than $35 per worked hour

- Other manufacturing
- Wood
- Textiles, wearing apparel, leather

Figure 3 shows the weight of each one of these four groups in the industrial GVA of Italy, Portugal and Spain, together with that of Germany, France, United Kingdom, and the average of the EU27 used as a reference.

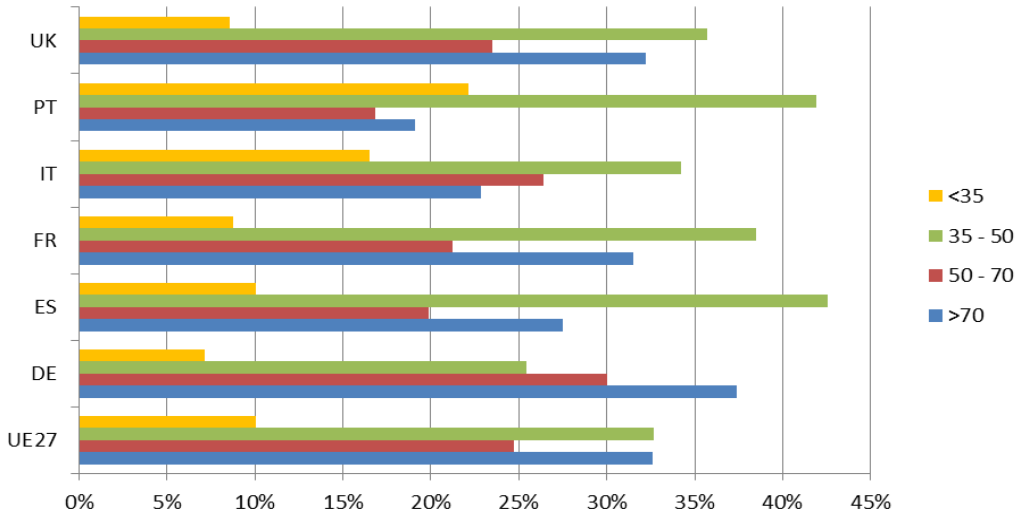


Figure 3. Contribution to industrial GVA based on the apparent productivity (dollars per worked hour)

In this figure, it can be observed that for a majority of countries the group of $35 to $50 per hour is the one contributing more to industrial GVA. Germany is an exception as the weight of each sector in total industrial GVA increases with the growth in productivity. For all countries except Portugal, the groups with lower productivity are the ones contributing less to total industrial GVA.

Appraisal of the weight of each sector in the industrial GVA as a function of capital contribution has been performed through a concentration of the seventeen aggregates in the following three groups:

Group 1: Gross operating surplus between 28% and 35% of GVA

- Metal products (except machinery and equipment)
- Other transport equipment
- Electrical equipment
- Textiles, wearing apparel, leather
- Motor vehicles
- Machinery and equipment n.e.c
- Printing
- Rubber and plastics
- Other manufacturing
- Wood

Group 2: Gross operating surplus between 37% and 41% of GVA

- Paper
- Other non-metallic mineral products
- Food products, beverages and tobacco
- Basic metals
- Computer, electronic and optical products

Group 3: Gross operating surplus between 50% and 56% of GVA

- Chemical, including pharmacy
- Coke and refined petroleum products

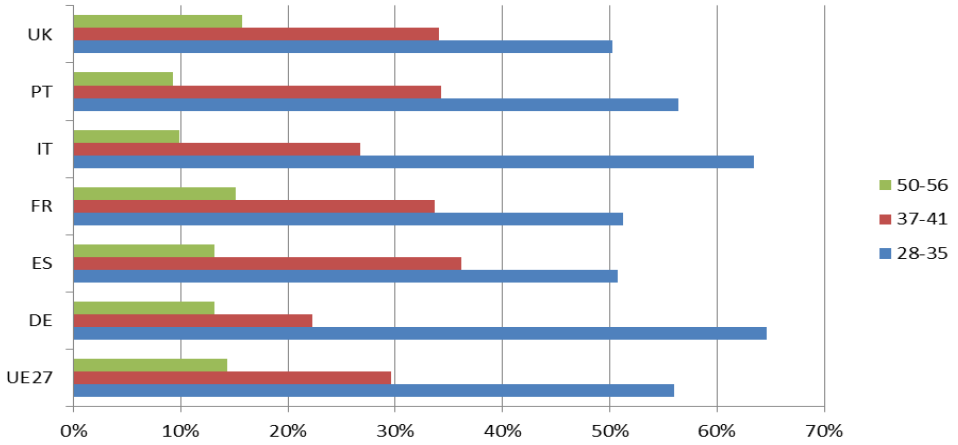


Figure 4. Contribution to industrial GVA as contribution of capital to GVA (percentage of GVA assigned to gross operating surplus)

Figure 4 shows the weight of each of the three groups in the industrial GVA of Italy, Portugal and Spain, together with the same data for Germany, France, United Kingdom and the EU27 used as a reference.

It is observed that distribution pattern of this weight per groups is similar for all countries considered though there are slight variations in the relative weights. In the case of Germany and Italy the groups with a lower contribution of capital to GVA have the greater weight among all countries.

2.2 Energy efficiency

There is also a great diversity in the energy efficiency of the various manufacturing sectors, as shown in Figure 5. Computer, electronic and optical products, Other manufacturing and Other transport equipment aggregates stand out for their greater efficiency, followed by Motor vehicles, Machinery and equipment n.e.c and Electrical equipment sectors, while the least efficient sectors are Basic metals, Other nonmetallic mineral products, Paper and Coke and refined petroleum products.

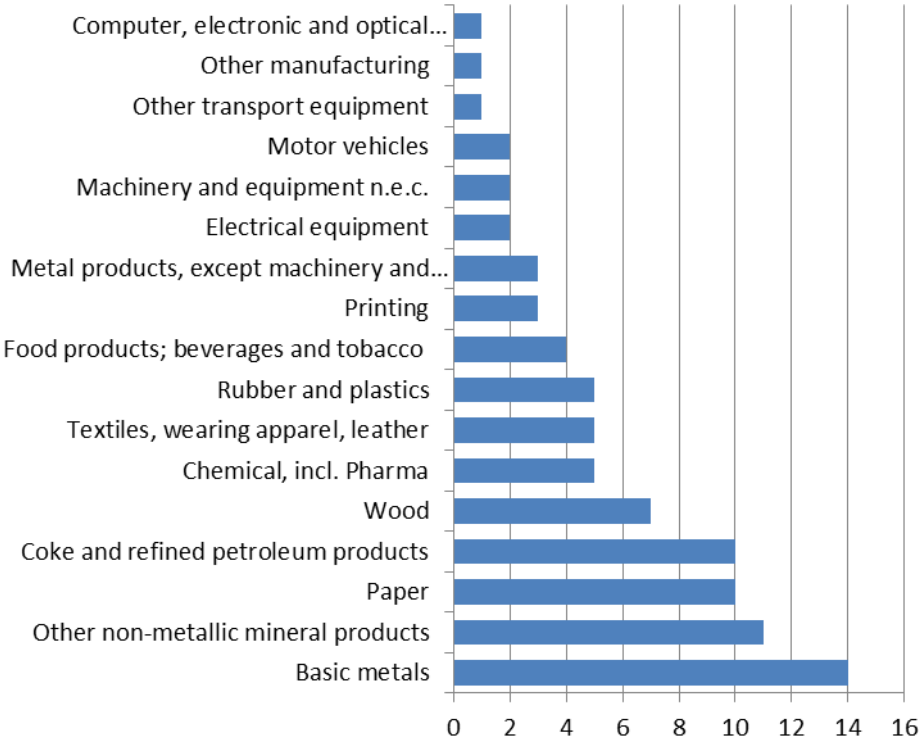


Figure 5. Cost of energy consumed as a percentage of generated GVA

It can be observed a wide range of energy costs variation in each sectorial aggregate, as they can absorb from 1% to 14% of GVA generated. In any re-industrialization strategy to be performed nowadays, this feature should be highly taken into account due to the current strong growth of energy costs. Figure 6 shows the weight of sectors in total industrial GVA

according to their energy efficiency in different countries. Sectorial aggregates have been concentrated in three groups to create this figure:

Group 1: Energy expense between 10% and 14% of GVA

- Coke and refined petroleum products
- Paper
- Other non-metallic mineral products
- Basic metals

Group 2: Energy expense between 3% and 7% of GVA

- Metal products (except machinery and equipment)
- Printing
- Food products, beverages and tobacco
- Textiles, wearing apparel, leather
- Rubber and plastic
- Chemicals, including pharmacy
- Wood

Group 3: Energy expense between 1% and 2% of GVA

- Other manufacturing
- Other transport equipment
- Computer, electronic and optical products
- Electrical equipment
- Machinery and equipment n.e.c.
- Motor vehicles

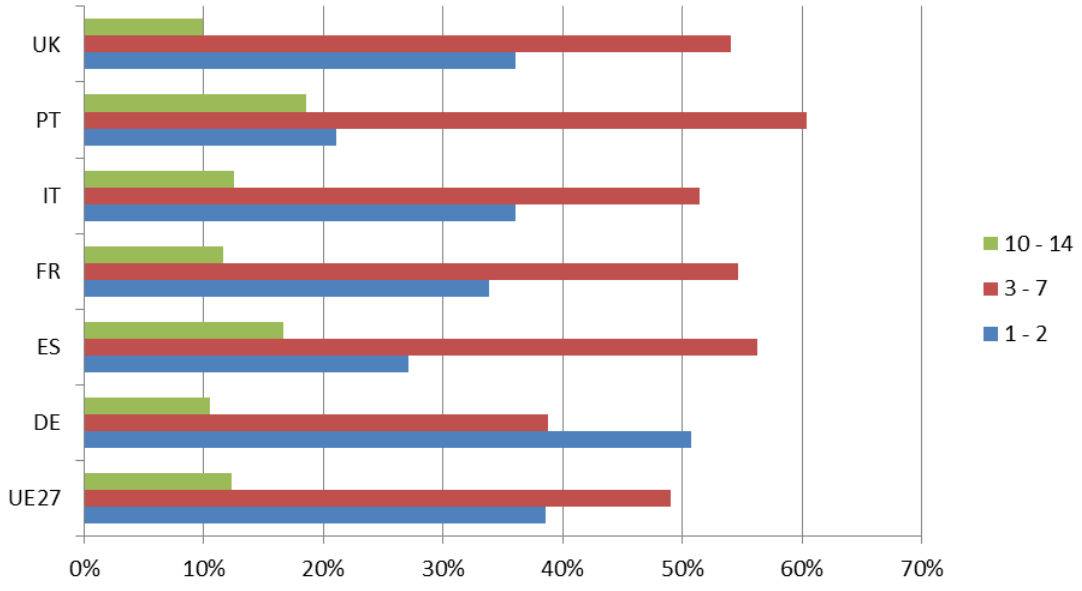


Figure 6. Contribution to GVA as a percentage of GVA of consumed energy

With the exception of Germany, it is observed that all other countries show a similar pattern where the group of intermediate efficiency show the highest weight. Germany however concentrates more than 50% of its industrial GVA in the most energetically efficient sectors (figure 6).

2.3 R&D relevance

Within the manufacturing sector, R&D expense is highly aggregate dependent, as it is shown in figure 7 where it is observed that percentage of GVA assigned to R&D varies from 1% in aggregates of Metal products, except machinery and equipment, Basic metals, Coke and refined petroleum products and Wood, to up to 25% in those dedicated to Computer, electronic and optical products, Other transportation equipment and Chemicals (inc. Pharma). This wide spread is not observed in any of the other features studied.

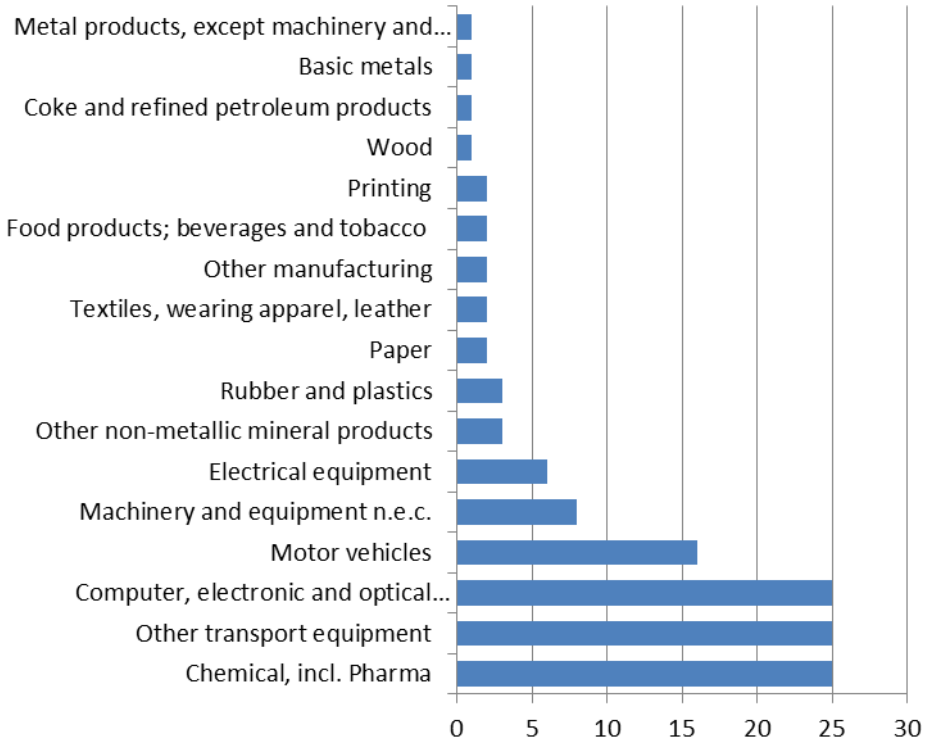


Figure 7. R&D intensity of manufacturing sectors

It is clearly shown that there are manufacturing aggregates with strategies based on research and development as they dedicate to these activities up to a quarter of the value they generate. There are however other sectors for which this activity is merely testimonial as they can support their strategy on public knowledge and sustain their competitiveness in other type of factors. Finally, there are aggregates that lie in between the two extremes, where companies with R&D strategies providing them real competitive advantages can be found (figure 7).

As done previously, the importance of R&D intensity expressed through its weight in industrial GVA has been estimated by concentrating the seventeen studied aggregates in four groups:

Group 1: R&D expense from 0% to 1% of GVA

- Metal products (except machinery and equipment)
- Wood
- Basic metals
- Coke and refined petroleum products

Group 2: R&D expense from 2% to 3% of GVA

- Textiles, wearing apparel, leather
- Printing
- Other manufacturing
- Paper
- Food products, beverages and tobacco
- Rubber and plastic
- Other non-metallic mineral products

Group 3: R&D expense from 6% to 16% of GVA

- Electrical equipment
- Machinery and equipment n.e.c
- Motor vehicles

Group 4: R&D expense of 25% of GVA

- Other transport equipment
- Computer, electronic and optical products
- Chemicals, including pharmacy

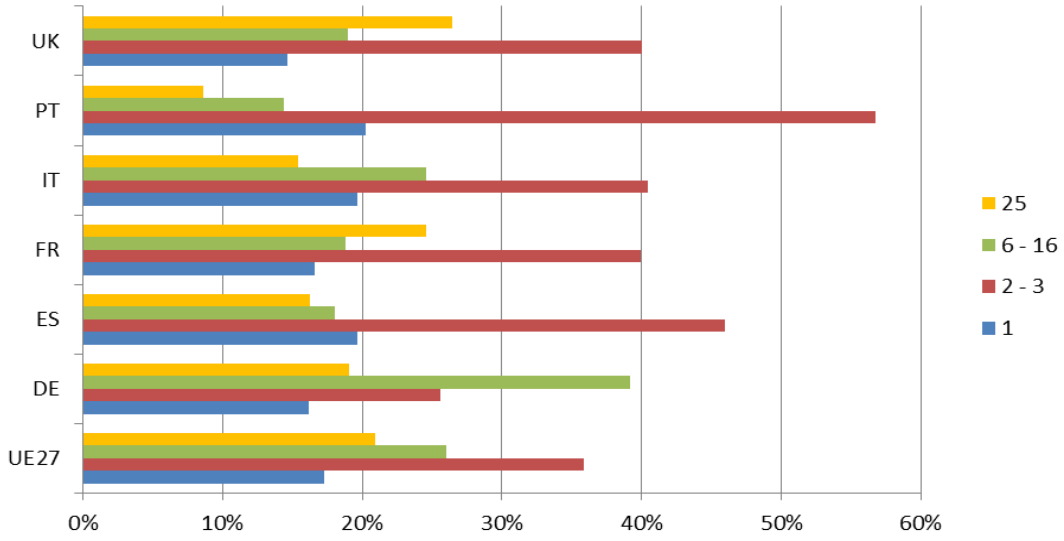


Figure 8. Contribution to GVA per R&D intensity (percentage of GVA expended in R&D)

The weight of R&D expense in the industrial GVA of each group in the studied countries is shown in figure 8. It can be seen that in all European countries studied except in Germany, sectors with R&D intensity between 2% and 3% are those with clearly greater weight in their industrial GVA. Aggregates with the highest R&D intensity stand out in the UK and France, while in Germany nearly 40% of GVA is contributed by sectors with R&D intensities between 6% and 16%. With differences in the relative figures, the pattern in Italy, Portugal and Spain is similar to the average of the European Union of 27.

2.4 Export intensity

Those figures supporting this analysis refer to the global manufacturing sector, which means that each sectorial aggregate adds the data from all countries considered. Thus, when discussing the different features of a particular aggregate, such as R&D needs or export intensity, they are not referred to a particular country since R&D could be performed in a country, production in another one and export could be done in any other country different than the home of production.

Considering this explanation, it can be understood that figure 9 shows the percentage of total production dedicated to export for each sectorial aggregate.

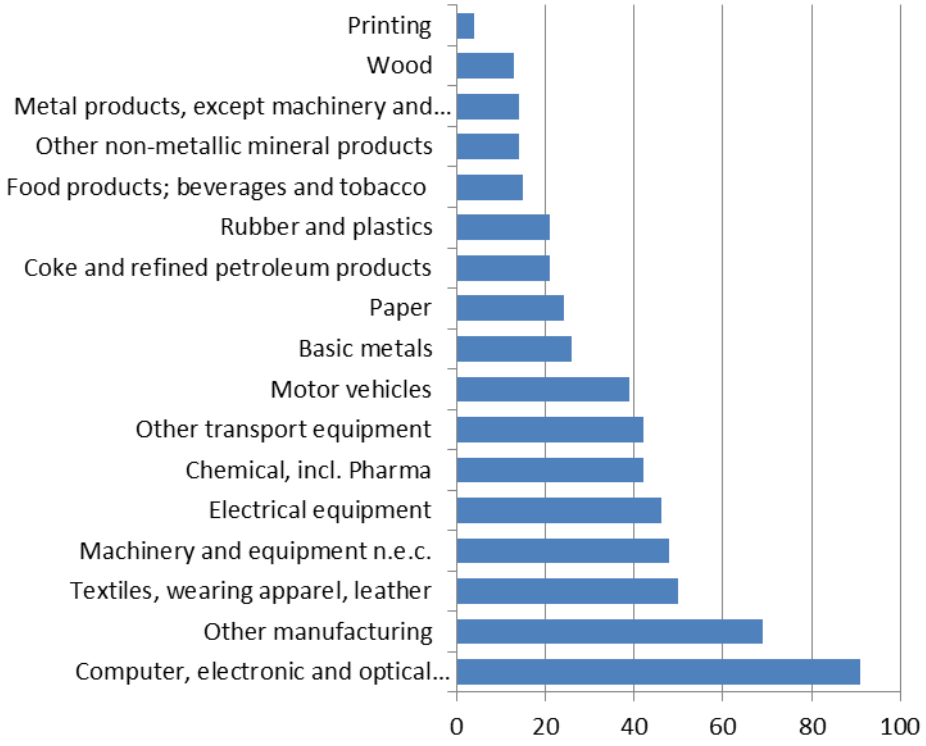


Figure 9. Percentage of production dedicated to export

The rate of production which is intended for countries other than those where it is performed may vary between 90% of Computer, electronic and optical products to 1% of Printing. In addition to the aforementioned Computer products, the highest export rates are in Other manufacturing (toys, furniture, jewelry, etc..) and in Textiles, wearing apparel and leather, exceeding 50%. About 40% is assigned to export in aggregates such as Motor vehicles, Other transport equipment, Chemicals and Machinery and equipment n.e.c.

To assess the contribution to industrial GVA of the various sectorial aggregates in the selected countries based on their export intensity, a concentration in four groups has been performed:

Group 1: Exports of 0% to 15% of production

- Printing
- Wood
- Other non-metallic mineral products
- Metal products (except machinery and equipment)
- Food products, beverages and tobacco

Group 2: Exports of 15% to 30% of production

- Coke and refined petroleum products
- Rubber and plastic
- Paper
- Basic metals

Group 3: Exports of 30% to 50% of production

- Motor vehicles
- Chemical, incl. Pharma
- Other transport equipment
- Electrical equipment
- Machinery and equipment n.e.c

Group 4: Exports higher than 50% of production

- Textiles, wearing apparel, leather
- Other manufacturing
- Computer, electronic and optical products

Contribution to industrial GVA in countries considered here is mainly concentrated in the sectorial aggregates exporting less and in those exporting between 30% and 50% of their production. Again, Germany shows a different pattern to the others because its sectors exporting less are clearly the least contributing to its industrial GVA (less than 25%), while sector aggregates that export between 30% and 50% of their production contribute with nearly 55% to industrial GVA. The countries where sector aggregates with higher export intensity are the ones contributing more to GVA are Portugal, Italy and United Kingdom, in this order (figure 10).

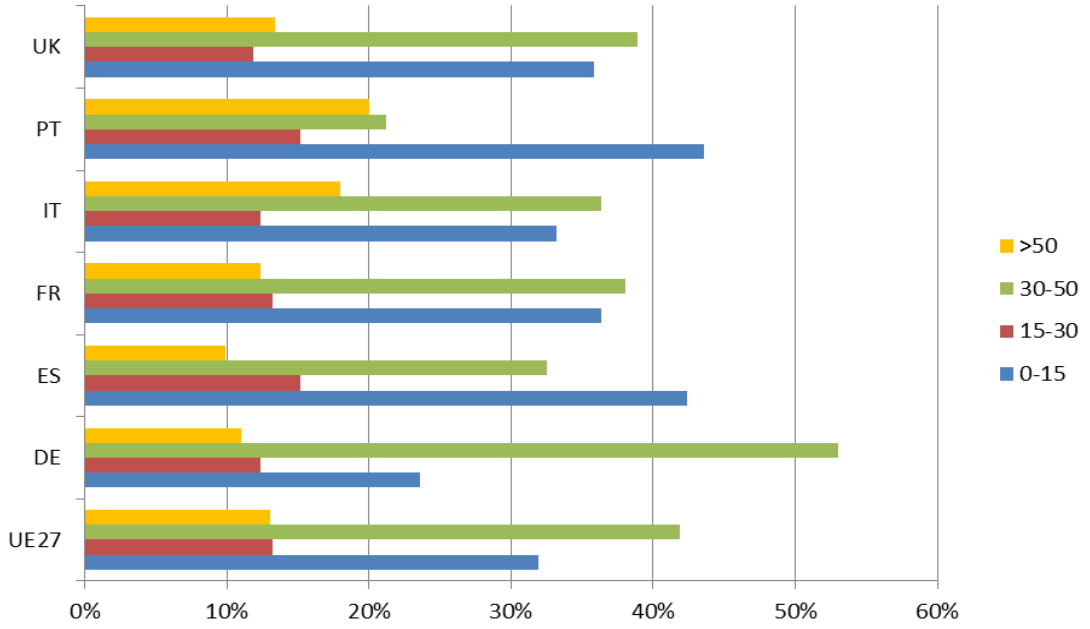


Figure 10. Contribution to GVA as percentage of production dedicated to exports

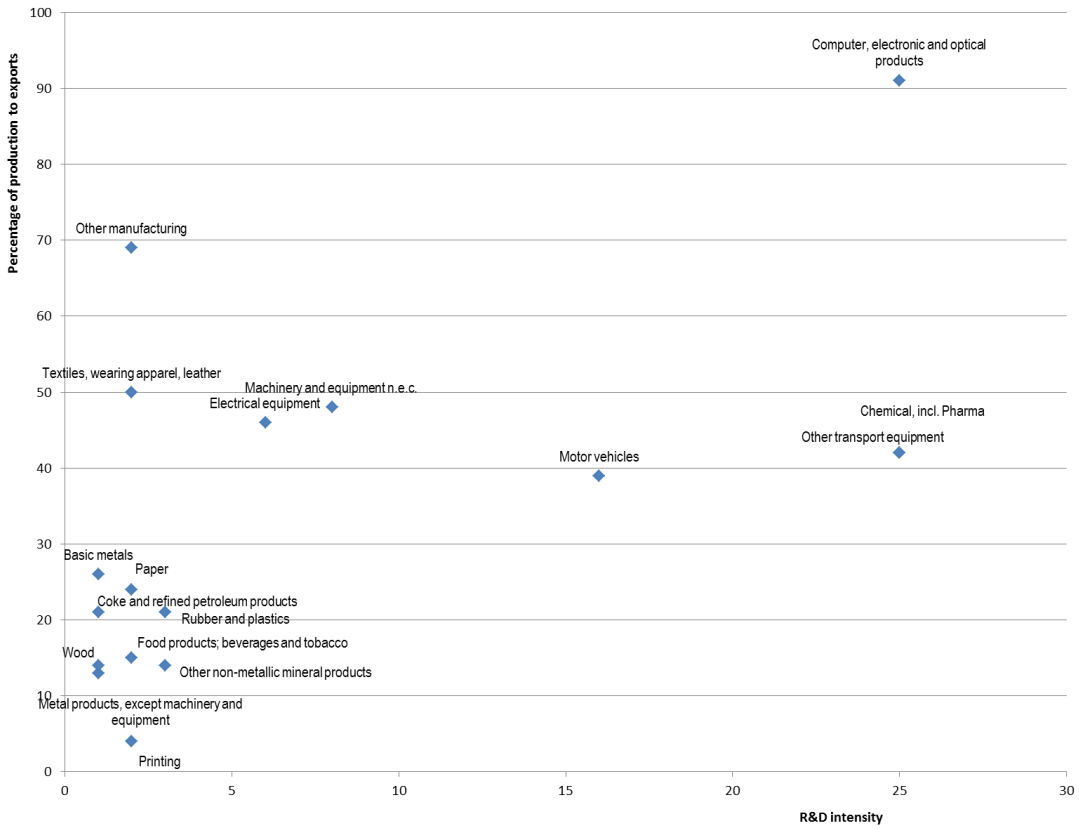


Figure 11. Export intensity vs R&D intensity

Facing a re-industrialization strategy, it is interesting to analyze the R&D intensity of the different aggregates according to their export intensity. In Figure 11 both features are represented in a scatter plot which shows that the highest export group includes aggregates with very varied R&D intensity. For example, among the sectors that export half or more of their production there are some having a R&D intensity of 25%, as it is the case of Computer, electronic and optical products, and others with an innovation intensity in the range of 2% to 3% , as it is the case of Other manufacturing or Textiles, wearing apparel and leather. In the group of intermediate export intensities (between 40% and 50%), there are also sectors with R&D intensities around 25% such as Chemicals or Other transport equipment, and sectors like Electrical equipment with 6%. It can be concluded that among the manufacturing sectors with high export rates both strategies, one based on low price and another one based on providing high value-added do coexist.

2.5 General overview of sectorial aggregates features

The variables considered in preceding paragraphs for the different sectorial aggregates in manufacturing are compared in this section. The comparison is made among those groups with similar R&D intensity. As shown in Figure 12, sector aggregates with low R&D intensity (Wood, Coke and refined petroleum products, Basic metals and Metal products exc. machinery and equipment) show a very limited export activity too. There is however a large scatter in the other variables values.

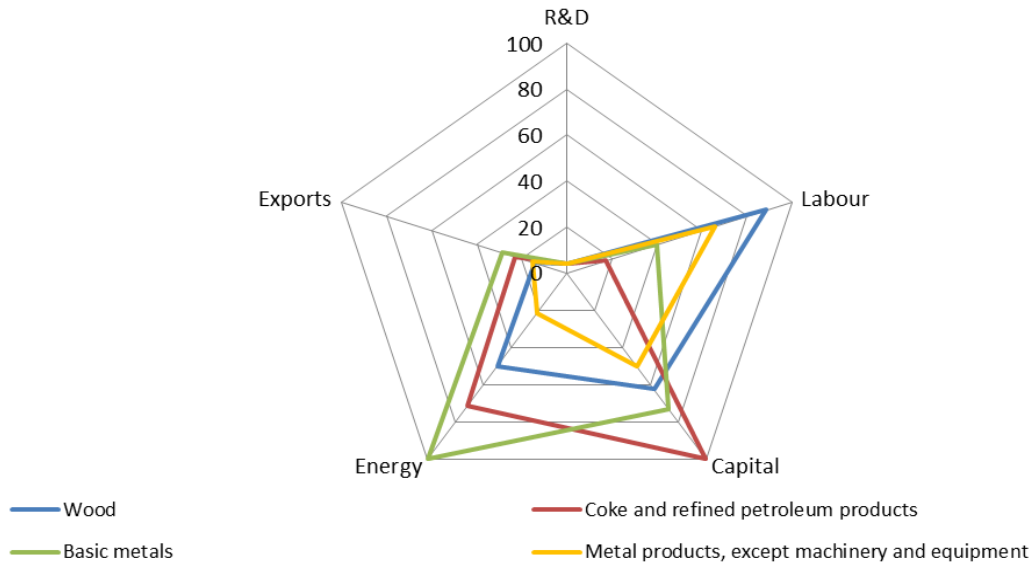


Figure 12. Comparison of variables from sectorial aggregates with low R&D intensity

Sectorial aggregates with medium-low R&D intensity (Food products; beverages and tobacco, Textiles, wearing apparel and leather, Paper, Printing, Other manufacturing, Rubber and plastics and Other non-metallic mineral products) have two different behaviors. Textile and Other manufacturing articles are very labour intensive and export a high percentage of their

production. In the other group, Paper and Other non-metallic mineral products stand out for their energy intensity, and the rest show average values for all variables (Figure 13).

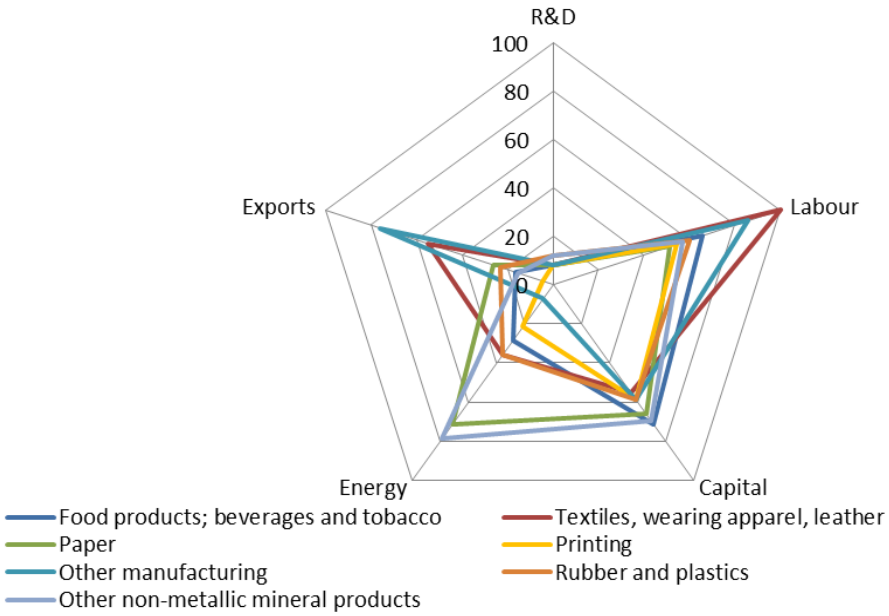


Figure 13. Comparison of variables from sectorial aggregates with medium-low R&D intensity

In sectors group with medium-high R&D intensity (Electrical equipment, Machinery and equipment n.e.c and Motor vehicles) it is just this variable the one showing the highest spread, while the others are much more gathered (figure 14).

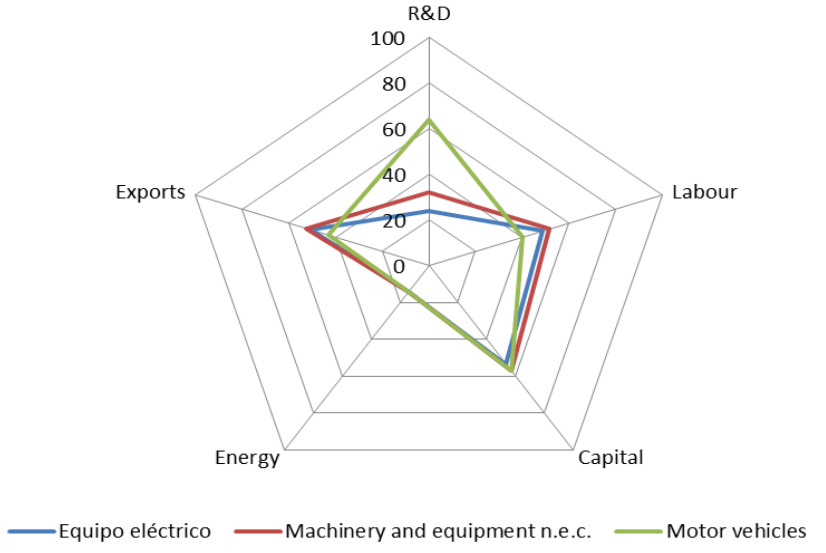


Figure 14. Comparison of variables from sectorial aggregates with medium-high R&D intensity

Finally, sectorial aggregates with the highest R&D intensity (Chemicals including Pharmacy, Computer, electronic and optical products, and Other transport equipment) show similar values in all variables except for the high value of exports in Computer Products and the higher energy intensity in Chemical products (figure 15).

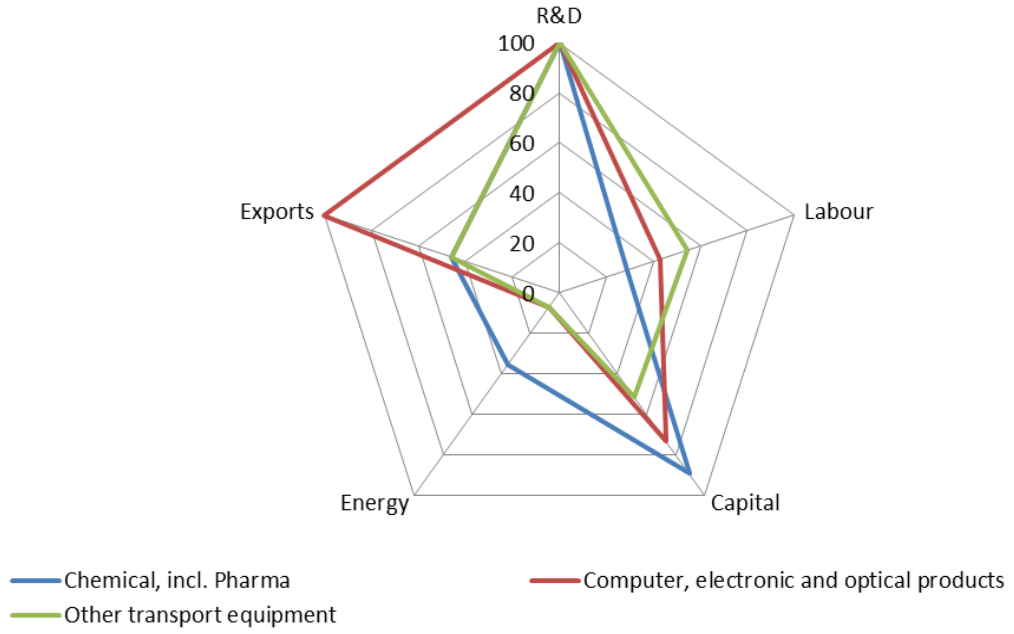


Figure 15. Comparison of variables from sectorial aggregates with high R&D intensity

2.6 Comparison of global sectorial aggregates features with those from Italy, Portugal and Spain

So far, figures used to characterize sectorial aggregates corresponded to global averages providing a general idea of these groups independently of the geographical location of its production, research and sales centers.

In this section, global features of the studied industry aggregates are compared with those specific of our three countries (Italy, Portugal and Spain), and in addition the ones from other European countries (Germany, France and the UK) were used as a reference. Thus, Apparent productivity of labour (measured as added value per worked hour), Return on capital (measured as a percentage of added value assigned to gross operating surplus); R&D intensity (measured as R&D expense referred to generated added value) and Export intensity (measured as value of exports referred to generated added value) have been calculated for each country, and resulting figures have been compared with the global ones managed so far.[1]

[1] Wood, Paper and Printing activities have been grouped in this section as no data for each activity were available

2.6.1 Apparent productivity of labour

The Apparent productivity of labour is calculated by dividing GVA generated by sectorial aggregates from each country by the number of hours worked. Table 1 shows GVA values of 2010.

	Germany	Spain	France	Italy	Portugal	United Kingdom
Manufacturing	455 788	106 153	193 929	205 589	17 916	167 546
Food products; beverages and tobacco	35 439	20 420	33 448	22 957	2 920	31 181
Textiles, wearing apparel, leather	6 501	4 357	5 777	18 671	2 390	3 607
Wood, paper and printing	23 196	8 494	10 977	12 587	2 110	11 870
Coke and refined petroleum products	5 976	2 163	2 957	1 838	498	2 811
Chemical, incl. Pharma	52 087	11 410	24 626	17 813	1 113	22 555
Rubber and plastics	21 909	5 374	10 879	9 973	890	8 025
Other non-metallic mineral products	13 339	6 796	7 908	10 297	1 473	4 930
Basic metals	17 802	4 798	6 186	8 220	330	4 645
Metal products, except machinery and equipment	42 089	11 269	18 107	24 844	1 998	13 447
Computer, electronic and optical products	22 996	1 862	9 774	7 115	318	10 482
Electrical equipment	36 632	4 551	8 212	10 166	829	5 164
Machinery and equipment n.e.c.	70 031	5 939	12 117	28 282	612	13 967
Motor vehicles	66 839	8 111	14 029	10 457	1 061	11 454
Other transport equipment	9 321	3 516	10 528	5 639	70	9 570
Other manufacturing	19 162	3 982	7 115	10 050	771	7 507

Table 1. GVA (factors cost) of the manufacturing sectors in several European countries in million euros (2010)
Source: Eurostat

Table 2 shows the number of hours worked in each sectorial aggregate in 2010 in the countries considered except France, as there is no data available for this variable.

	Germany	Spain	Italy	Portugal	United Kingdom
Manufacturing	10 225 202	3 282 796	5 639 485	1 199 879	4 510 217
Food products; beverages and tobacco	1 254 782	628 324	568 433	194 037	772 133
Textiles, wearing apparel, leather	204 128	221 612	695 920	312 156	161 207
Wood, paper and printing	647 029	300 565	406 152	108 192	450 597
Coke and refined petroleum products	33 520	14 415	27 144	3 129	17 637
Chemical, incl. Pharma	664 117	213 329	279 857	35 457	278 347
Rubber and plastics	589 831	163 949	279 374	42 988	289 569
Other non-metallic mineral products	341 766	220 154	302 846	84 300	181 392
Basic metals	389 232	110 423	199 153	15 551	134 354
Metal products, except machinery and equipment	1 182 224	445 246	772 412	148 034	525 587
Computer, electronic and optical products	456 178	54 865	172 265	14 918	223 493
Electrical equipment	732 699	122 201	256 040	33 793	168 945
Machinery and equipment n.e.c.	1 564 259	178 044	716 462	37 516	347 197
Motor vehicles	1 105 255	226 931	247 498	52 378	250 403
Other transport equipment	189 692	76 777	143 467	7 141	258 871
Other manufacturing	546 213	194 757	368 097	79 258	273 317

Table 2. Worked hours at manufacturing sectors in several European countries in thousands (2010)
Source: Eurostat

Apparent productivity of labour is calculated from these tables data, and is shown in table 3.

	Germany	Spain	Italy	Portugal	United Kingdom
Manufacturing	44,6	32,3	36,5	14,9	37,1
Food products; beverages and tobacco	28,2	32,5	40,4	15,0	40,4
Textiles, wearing apparel, leather	31,8	19,7	26,8	7,7	22,4
Wood, paper and printing	35,9	28,3	31,0	19,5	26,3
Coke and refined petroleum products	178,3	150,1	67,7	159,0	159,4
Chemical, incl. Pharma	78,4	53,5	63,7	31,4	81,0
Rubber and plastics	37,1	32,8	35,7	20,7	27,7
Other non-metallic mineral products	39,0	30,9	34,0	17,5	27,2
Basic metals	45,7	43,5	41,3	21,2	34,6
Metal products, except machinery and equipment	35,6	25,3	32,2	13,5	25,6
Computer, electronic and optical products	50,4	33,9	41,3	21,3	46,9
Electrical equipment	50,0	37,2	39,7	24,5	30,6
Machinery and equipment n.e.c.	44,8	33,4	39,5	16,3	40,2
Motor vehicles	60,5	35,7	42,2	20,2	45,7
Other transport equipment	49,1	45,8	39,3	9,8	37,0
Other manufacturing	35,1	20,4	27,3	9,7	27,5

Table 3. Apparent productivity of labour in euros of GVA generated per hour worked in the manufacturing sectors in several European countries (2010)
Source: Compiled from Eurostat data

Figure 16 compares the apparent productivity of labour of each sectorial aggregate in the studied countries with global average values.[2] A figure of one hundred indicates that country variable has the same value than world average.

Most industry aggregates in all countries studied show a lower apparaent productivity of labour than world average, except Germany which has 15% higher value.

[2] It should be noted that the figures used for global variables correspond to different years between 2006 and 2010, while the values of GVA, hours worked, gross operating surplus and R&D for the European countries studied correspond to 2010. Calculation of the percentage of GVA assigned to export in European countries was performed using data from 2007, except in the case of Portugal where 2006 were used.

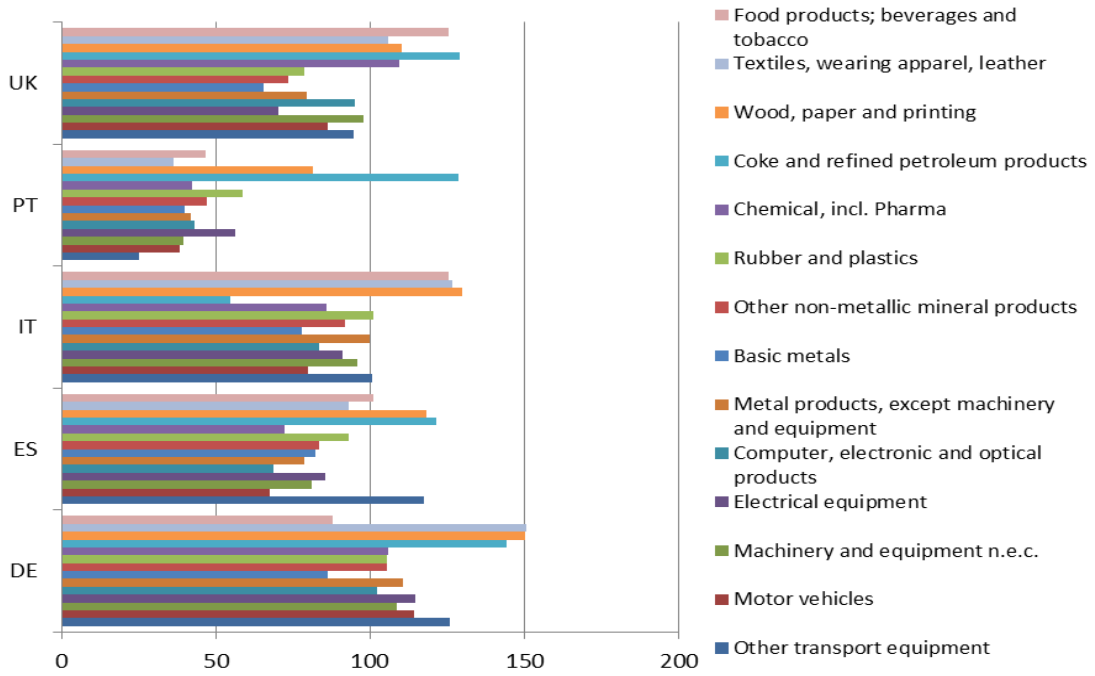


Figure 16. Comparison of apparent productivity of labour of sectorial aggregates from the different European countries with global averages

2.6.2 Contribution of capital to GVA

Contribution of capital to GVA in each sectorial aggregate has been estimated by dividing the gross operating surplus shown in table 4 by generated GVA (table 1).

	Germany	Spain	France	Italy	Portugal	United Kingdom
Manufacturing	133 522	37 759	46 652	75 441	6 907	80 817
Food products; beverages and tobacco	11 436	9 275	11 156	10 726	1 244	17 604
Textiles, wearing apparel, leather	1 898	1 212	1 205	6 331	453	1 600
Wood, paper and printing	6 549	2 916	1 754	4 366	1 025	4 647
Coke and refined petroleum products	4 250	1 520	1 451	804	327	1 957
Chemical, incl. Pharma	22 824	4 991	9 396	8 244	515	15 117
Rubber and plastics	6 066	1 949	2 349	3 504	440	3 333
Other non-metallic mineral products	3 965	2 115	2 074	3 343	645	1 704
Basic metals	4 766	1 825	1 662	2 923	146	1 361
Metal products, except machinery and equipment	11 671	2 778	3 289	8 851	620	4 859
Computer, electronic and optical products	6 753	608	761	2 267	112	5 660
Electrical equipment	9 237	1 617	1 659	3 762	411	2 052
Machinery and equipment n.e.c.	15 680	1 831	2 764	9 386	210	6 082
Motor vehicles	18 843	2 318	1 819	3 765	416	5 714
Other transport equipment	1 440	1 164	2 296	1 590	-5	2 983

Table 4. Gross operating surplus of sectorial aggregates from several European countries in million euros (2010)
Source: Eurostat

Table 5 shows the gross operating surplus as a percentage of GVA for each sectorial aggregate in the different countries.

	Germany	Spain	France	Italy	Portugal	United Kingdom
Manufacturing	29,3%	35,6%	24,1%	36,7%	38,5%	48,2%
Food products; beverages and tobacco	32,3%	45,4%	33,4%	46,7%	42,6%	56,5%
Textiles, wearing apparel, leather	29,2%	27,8%	20,9%	33,9%	19,0%	44,4%
Wood, paper and printing	28,2%	34,3%	16,0%	34,7%	48,6%	39,1%
Coke and refined petroleum products	71,1%	70,3%	49,1%	43,7%	65,7%	69,6%
Chemical, incl. Pharma	43,8%	43,7%	38,2%	46,3%	46,2%	67,0%
Rubber and plastics	27,7%	36,3%	21,6%	35,1%	49,4%	41,5%
Other non-metallic mineral products	29,7%	31,1%	26,2%	32,5%	43,8%	34,6%
Basic metals	26,8%	38,0%	26,9%	35,6%	44,1%	29,3%
Metal products, except machinery and equipment	27,7%	24,7%	18,2%	35,6%	31,0%	36,1%
Computer, electronic and optical products	29,4%	32,6%	7,8%	31,9%	35,3%	54,0%
Electrical equipment	25,2%	35,5%	20,2%	37,0%	49,6%	39,7%
Machinery and equipment n.e.c.	22,4%	30,8%	22,8%	33,2%	34,4%	43,5%
Motor vehicles	28,2%	28,6%	13,0%	36,0%	39,2%	49,9%
Other transport equipment	15,5%	33,1%	21,8%	28,2%	-7,4%	31,2%

Table 5. Gross operating surplus as a percentage of GVA sectorial aggregates in several European countries (2010)
Source: Compiled from Eurostat data

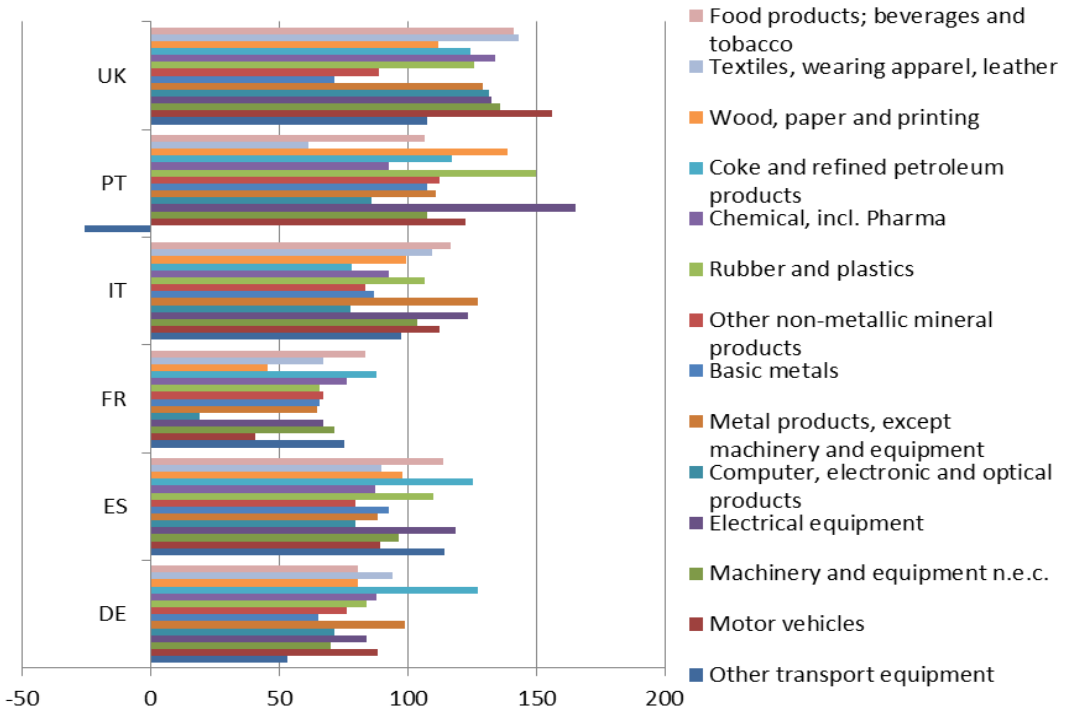


Figure 17. Comparison of capital contribution to GVA in sectorial aggregates of the different countries with global averages.

Figure 17 compares capital contribution to GVA referred to global averages in each sectorial aggregate in the countries studied. A value of one hundred indicates that the variable has the same value in that country as the world average.

2.6.3 R&D intensity

R&D expense in each sectorial aggregate of the studied countries is shown in table 6.

	Germany	Spain	France	Italy	Portugal	United Kingdom
Manufacturing	40 241	3 346	13 989	7 578	412	6 954
Food products; beverages and tobacco	329	198	331	164	47	270
Textiles, wearing apparel, leather	124	84	135	424	21	13
Wood, paper and printing	208	45	56	69	25	21
Coke and refined petroleum products	89	60	108	9	sd	15
Chemical, incl. Pharma	6 861	878	1 898	921	108	907
Rubber and plastics	833	104	664	238	20	78
Other non-metallic mineral products	285	71	159	95	22	48
Basic metals	493	73	118	96	12	58
Metal products, except machinery and equipment	713	137	612	267	27	692
Computer, electronic and optical products	5 995	232	3 087	1 379	19	963
Electrical equipment	1 345	206	612	434	34	190
Machinery and equipment n.e.c.	4 597	216	942	1 063	14	724
Motor vehicles	14 812	382	1 789	1 075	40	584
Other transport equipment	2 514	573	3 050	1 135	3	1 349

Table 6. R&D expense in sectorial aggregates of several European countries in million euros (2010)
Source: Eurostat

R&D intensity is calculated through the quotient of the expense shown in table 6 by the corresponding GVA from table 1. Resulting figures are shown in table 7.

	Germany	Spain	France	Italy	Portugal	United Kingdom
Manufacturing	8,8%	3,2%	7,2%	3,7%	2,3%	4,2%
Food products; beverages and tobacco	0,9%	1,0%	1,0%	0,7%	1,6%	0,9%
Textiles, wearing apparel, leather	1,9%	1,9%	2,3%	2,3%	0,9%	0,3%
Wood, paper and printing	0,9%	0,5%	0,5%	0,6%	1,2%	0,2%
Coke and refined petroleum products	1,5%	2,8%	3,7%	0,5%	sd	0,5%
Chemical, incl. Pharma	13,2%	7,7%	7,7%	5,2%	9,7%	4,0%
Rubber and plastics	3,8%	1,9%	6,1%	2,4%	2,2%	1,0%
Other non-metallic mineral products	2,1%	1,0%	2,0%	0,9%	1,5%	1,0%
Basic metals	2,8%	1,5%	1,9%	1,2%	3,7%	1,2%
Metal products, except machinery and equipment	1,7%	1,2%	3,4%	1,1%	1,3%	5,1%
Computer, electronic and optical products	26,1%	12,5%	31,6%	19,4%	6,1%	9,2%
Electrical equipment	3,7%	4,5%	7,5%	4,3%	4,1%	3,7%
Machinery and equipment n.e.c.	6,6%	3,6%	7,8%	3,8%	2,2%	5,2%
Motor vehicles	22,2%	4,7%	12,8%	10,3%	3,8%	5,1%
Other transport equipment	27,0%	16,3%	29,0%	20,1%	4,4%	14,1%

Table 7. R&D intensity in sectorial aggregates of different European countries (R&D expense as a percentage of GVA) (2010)
Source: Compiled from Eurostat data

Figure 18 compares the R&D intensity in each sectorial aggregate of the studied countries referred to world averages. A value of one hundred indicates that the variable has the same value in that country as the world average.

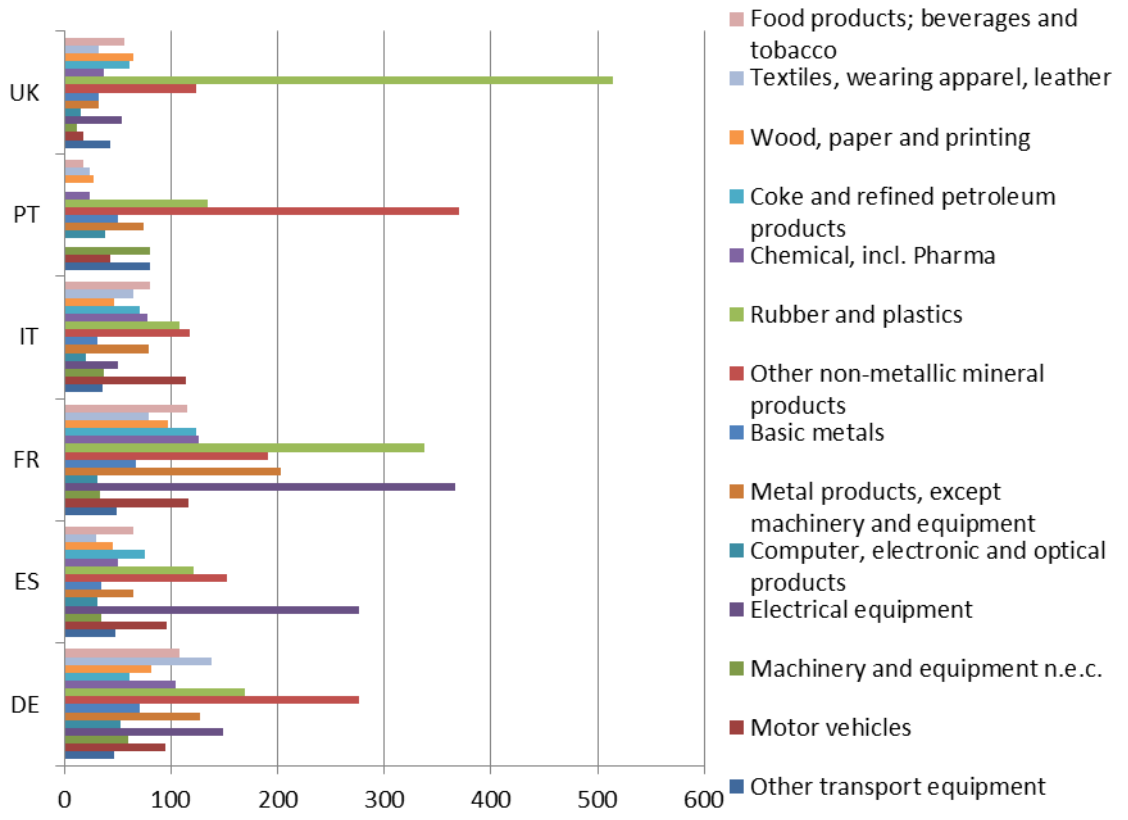


Figure 18. R&D intensity in sectorial aggregates of different European countries compared to global averages

2.6.4 Export intensity

Production value in sectorial aggregates of the studied countries in 2007[3] is shown in table 8 (local currency and current prices).

[3] Except for Portugal whose data correspond to 2006

	Germany	Spain	France	Italy	Portugal	United Kingdom
Manufacturing	1675	555	876	1001	77	454
Food products; beverages and tobacco	154	94	129	115	13	68
Textiles, wearing apparel, leather	27	22	24	100	10	10
Wood, paper and printing	114	46	63	69	8	54
Coke and refined petroleum products	61	34	59	52	6	23
Chemical, incl. Pharma	157	48	102	78	5	56
Rubber and plastics	66	20	36	39	3	20
Other non-metallic mineral products	41	38	33	46	6	15
Basic metals	108	41	45	58	2	17
Metal products, except machinery and equipment	123	48	67	110	5	30
Computer, electronic and optical products	113	12	45	42	4	31
Electrical equipment	97	22	30	41	2	13
Machinery and equipment n.e.c.	225	30	63	128	3	34
Motor vehicles	313	63	95	51	5	41
Other transport equipment	38	14	59	24	1	23

Table 8. Production value in sectorial aggregates of several European countries in billions of local currency (2007, except Portugal, 2006)
Source: OECD Stats

Table 9 shows export value in sectorial aggregates of different countries (same years and units as in table 8).

	Germany	Spain	France	Italy	Portugal	United Kingdom
Manufacturing	898	170	363	348	32	181
Food products; beverages and tobacco	38	16	33	19	2	11
Textiles, wearing apparel, leather	26	10	18	43	5	6
Wood, paper and printing	34	6	11	9	3	6
Coke and refined petroleum products	19	8	13	13	2	9
Chemical, incl. Pharma	126	23	61	33	2	36
Rubber and plastics	32	6	12	13	1	5
Other non-metallic mineral products	12	5	5	10	1	2
Basic metals	55	13	23	26	1	12
Metal products, except machinery and equipment	32	6	10	17	1	5
Computer, electronic and optical products	95	7	33	17	3	24
Electrical equipment	48	8	18	15	1	8
Machinery and equipment n.e.c.	149	12	36	77	2	21
Motor vehicles	182	40	51	30	4	25
Other transport equipment	31	6	31	11	0	14

Table 9. Export value in sectorial aggregates of several European countries in billions of local currency (2007, except Portugal, 2006)
Source: OECD Stats

Export intensity estimated as the percentage of the export value in total production is shown in table 9.

	Germany	Spain	France	Italy	Portugal	United Kingdom
Manufacturing	53,6%	30,5%	41,5%	34,8%	41,8%	39,9%
Food products; beverages and tobacco	24,5%	17,1%	26,0%	16,6%	18,8%	15,8%
Textiles, wearing apparel, leather	96,4%	46,7%	73,1%	43,0%	50,9%	59,8%
Wood, paper and printing	29,3%	13,1%	17,9%	12,6%	30,4%	11,1%
Coke and refined petroleum products	31,4%	23,3%	21,4%	25,3%	26,0%	38,1%
Chemical, incl. Pharma	80,4%	47,9%	60,4%	42,2%	50,1%	64,0%
Rubber and plastics	49,2%	30,5%	33,8%	33,5%	49,9%	27,5%
Other non-metallic mineral products	29,0%	13,9%	15,7%	21,8%	23,3%	14,4%
Basic metals	50,9%	31,6%	51,6%	44,8%	56,6%	70,3%
Metal products, except machinery and equipment	26,4%	11,8%	14,8%	15,4%	26,5%	15,6%
Computer, electronic and optical products	83,9%	57,8%	74,3%	40,4%	82,6%	78,0%
Electrical equipment	50,2%	33,9%	59,3%	35,5%	60,6%	59,2%
Machinery and equipment n.e.c.	66,3%	39,9%	56,7%	60,2%	60,7%	61,5%
Motor vehicles	58,1%	64,6%	53,6%	58,1%	88,5%	59,9%
Other transport equipment	81,7%	46,2%	53,1%	46,8%	36,6%	59,5%

Table 9. Export intensity in the industry aggregates of several European countries
Source: Compiled using data from OECD Stats

Export intensity in each sectorial aggregate of the studied countries is compared to global average in figure 19. A value of one hundred indicates that the variable has the same value in that country than the world average.

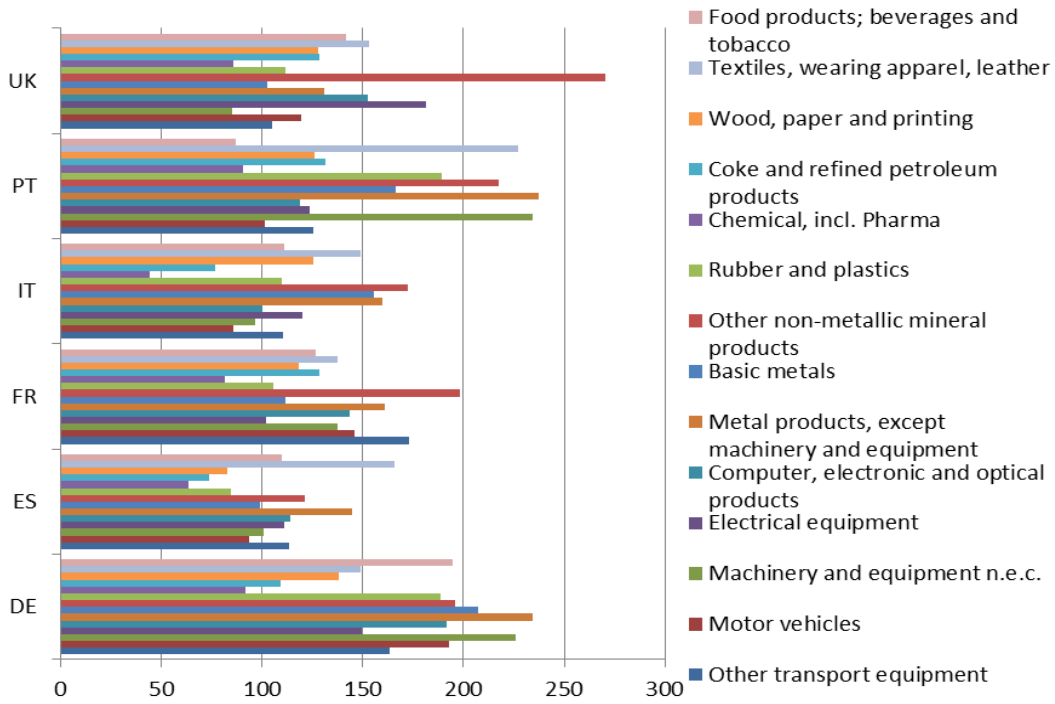


Figure 19. Comparison of export intensity in sectorial aggregates of several European countries with global averages.

3. Major lines for re-industrialization

Any re-industrialization strategy should pursue the objective of getting the adequate environment to stimulate development of manufacturing enterprises whatever their size and sector would be, and to attract foreign companies. The appeal of an environment is determined by appropriate business practices, intelligent and assumable regulations, as well as easy access to trained human resources and to modern services.

A sustainable re-industrialization will only be achieved when new businesses in high value added niches continuously emerge, and these are able to overcome the always uncertain phases of skills and business consolidation to enter afterwards in a phase of fast growth. These companies will integrate into the existing fabric where they will find markets, partnerships and new business opportunities.

The degree of vitality reached by this fabric will condition the return of overseas manufacturing activities and the incorporation of foreign companies with their own cultures. Thus, manufacturing sector will be competitive as a whole, because it will rely on providers which will add value to the final product with intermediate supplies of the highest quality. The value of a product is the result of a chain where the company selling it is often just the latest link. This means that a sector competitiveness is not only achieved with the accountability of a single business owner but needs the contribution from all the companies involved in the value chain.

In the current situation, development of a manufacturing sector is unbelievable without the involvement of the entire country, as it requires a major social change to allow middle class to resume its role. This is impossible to happen without a clear awareness of the society and of course without the strong involvement of public administrations.

Public administrations are currently complex, because they are based on an intense network of several administrative levels with multiple and specialized institutions whose responsibilities include to coordinately drive the manufacturing sector. This is the reason why the concept of department policies is being replaced by that of a strategy targeting a specific objective which is composed of multiple duly harmonized policies. Thus, in the case of re-industrialization, policies as different as those of regulation and innovation, or as energy and environment should be made compatible.

Fortunately, global economic development is fading the benefits which justified the offshoring of manufacturing activities and is inducing a more favorable scenario for re-industrialization in the Western world. The continued trend in the emerging countries to increase labour costs means that they can no longer compensate for other costs induced by offshoring such as transportation, quality control, or other benefits of management such as being fast to follow customer requirements or to the typical difficulties of the market. Any decision to accelerate re-industrialization process will have important consequences in the immediate future of the West countries.

3.1 Areas of activity

Aspects to be addressed by a re-industrialization strategy are at least technological, infrastructures, fiscal, commercial, and human resources training.

3.1.1 Technological field

Manufacturing sector is highly technological innovation demanding as this is one of the critical foundations of its competitiveness. Technological solvency will be the most important objective in the design of the new environment by far.

Technological solvency of the environment will primarily lie in the technological capacity of every enterprise, and especially in the SMEs as they are the ones providing highly technological intermediate goods in this sector. Based on technology from the big enterprises, supplies specifications of needed goods are established achieving a pulling effect over the SMEs. Due to their particular characteristics, it is well known that these enterprises have real difficulties to develop their own technological capacities and a good environment should contribute to overcome them.

It is very important that environment possess enough capacity to generate both scientific and technological knowledge, and this capacity should be accessible to all companies. Excellence of public R&D is a compulsory goal of any re-industrialization strategy and this excellence should be oriented to the business needs of the manufacturing sector with the help of the

appropriate ways of public-private partnership. Moreover, technological centers play an important role in the generation and adaptation of technologies. These centers main feature is their proximity to the productive sector which provides them with a direct knowledge of companies's problems and capabilities enabling them to intervene in the search of the most suitable solutions.

There is room for Governments intervention in the creation of technologically solvent environments, both in the generation of new technologies and in providing access to any type of technology, especially to SMEs.

New technologies development has to frequently face market failures. Companies engaged in pioneering R&D activities are not the only ones which reap the benefits of their investment, as many other companies or industries take advantage of the dissemination of that knowledge without any contribution to the investment.

For this reason, new technologies with a high potential for growth and job creation, whose application is wide in several industry types, are those technologies in which individual private firms particularly invest below the optimal levels socially expected. Thus public investment has always been critical in the early stages of R&D.

It is important to distinguish between support to specific technology areas and support to specific technology companies. This is not a matter of governments operating as venture capitals, though they can take the appropriate measures to enhance the progress in key areas such as the support to applied research in promising technologies and to precompetitive public-private partnerships. Measures like these are economically justified when market failures are clearly limiting the progress of technologies with enough potential impact to transform employment and production, and this will result in sustainable competitive advantages. Such measures are particularly appropriate for the development of technologies addressing social challenges and technical and scientific problems of country importance.

Another area of Governments intervention is to facilitate access to the sources of technology and technological services, especially for SMEs because the minimum investment required is too big for an individual company, and effective ways to access to shared services do not frequently exist. Making easier this access will allow enterprises to improve their ability to quickly create prototypes and produce small batches, to customize products to particular consumers and customers, to reduce stocks, and to expand the range of products that can be manufactured, among other things.

A technology solvent environment could also induce collaboration between large and small companies. On the one hand, SMEs frequently have the ability to develop very specific technologies and to quickly respond to customer needs and to market changes, but lack sufficient commercial and financial capacity to put their products on the market. On the other hand, although large companies have broad catalogs of available technologies and are fully able to manage complex projects both for their size and for the variety of technologies

involved, they frequently lack sufficient thorough knowledge of certain technological areas that are well understood by SMEs. Unlike the latest companies, large enterprises do have however enough financial capacity and international visibility to sell products in bulk and in any location worldwide.

There is also a clear complementarity between large and small firms in technological terms, since the former tend to focus on improving their existing product lines with incremental innovations, while the small ones are more likely to achieve radical innovations being straight when they have to develop and take advantage of disruptive technologies to do it.

Furthermore, any environment can generate all the technology that manufacturing sector needs, so another of its virtues should be not to complicate the acquisition of the best technology available anywhere in the world. Difficulties are both regulatory and cultural, and could even stop the development of a sector. In their studies, some experts have established the importance of technology absorption capacity for economic development, while some others attribute to human capital a main role in facilitating the adoption of new technologies on top over the improvement of productivity in already established tasks. This reinforces the importance of training policies.

U.S.A. Government support, key for new technologies development

It is well recognized that substantial public funding, in some cases associated with private investment, was instrumental in the development of the transistor by Bell Laboratories in the 1950s, the subsequent growth of the semiconductor industry and the birth of Silicon Valley. The U.S. Federal Government financed in part the large corporate laboratories that laid to the foundations for this country's economic and innovation leadership in the 20th century, including Xerox PARC, the David Sarnoff Research Center of RCA, and Bell Labs AT&T. Thus, the public-private funding has been present in most major U.S. innovations of the past decades.

More recently, in the late 80s, SEMATECH consortium was born as a collaboration between DARPA and 14 semiconductor manufacturers located in the U.S., as a reaction to the fact that Japan was monopolizing much of the memory chip market, which was perceived as a risk to national security and competitiveness. SEMATECH involved an investment of 1000 million dollars in five years, 50% each the Federal Government and the companies, that funded the advanced pre-competitive research in the technology needed for the next generation of chips. This project also allowed manufacturers of equipment for this industry to benefit not just from funding but also from direct contact with their future clients, the semiconductor manufacturers.

Under similar proposal long-term funding from DARPA and later from NSF allowed the development of Internet, which in addition to basic science also required the development and demonstration of technologies such as packet switching, communication protocols and network infrastructure, which are in the basis of the powerful computer and communications equipment U.S. manufacturing industry. These investments were made in areas where it would have been difficult for private companies to get the necessary investment and to hold it for such long term periods as those needed for recovery.

Report to the President on ensuring American Leadership in Advanced Manufacturing.

3.1.2 Infrastructures

Although manufacturing sector does not have special requirements, its competitiveness depends on the quality and efficiency of infrastructure services in the fields of energy, transport and telecommunications. According to Deloitte in 2013, over 89% of the manufacturing business owners in the U.S., Japan and Germany considered the quality of the infrastructures an essential component of their competitiveness.

The availability of energy at competitive costs favours re-industrialization. Industry consumes a quarter of the energy in Europe[4] and a third in the United States.[5] This is why modernization of electricity distribution networks which can lose up to a third of the energy transported[6] is so important, as well as progression in the development of alternative energies.

No less important is the availability of advanced communication and information technology systems, which should follow the evolution of broadband networks and the Internet. An advanced telecommunications and data networks infrastructure allows daily operation of enterprises and their economic security. The quality of these networks is every day more and more important because they are the ones providing the efficient operation of water supplies, energy and transportation security, at the same time they ensure the integrity of critical data in the financial, health and legal fields.

Otherwise competitive manufacturing requires advanced logistic systems based on modern transportation infrastructures that enable the efficient movement of people, materials and products.

3.1.3 Tax area

Tax conditions are always among the best appeals of any business environment, and the manufacturing sector is no an exception. These attractiveness can be of different types. Some of them directly affect company profit as they establish tax rates that favor the establishment or creation of companies in the country. Other ones are concerned to investments in particular assets and activities which could stimulate research and innovation in this case, and even the employment of qualified staff. Other conditions could affect the marketing of products through a suitable value-added tax. Finally, there are different ways to approach depreciation which could promote modernization of material assets.

Nominal tax rates to companies (national, regional and local) have been declining in both advanced and emerging economies. These have fallen down from over 50% in 1980 in countries such as France, Germany and the UK to the current average of about 23% in the

[4] Directorate-General for Energy, European Commission

[5] MAKE: American manufacturing

[6] MAKE: American manufacturing

OECD countries. Although effective taxes may differ significantly from the nominal ones after the application of any possible adjustment and exemption available in each country, several studies confirm that nominal rates really influence in location decisions due to its impact on the cost of capital, in the ROI, and in the competitive position. This appear to happen even if the effective tax rate paid by companies is lower than nominal.

In some cases, countries have reduced their tax rates in combination with other incentives to attract particular industries, e.g. Ireland has offered lower rates to businesses, either directly or through tax incentives to R&D, intended to attract pharmaceutical companies. These tax benefits could be applied to R&D, to manufacture, or to both. As a result, an efficient tax planning could reduce taxes paid by up to 60 percent. Even when manufacturing is done elsewhere, profits attributable to the intellectual property of a specific drug can be recorded in the country with tax benefits provided that the medication is registered there in the early stages of its life cycle and a relevant R&D activity had been performed in the country.

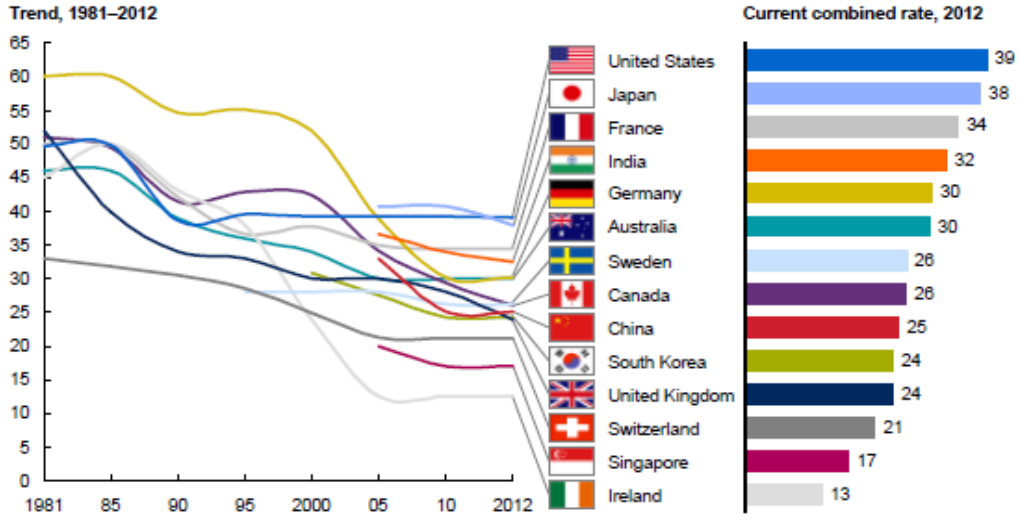
Even being low taxes an incentive, they are rarely the only reason to determine a location anyway. Tax tend to be less important in industry sectors where profit margins are lower, and especially when trading among subsidiary entities located in different countries is high as this allows them to transfer prices to shift their profit to more favorable countries.

It should be noted that what persuades manufacturing companies to invest or expand themselves in specific countries is often a combination of low tax rates with other factors, such as the increase of domestic demand, a security in the protection of intellectual property or a skilled workforce. Studies on the investments of multinational companies confirmed that most of them would rather prefer countries investing in infrastructure and talent than offering lower tax rates.

	Tax rate	VAT
Spain	30	21
Portugal	29,5 - 31,5	23
Italy	27,5 (nominal)	21
India	32,4 - 42,0	12,5
USA	39,5	Depends on each State
China	25	17
Japan	38	5
Brazil	34	17
Germany	30-33	19

Total (national and state/local) statutory corporate tax rates have declined over the past 30 years in most large manufacturing countries

Statutory corporate tax rates in select OECD countries and emerging economies[1]
%



1 Data show the basic combined central and sub-central (statutory) corporate income tax rates (i.e., combined national, state/regional and local tax rates).

SOURCE: OECD Tax Database; KPMG; McKinsey Global Institute analysis

3.1.4 Commercial field

Any business strategy must have a commercial dimension to seek expansion in both domestic and foreign markets. No doubt that a good incentive would be to achieve uniformity of national markets while trade agreements with other countries are obtained. Moreover, it is common to find support for international trade, especially for SMEs, which range from the access to information and the assistance from experts, to loans for export activity.

Public procurement has traditionally been an important tool for industrial policies though not exempt of criticisms. Sometimes it has allowed the emergence and development of business sectors that have achieved competitiveness in the global market, while in others cases it has prevented a selection of the really efficient firms. A good use of public procurement may also create new markets, which is the aim of the so-called public procurement of technological innovation. In this case, public purchaser defines a non-existing product or service that will meet better the needs of the service charge. Thus, following public procurement standardized guidelines, public tender awarded companies will be the best positioned to deal with similar requests to arise anywhere in the world. Administrations skillfully resorting to this instrument will greatly help a re-industrialization strategy.

Public procurement of innovative technology of the U.S. Government has historically been essential to the creation of many new industries through support to basic research and funding proofs of concept to companies involved in this innovation promotion policy instrument. There have been many the agencies involved in public procurement of innovative technology in this country such as the Department of Defense, Department of Energy, the National Institutes of

Health and NASA. This route has helped to create entire industry sectors, hundreds of companies and millions of high quality jobs in the U.S. for decades.

3.1.5 Human resources training

Manufacturing sector requires trained manpower at all levels of employment, and this is a limiting factor in its evolution worldwide. In 2011 in the U.S.A., 43% of manufacturing companies reported to have a great difficulty to hire skilled enough staff. Shortage of highly skilled workers is estimated in 13% worldwide, and 10% in developed countries. Related to medium-skilled workers the figure is 15% globally. These figures are unfortunately deteriorating in the advanced economies with the aging of population. Around 65% of skilled workers in the U.S.A. are more than 45 years.

Under this scenario, re-industrialization of a country will certainly be limited by the ability it will have to provide enough staff sufficiently qualified to perform the work required by the manufacture. Therefore this problem not only affects all levels of education, but also companies if they become able to retain qualified staff and specialize the hired new staff through training on their internal knowledge.

Continuous training thus becomes the most appropriate way to maintain and increase the skills of company staff. A majority of this training could only be provided at companies facilities and quite likely be given by its most expert staff. External and highly qualified trainers will be needed when the objective was to increase the company technological level.

Vocational training is the natural education level to train the new medium-skilled employees. This training cannot be defined neither given without considering the judgment and the active involvement of manufacturing sector. Germany has always been considered a model for this type of training and they have introduced for many years a training system which combines the classroom with the practical workshop, a system that other countries try to copy.

University education in our countries prepares young graduates much further than our economies require, and in fields poorly demanded by the industry. Under a possible re-industrialization scenario, it will be necessary to rebalance the distribution of degrees if the current one is not able to meet the demand arising, although this will surely need to adapt curricula to the new requirements.

With regard to training, the most significant difference between traditional and current manufacturing is the quantitative importance acquired by the well trained workers. While unskilled labor was the backbone of the labor force of traditional industry, the intensive use of advanced technologies by the contemporary industry poses growing training requirements for industrial employees, which are sometimes difficult to meet. Thus, 67% of companies recently surveyed by a U.S. industry association perceived a shortage of skills and denounced a moderate to severe shortage of qualified workforce, even in periods of high unemployment rates. In some sectors, such as aerospace, defense and medical instruments, this perception was even higher.

Therefore, a key component of a national strategy for re-industrialization should be an educational system that anticipates and satisfies training requirements of the advanced manufacturers, keeping in mind the long-term labour demand forecasts. Private sector confidence in the availability of adequate manpower for advanced manufacturing activity encourages investment in the country.

As more advanced manufacturing technologies are deployed, both initial and continuous training become more costly and difficult. Training at workplace may become inaccessible for SMEs, so re-industrialization strategy will have to strongly consider the needs of these companies in its training area.

Public policy intervention models

For most policy goals, the spectrum of available public policy interventions ranges from a hands-off approach to becoming a central actor in a particular sector. We find it useful to think about the policies in four categories that are arranged according to increasing intensity of intervention. In order of intensity, the intervention models are as follows:

- Setting the ground rules and direction. Government sets the regulatory environment (i.e., labor, capital-market, and general business regulations) and lays out broad national priorities and road maps.
- Building enablers. Without interfering directly in the market, governments can help enable sector growth with hard and soft infrastructure investments: educating and training a skilled workforce, supporting R&D and basic research, and upgrading highways and ports.
- Coordinating interventions. Governments can create favorable conditions for local production through coordinated multi-agency actions at the national, regional, and sector levels—such as providing investment support or by shaping demand through public purchasing or regulation.
- Playing the principal actor. At the interventionist end of the policy spectrum, governments establish state-owned or -subsidized companies, fund existing businesses to ensure their survival, and actively restructure industries.

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4. Speed-up of re-industrialization process – some ideas

After many years accepting that it was possible to achieve a robust economic system without a developed manufacturing sector inducing to dismantle large industrial sectors in our economies, current reality requires the recovery of the lost capacity as soon as possible and adapt it to the economic, technological and commercial characteristics of the global market. This responsibility should be assumed by both the private and the public sectors. Many of the ideas which supported the instruments that once allowed to establish and maintain our industrial activity will be valid along with others to accelerate re-industrialization process and to take the advantage of new possibilities open in the technological, financial and commercial fields.

4.1 Ideas to technological acceleration

The degree of competitiveness of the new manufacturing sector will depend on its technological and innovation capacity, which would be reached by making technology, recruitment of highly qualified staff and knowledge more accessible. All that will not be possible without financial resources tailored to the needs of innovative companies. Summarized below are a number of ideas that could accelerate manufacturing sector technological update and relevant financial instruments.

4.1.1 Technological Programs

Both public and private technological programs directed to speed up re-industrialization will have to at least address the following topics:

a) **Adoption of new technologies**. These programs should include both monitoring of technological developments as well as identification of the adequate technologies for the business and, when appropriate, their integration. It should be taken into account that the adoption of new technologies usually requires both training the staff to manage them and investments needed to adapt facilities.

b) **Technology audits**. Manufacturing sector sustainability can be guaranteed with appropriate technology audits which will provide advice concerning the expected evolution of the sector and about those technological solutions to enable companies to maintain their competitiveness.

c) **Technology marketing**. The existence of an agile technology market should be facilitated by appropriate programs fostering technological information flow and bringing technology offer and demand closer thus reducing transaction costs.

d) **R & D collaboration**. When development of new technology was needed, these programs should facilitate collaboration to happen, both among companies and of these with public R&D.

e) **Common technology services centers**. Especially for SMEs, technological service centers, both publicly owned and private, are a recognized source of technologies and training. For this reason, technology needs of these companies may demand the existence of programs directed to these centers.

4.1.2 Financial instruments

Technological update of advanced manufacturing enterprises requires a variety of financing tools adequate to the different investment purposes which at least could be:

a) **Product and services development projects**. Despite the diversity of projects, instruments required for this type of activity have a relatively short temporary scope and quite easy risk levels assessment in each case.

b) **Grants for company growth**. A company's productivity increases with its size. Acceleration of re-industrialization requires a fast business growth, either through a vegetative way or with mergers and acquisition processes that will increase their productivity. Financial system must have adequate tools to meet these needs.

c) **Projects to modernize production facilities**. Manufacturing sector is under a continuous process to improve its production processes, which requires appropriate financial instruments.

d) **Pre-competitive R&D projects**. Such projects are essential to maintain long-term competitiveness of the manufacturing sector. As these projects imply a high risk which is difficult to evaluate it is quite usual that public entities get invovled in its financing.

4.2 Ideas to business improvement

SMEs are very important for manufacturing sector operation, but due to their size they have more limited financial, business and relationship skills. It thus makes a lot of sense that both business associations and public institutions create mechanisms to facilitate these enterprises to grow. The following are common areas for action:

a) **Export plans**. The intervention of experts to help SMEs to plan their international trade as well as the availability of direct export subsidies would favour their approach to international markets.

b) **Energy efficiency plans**. Energy costs are always important in the manufacturing sector. Planning and the implementation of the most adequate technologies is a common way to reduce these costs, though in order to achieve it SMEs have to resort to external experts.

c) **Plans to improve productivity**. The great competitive advantage of SMEs in the manufacturing sector is their ability to offer their customers personalized solutions in a relatively short time. However, their ability to organize an efficient production and ensure the adequate quality levels is more limited. Again, external aid is a very good solution to fill this gap.

d) **Get acquainted with international standards**. One of the most frequent barriers for foreign suppliers to entry into domestic markets is a complex and demanding regulation, which excludes small size companies from competition as they do not have sufficient capacity to know and understand it. External help allows SMEs to become familiar with the regulatory packages required in their markets of interest.

4.3 Ideas to strengthen value chain

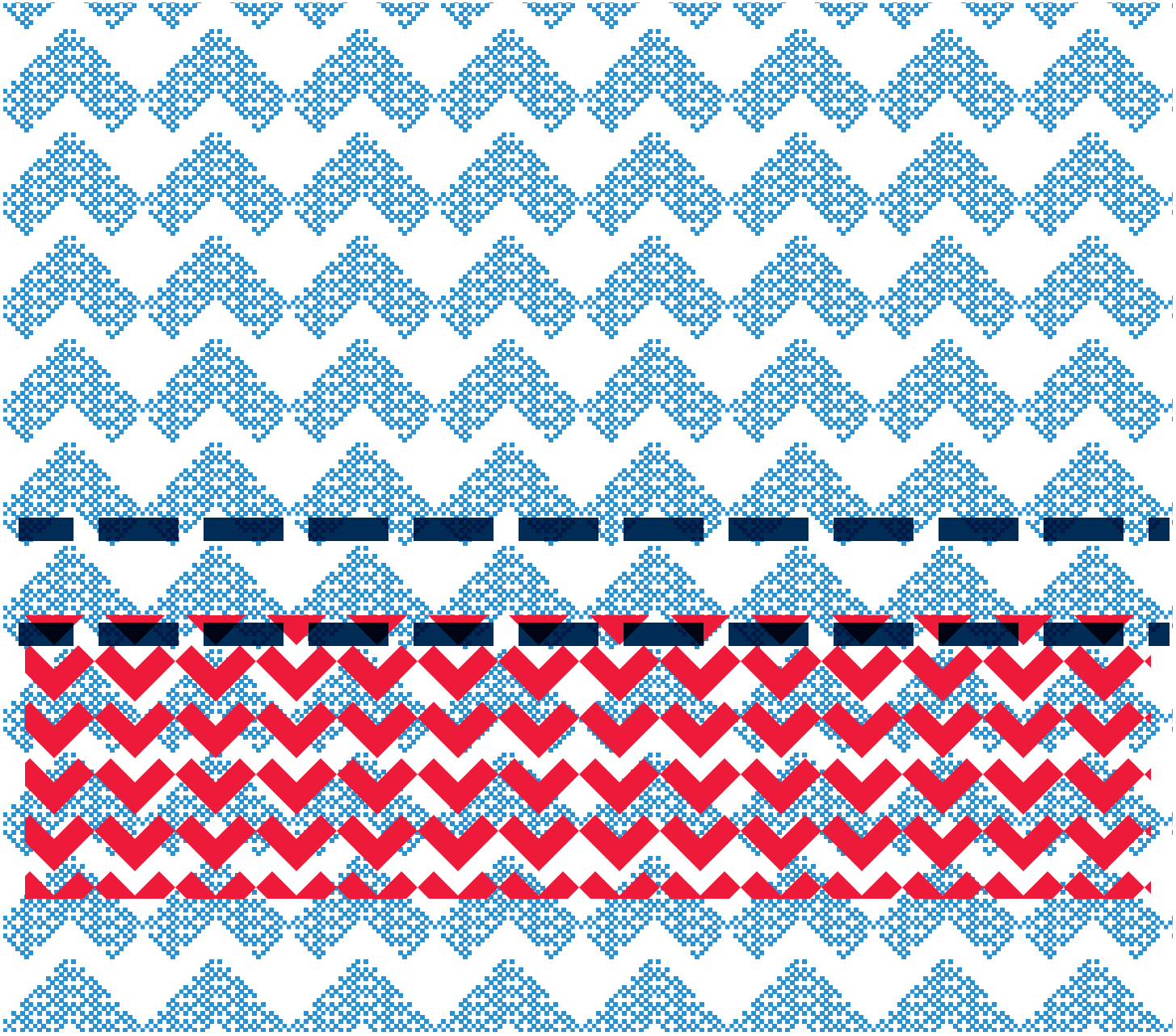
Manufacturing sector competitiveness does not only rely on the company that places a final product on the market, as it is also very important the efficiency of the whole value chain that involves many companies. All these enterprises have close relationships which will be even

closer as less standardized the involved intermediate products will be. These relationships can be enhanced:

a) **Joint product and services development projects**. Participation in product and services development projects with other companies from the same or different sectors makes easier to find out complementarities and potential synergies among different companies.

b) **Dissemination of good practices**. Cases of success as well as failure ones should be used to reduce the costs of learning by emulating good practices and avoiding those that have proven to be inefficient.

c) **Promotion of intra- and inter-sectorial relationships**. It is an area in which business associations have a lot of work to do, e.g., by organizing formal and informal meetings to promote mutual understanding and to discover new opportunities for collaboration.



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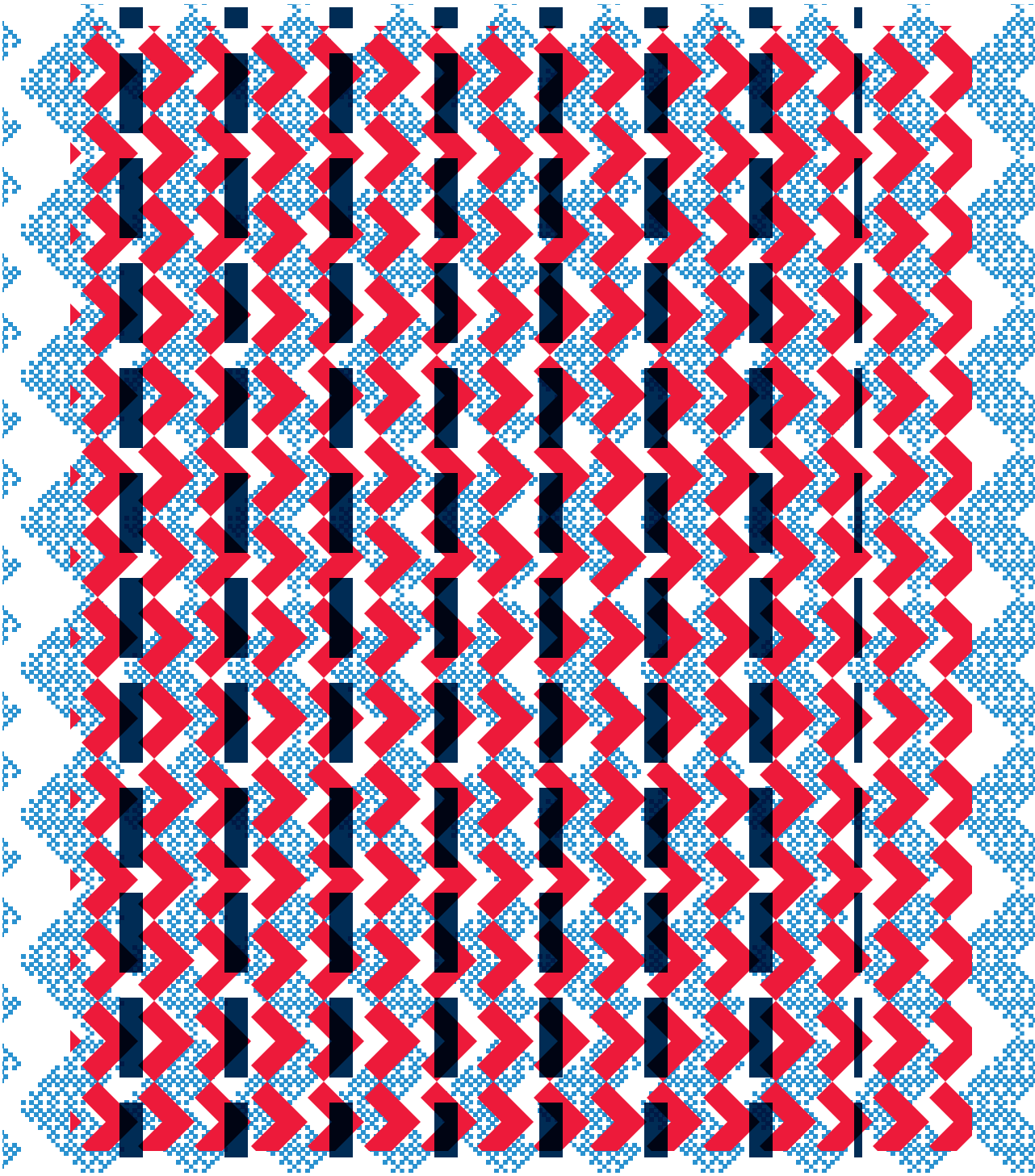

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