Gains from Trade. Is Comparative Advantage the Ideology of the Comparatively Advantaged?

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Abstract. The topic of gains from trade is central in mainstream international trade theory, and is almost all about comparative advantages. However, main-stream trade theory has a serious drawback, since it focuses on trade in final goods, hence disregarding trade in intermediates. Besides representing the great majority of international exchanges, trade in intermediates is the source of an extremely relevant phenomenon which is has been deepening in latest years, i.e. international division of labour, which is shaping the structure and evolution of global value chains.

Far from being determined by technological differentials, as traditional theory states, international division of labour is rather driven by wage, and labour standards and conditions in general, differentials. This is specially apparent in Europe, where eastward enlargement of the EU widened core countries' range of off-shoring opportunities. In particular, in recent years—and more markedly after the introduction of the Hartz Reforms—Germany could take advantage of EU enlargement to keep the "head" of production chains at home and off-shore the most labour intensive stages of production to Eastern Europe countries. This allows to keep GDP—i.e. the value of final commodities produced—growing while reducing the quantity of national labour employed. Incidentally, this leads to an increase in national labour productivity which has nothing to do with technological progress, but only with exploitation of "arbitrage" possibilities. Moreover, since intermediate production stages off-shored to peripheral countries are totally determined by production decisions taken in the core country, the latter acquires the power to dictate the terms of political and social struggle in peripheral countries. In other words, after the fall of the Wall and the dissolution of USSR, capital has been reorganising and reshaping by leading international division of labour.

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1. Introduction

The topic of gains from trade is central in mainstream international trade theory, and is almost all about comparative advantages. However, main-stream trade theory has a serious drawback, since it focuses on trade in final goods, hence disregarding trade in intermediates. Besides representing the great majority of international exchanges, trade in intermediates is the source of an extremely relevant phenomenon which is has been deepening in latest years, i.e. international division of labour, which is shaping the structure and evolution of global value chains.

Far from being determined by technological differentials, as traditional theory states, international division of labour is rather driven by wage, and labour standards and conditions in general, differentials. This is specially apparent in Europe, where eastward enlargement of the EU widened core countries' range of off-shoring opportunities. In particular, in recent years—and more markedly after the introduction of the Hartz Reforms—Germany could take advantage of EU enlargement to keep the "head" of production chains at home and off-shore the most labour intensive stages of production to Eastern Europe countries. This allows to keep GDP—i.e. the value of final commodities produced—growing while reducing the quantity of national labour employed. Incidentally, this leads to an increase in national labour productivity which has nothing to do with technological progress, but only with exploitation of "arbitrage" possibilities. Moreover, since intermediate production stages off-shored to peripheral countries are totally determined by production decisions taken in the core country, the latter acquires the power to dictate the terms of political and social struggle in peripheral countries. In other words, after the fall of the Wall and the dissolution of USSR, capital has been reorganising and reshaping by leading international division of labour.

The paper is organised as follows. Section 2 provides some broad descriptive statistics about the evolution of trade in intermediates, with a specific focus on the EU. Section 3 describes the evolution of the main EU automotive chains over the same period (1995-2011). Section 4 finally concentrates on German automotive production chain, analysing the evolution through time of its geographical composition.

2. The evolution of trade in intemediates

As shown by Figure 1 and Table 1, trade in intermediate represented in 1995 the majority of international trade both in the world general and in the EU in particular, the percentage being higher in the former case than in the latter (62.1% vs 58.9%). The share of trade in intermediates out of total international trade increased in both cases over the period considered, though it grew more in the whole world than in the EU only: in 2011, the percentage share of intermediate to total trade was 66.8% in the whole world, 62.6% in the EU only.

Figure 1 shows figures at current and constant prices. Looking at these figures, it emerges that trade in intermediates grew more at current rather than at constant prices, showing that the increase in price levels played a role. Such an increase seems to be higher in the case of the world in general, which might be due both to a different composition of intermediates exchanged and to the fact that this kind of trade has a higher weight than in the case of the EU only.

Looking at volumes, i.e. figures at constant prices, we can see that overall international trade was been characterised, in the period under consideration, by a positive growth that accelerated after 2002, dropped dramatically in 2009 and then accelerated again the following year. This holds true for both final and intermediate trade. In the case of the EU the trend is similar, but shows some specificities. First of all, recovery was slower, and took one more year to deploy fully. Secondly, after 2005 trade in intermediates started growing much faster than final trade. When looking at the value of trade, i.e. figures at current prices, a first difference with the previous case is immediately apparent, i.e. the increase of trade in both intermediate and final goods was much sharper in the years before the crisis, signaling an acceleration in price level increases. In the case of the whole world, this difference with respect to volumes is even more relevant, since in makes the value of trade in intermediates to increase much faster that that of final trade since 2003.

Figure 2 ranks productive sectors according to their weight in gross production in 2011. As we can see, there is only one manufacturing sectors in the first five position—namely *Basic and Fabricated Metals*; the top places in the rank are services—*Renting of Machinery and Equipment*, *Financial Intermediation* and *Wholesale Trade*.

Figure 3 shows that, when turning to sectors' weight in intermediate trade, the pictures of course changes. In this case, the ranking is led by manufacturing sectors: *Basic and Fabri-*

cated Metals, *Chemicals and Chemical Products*, *Electrical and Optical Equipment* and *Transport Equipment*. Overall, the manufacturing sectors which have been following, over the period considered, a growing trend are *Electrical and Optical Equipment*, *Coke and Refined Petroleum*, and *Rubber and Plastics*.

Figure 4 focuses on EU only. The picture is similar to that emerging from Figure 3 with the difference that the weigth in intermediate trade of the four manufactiring sectors ranking at the top is on average 1 p.p. higher, and that *Transport Equipment* is more relevant than *Electrical and Optical Equipment*. It is interesting to see, in both cases, a decline in the weight of traditional sectors such as *Other non Metallic Minerals*, *Wood and Wood Products*, *Textiles* and *Manufacturing Nec*.

Figure 5 summarises these results by comparing the ranking of sectors in 1995 and 2011.

3. Automotive sector

In what follows, I shall concentrate on the automotive sector, and more specifically, to German automotive sector.

First of all, it is worth pointing out that, in the present paper, the terms 'industry' and 'sector' have two distinct meanings. The second, in fact, is going to be used to intend 'subsystem' (Sraffa, 1960) or 'vertically integrated sectors' (Pasinetti, 1973). In other words, the term 'sector' will be used to identify the whole global production chain associated to the production of one specific set of final commodities by the specific country which is at the head of the chain itself. Hence, when talking about, e.g., German automotive sector, we will take into account all the network of direct and indirect inter-industry flows taking place between any industry, located in any country of the system. This will allow to trace back all transactions triggered by final production of *Transport Equipment* in Germany, in order to find out the evolution of international division of labour in this specific production chain.

Before going to analyse German automotive production chain, Figure 6 provides some descriptive statistics of automotive production in the EU.

From the point of view of final goods production, it is apparent that in 2011 Germany plays a predominant role: the 45% of EU final automotive production was realised in Germany.

The other countries lag behind: UK and France are only slightly above 10%; Spain produces about 8% of total EU final output, and Italy about 6%. In other words, summing up poduction of

these four countries is less than Germany's.

It is also interesting to stress the dynamics of automotive final production over time: Germany's production increased by 10 p.p., from 35% of 1995 to 45% of 2011.

Conversely, Italy, Spain, France and UK underwent a decrease in their participation to EU final production, albeit due to different causes and to different extents.

In the case of Italy, it continuously decreased over the whole period considered, from 13,5% in 1995 to 6% in 2011.

In Spain, it dropped from 10 % in 1995 to 8% in 1996, and then starting increasing to go beyond 11% in 2000. This positive peack was then followed by a 3 p.p. drop, which makes Spainsh weight in EU final production go back to 1996 level.

France, starting from 20% in 1995, saw a negative trend until 2007 (below 17%). In 2008 there is a sudden increase by about 4 p.p., reaching about 23%, followed by a sharp drop that—in two years—brings its weight down to 10%.

The above mentioned trends can be compared to data collected by OICA,[2] highlighting that, between 1999 and 2011, the production of cars and commercial vehicles went from 5.6 to 6.1 millions in Germany; from 3.1 to 2.2 millions in France; from 2.8 to 2.3 in Spain; and from 1.9 to 1.4 in UK. The most dramatic reduction took place in Italy, whose production declined that declines from 1.7 millions to 790.000.

Going back to Figure 6 and looking at Central-Eastern Europe, we can stress that the share in EU final production significantly increased in Poland and Czech Republic (from about 1.5% to about 4%). In Slovakia, Hungary and Romania, it increased from about 0% to almost 1%.

For Central Eastern Europe, OICA highlights that the overall production of cars and commercial vehicles in the period 1999-2011 went from 574.000 to 838.000 in Poland; from 376.000 to 1.2 millions in Czech Republic; from 126.000 to 639.000 in Slovakia; from 106.000 to 335.000 in Romania; and from 128.000 to 213.000 in Hungary.

Also in the case of intemediates, in 2011 the lion's share is Germany's (35%), followed by France (15%), Italy (almost 10%), and Spain and UK (about 7%).

Looking at the evolution through time of these figures, we can see that German share of EU

[2]Organisation Internationale des Constructeurs d'Automobiles.

intermediate production for the automotive sector increased over the time period considered, while it is decreasinf for all other countries mentioned above. Also in this case, the drop in French weight is concentrated between 2008 and 2010, and the Italian case is the most dramatic of all.

The weight of Czech Republic and Poland underwent a positive trend as in the case of final goods; it increase also in the case of Slovachia, Romania and Hungary, although with an oscillating trend in the latter case.

4. German automotive sector

Figure 8 shows the percentage share of EU countries in the production of intermediates directly and indirectly employed by German automotive sector. Of course, all figures are influenced by the effects of the crisis, which made international trade in general to decline for a couple of years. However, considering this special event, there are some tendencies which clearly emerge from examination of the Figure.

First of all, there is a constant and sharp decline of Germany's contribution to its own automotive chain: looking at current prices, this share was almost 72% in 1995 and reached 62.5% in 2011. Secondly, France and Italy are the two EU countries, besides Germany itself, contributing the most to this sector in terms of intermediates. However, while the participation of France was very variable over the whole period but did not undergo a relevant change from 1995 to 2011 (5.75% and 6%, respectively), Italy followed an increasing, though not particularly sharp, trend, from 4.25% in 1995 to 5% in 2011. The trend, on the contrary, is slightly decreasing in constant prices, which might suggest a change in the composition of Italian intermediate direct and indirect exports.

Thirdly, Poland, Czech Republic and Hungary sharply and almost continuously increased their participation to German automotive sector over the period considered: from 1% to 3% in the case of Poland; from 1% to 2.75% for Czech Republic; and, finally, from 0.5% to almost 2% for Hungary.

The participation of Austria, Netherlands and, to a lesser extent, Belgium, in their turn, decreased from 1995 to the beginning of the years 2000 (2001, 2000 and 2003, respectively) and start increasing. Overall, in 2011 Austria's weight was higher than in 1995 (almost 2.9% and 3.25%, respectively). The same holds for Netherland, whose weight in current prices was 2.3% in

1995, and more than 2.6% in 2011. In the case of Belgium, the share was higher in the first than in the last year of the period: 2.4% and 2%, respectively.

Also Slovakia, Slovenia and Romania increased their participation, but always counting less than 1% of total intermediates exchanged at the EU level.

4.1. Labour productivity

The usual story told about German trade surpluses is that Germany has a higher productivity than other, especially peripheral, countries, and that its productivity grows faster than in the rest of Europe. In particular, Germany could increase its productivity thanks to, among other things, the flexibilisation of its labour market, made possible by the introduction of the so called Hartz Reforms between 2003 and 2005. The argument has been then taken to push towards the introduction of similar labour market reforms in the rest of EU countries—which was actually done, e.g., by Italy, Spain and France.

It is therefore interesting to have a closer look to the evolution of German labour productivity in the automotive sector, with a specific focus on the period after Hartz Reforms were implemented.

Figure 9 shows labour productivity growth computed in three ways. The first one is national labour productivity at the industry level, i.e. the ratio of *gross* in the automotive industry output to hours worked. The second is national productivity at the subsystem level, i.e. the ratio of *net* output of the automotive sector to the total number of hours worked in the subsystem as a whole. The latter is international productivity, which of course makes sense at the subsystem level only, where by subsystem here we mean the whole global production chain. The time period is 1996-2009 only, which is the only period for which we have constant prices data.

In general, Figure 9 shows that national productivity almost always grows faster when computed at the industry level. However, there is no sign that Hartz Reforms made German productivity to accelerate in the automotive sector. In fact, productivity sharply increased in 2003 with respect to 2002, and kept growing in the following years up to 2007, but the trend is not different from that prevailing in the 1996-2002 period.

When we look at national productivity from the subsystem point of view, we see that it is always growing less—or decreasing more—than in the previous case, the only exceptions being 2003 and 2004.

International productivity, in its turn, is almost always the least growing one. In five years before the crisis (1998-1999, 2002-2004) it was even decreasing. This suggests that Germany offshored the most labour intensive stages of production to countries characterised by a lower wage level. This makes it possible to shrink production costs by taking advantage of wage differentials—hence improving competitiveness—while keeping productivity growing at home. Moreover, increasing competitiveness means increasing exports, and hence to reduce dependency on domestic wages. This massive offshoring was eased by at least three phenomena: (i) Hartz Reforms, which have made it easier to dismiss workers or employ them on a less than full time basis (think of minijobs); (ii) The EU eastward enlargement, which extended freedom of enterprise and of movement of capitals to low-wages countries; (iii) The diffusion of new ICT technologies which make transport costs and just-in-time production cheaper and easy to fine-tune, also by changing its geographical composition. It is not a case that what is now known as *Industry 4.0* is a strategic initiative put forward by the German Government, aimed at supporting the diffusion of this kind of technologies (Forschungsunion and Acatech, 2011).

Figures 10 to 13 can shed some light on the phenomenon described above, i.e. on the fact that international division of labour is not driven by technological differentials, but rather by wage and other cost differentials. More specifically, the Figures show—for the years 1996, 2000, 2007 and 2009—the contribution of each country to increase or decrease German productivitity in the automotive sector. Countries are ranked in decreasing order according to their contribution to productivity growth, and the colun above each country r represents the cumulative sum of the contributions of countries 1 to r. The shaded line therefore corresponds to the cumulative sum of all countries' contribution, and hence to total productivity growth for that year.

Figure 10 depicts the composition of productivity growth in 1996. The contribution of Germany only is positive and equal to 2 p.p. India, UK, US and Spain give a positive contribution of at least 0.5 p.p. The rest of countries with dark green columns give positive but close to zero contributions; parallely, countries with red lines ranging from Cyprus to Brasil give negative but close to zero contributions. Finally China, Poland and Russia give a negative contribution of at least 0.5 p.p. Overall, the rate of growth of productivity with respect to 1995 was 3%. We can notice that Hungary, Belgium, Austria and Netherlands are among countries giving a positive—though very small—contribution; the opposite holds for Cezch Republic, Poland and, most notably, China.

In 2000 the picture, as shown by Figure 11, is slightly different. German contribution is positive in this case as well. Brasil, Poland and India give positive contributions around 1 p.p., while the positive contribution of other countries is closer to zero. Among these we find Austria. On the negative side, China decreases German productivity by about 1.5 p.p. Czech Republic, Belgium, Netherlands and Hungary are on the negative side too. Overall, the rate of growth is 2.25%.

Figure 12 shows the situation the year before the breakthrough of the crisis. China is the country giving the most relevant contribution to productivity growth (2 p.p.) followed by Germany (0.8 p.p.). Czech Republic, Hungary and Poland are all on the negative side, hence decreasing German productivity with their participation to the automotive chain. Overall, the rate of grwoth of productivity is 3.25%.

Finally, Figure 13 shows the geographical distribution of productivity growth in 2009. Here, the only countries giving a positive though close to zero contribution are Germany, Poland, Romania, Turkey, Hungary, Luxemburg, UK and Slovenia. All other countries give a negative contribution, and in fact the overall rate of growth of productivity in 2009 is negative (almost -6%). China, India, Russia and Brasil are the countries contributing the most to this negative trend.

5. Tables and figures

Table 1: Evolution of international trade, 1995-2011, Current prices, % shares

World

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Var p.p.
Final	37.9	37.8	37.3	39.1	38.8	37.0	37.7	38.3	37.7	35.6	34.7	33.9	33.8	32.9	35.2	34.1	33.2	-4.7
Intermediate	62.1	62.2	62.7	60.9	61.2	63.0	62.3	61.7	62.3	64.4	65.3	66.1	66.2	67.1	64.8	65.9	66.8	+4.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	

EU

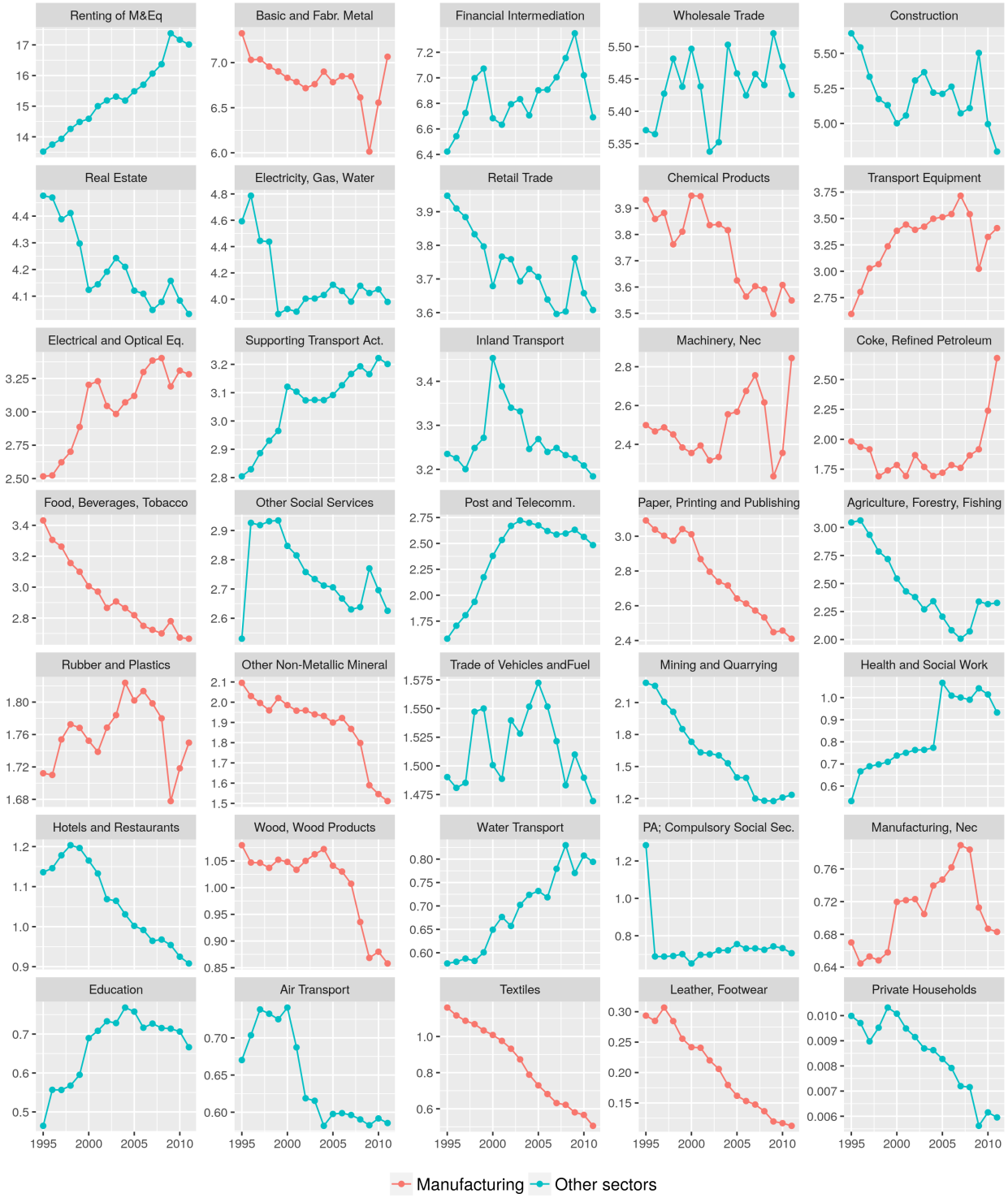
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Var p.p.
Final	41.1	41.6	41.4	42.2	42.5	40.8	41.2	42.2	41.8	40.5	40.1	38.9	38.5	37.7	39.2	38.6	37.4	-3.7
Intermediate	58.9	58.4	58.6	57.8	57.5	59.2	58.8	57.8	58.2	59.5	59.9	61.1	61.5	62.3	60.8	61.4	62.6	+3.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	

Source: Own elaborations based on WIOD, 2013 Edition

Figure 1: Evolution of international trade, 1995-2011

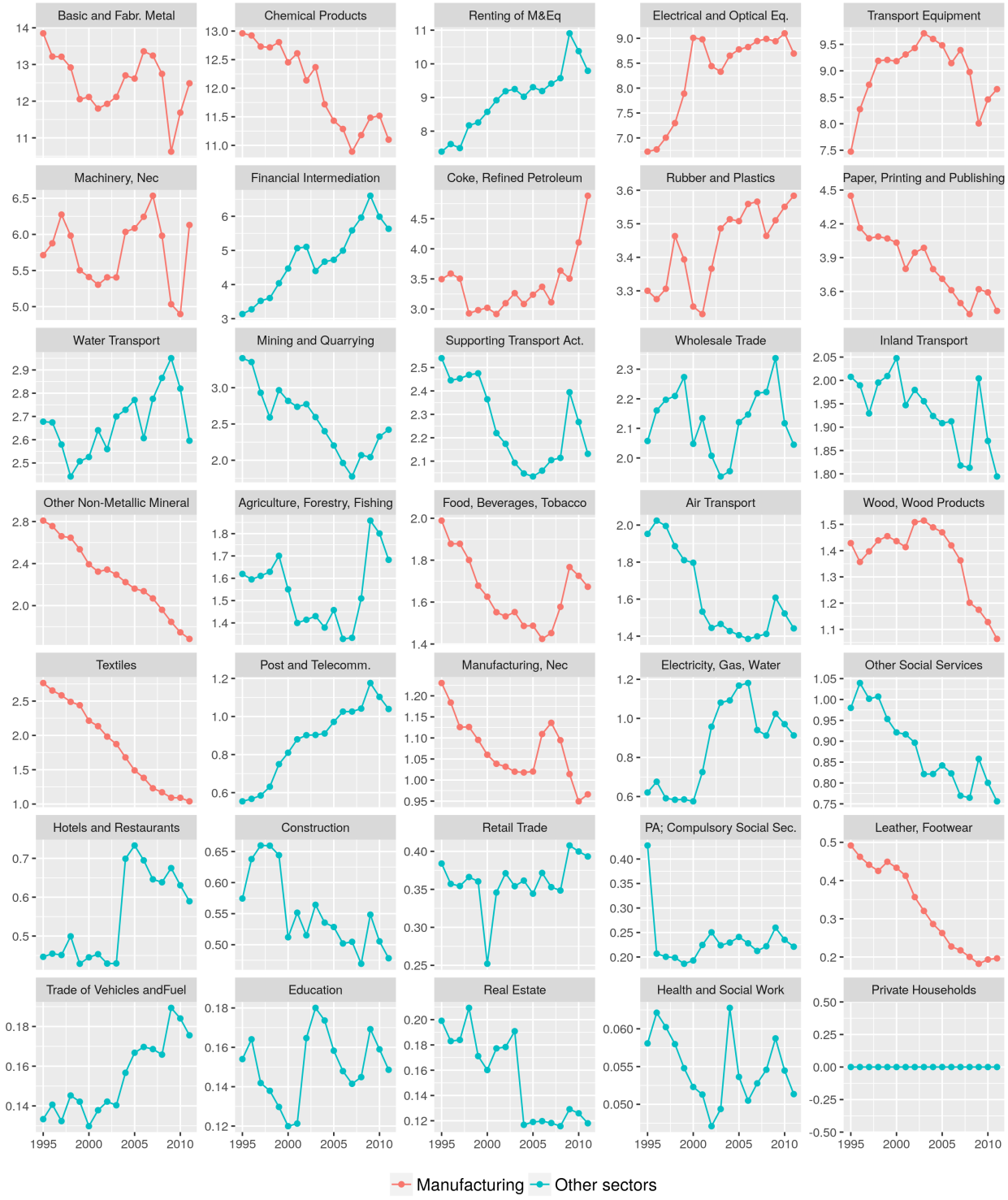
Source: Own computations based on WIOD, 2013 Edition

Figure 2: Ranking of sectors in the EU, gross production, constant prices 2009



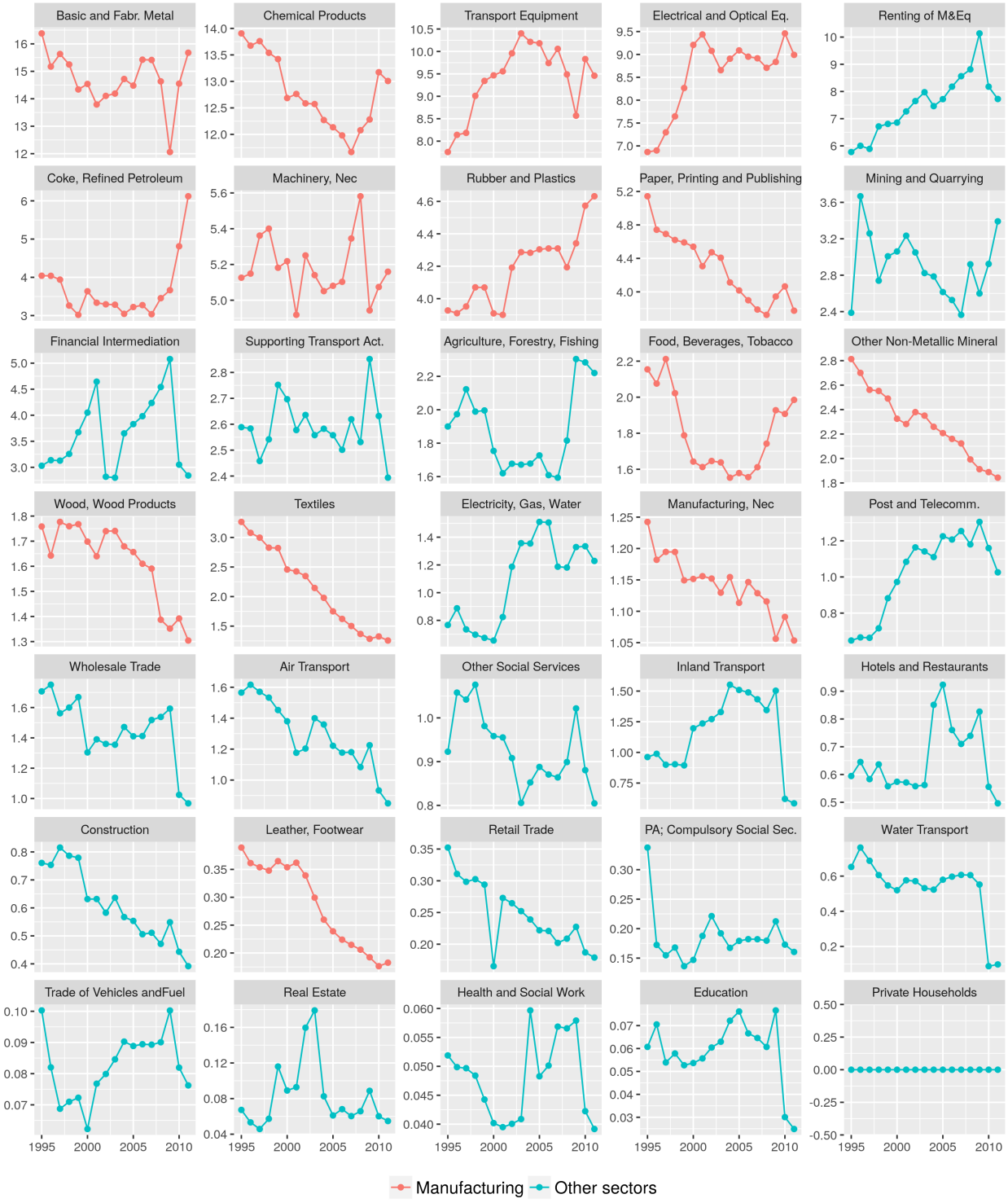
Source: Own computations based on WIOD, 2013 Edition

Figure 3: Ranking of sectors, intermediate trade, constant prices 2009



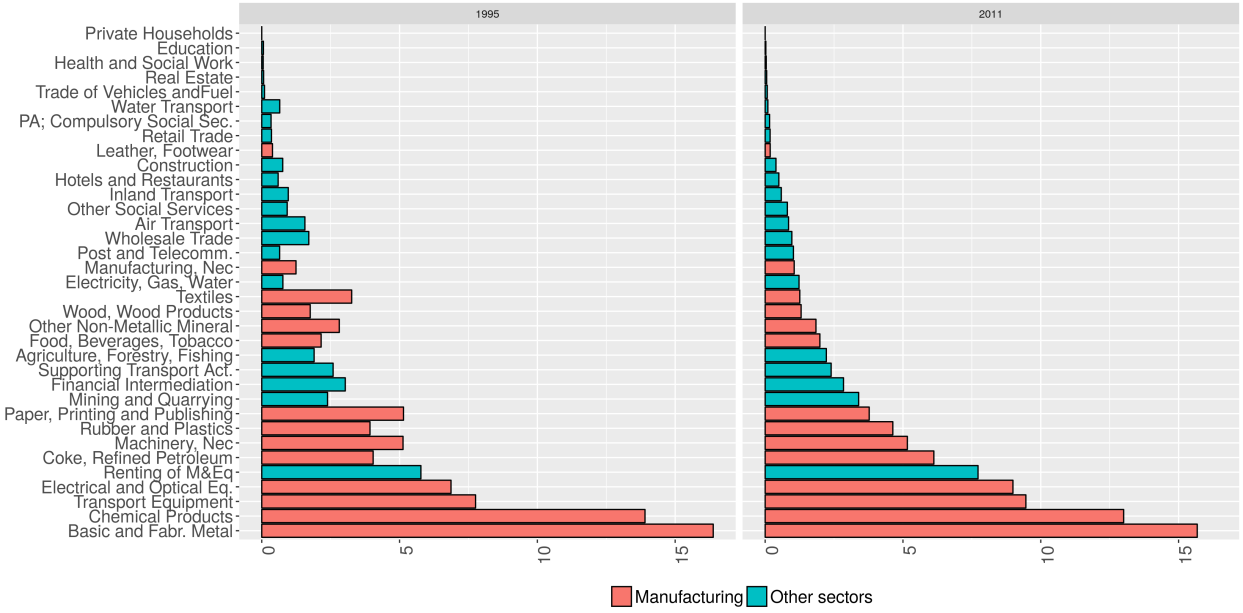
Source: Own computations based on WIOD, 2013 Edition

Figure 4: Ranking of sectors, intermediate exports within EU, constant prices 2009



Source: Own computations based on WIOD, 2013 Edition

Figure 5: Ranking of sectors, intermediate exports within EU, 1995 and 2011



Source: Own computations based on WIOD, 2013 Edition

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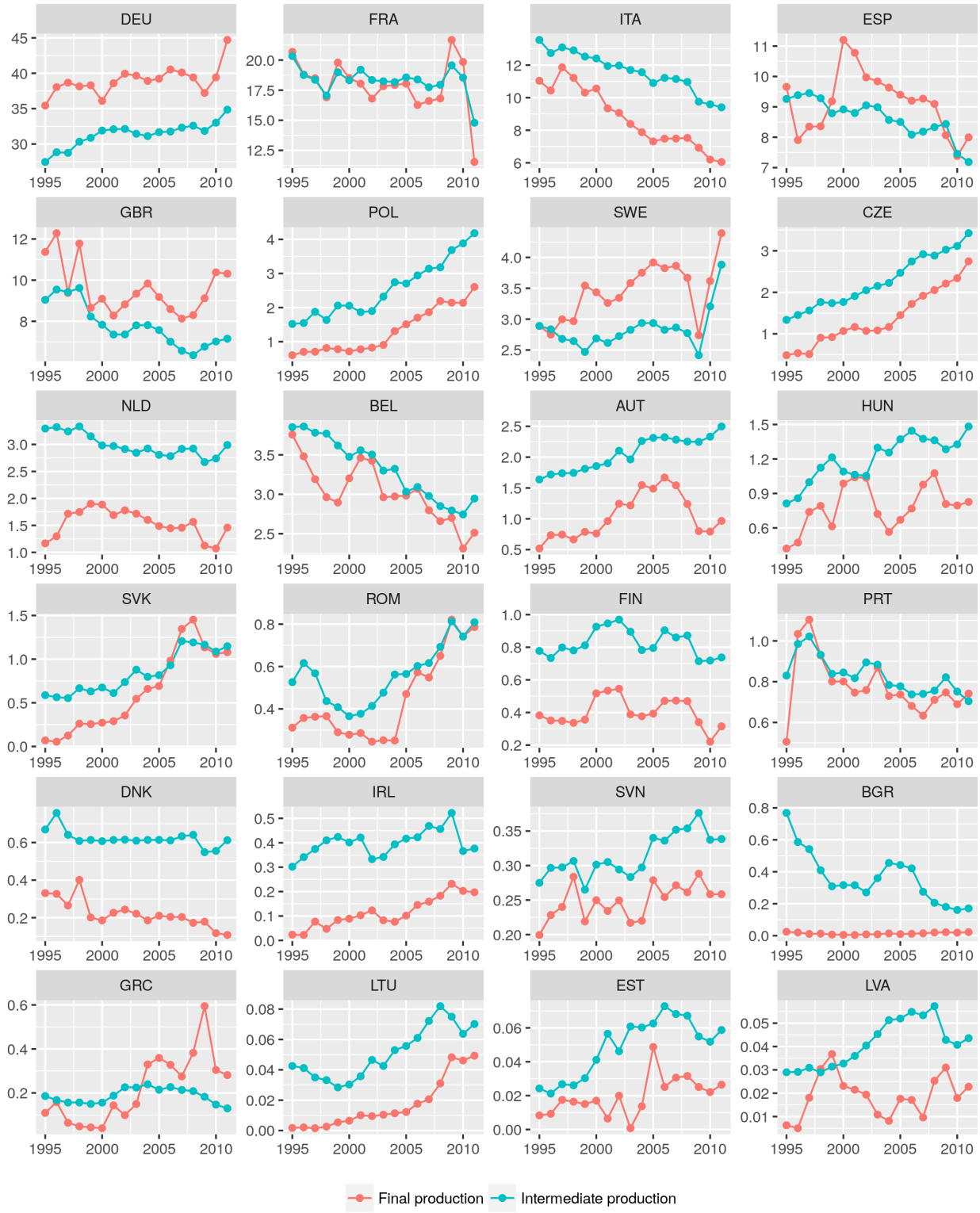
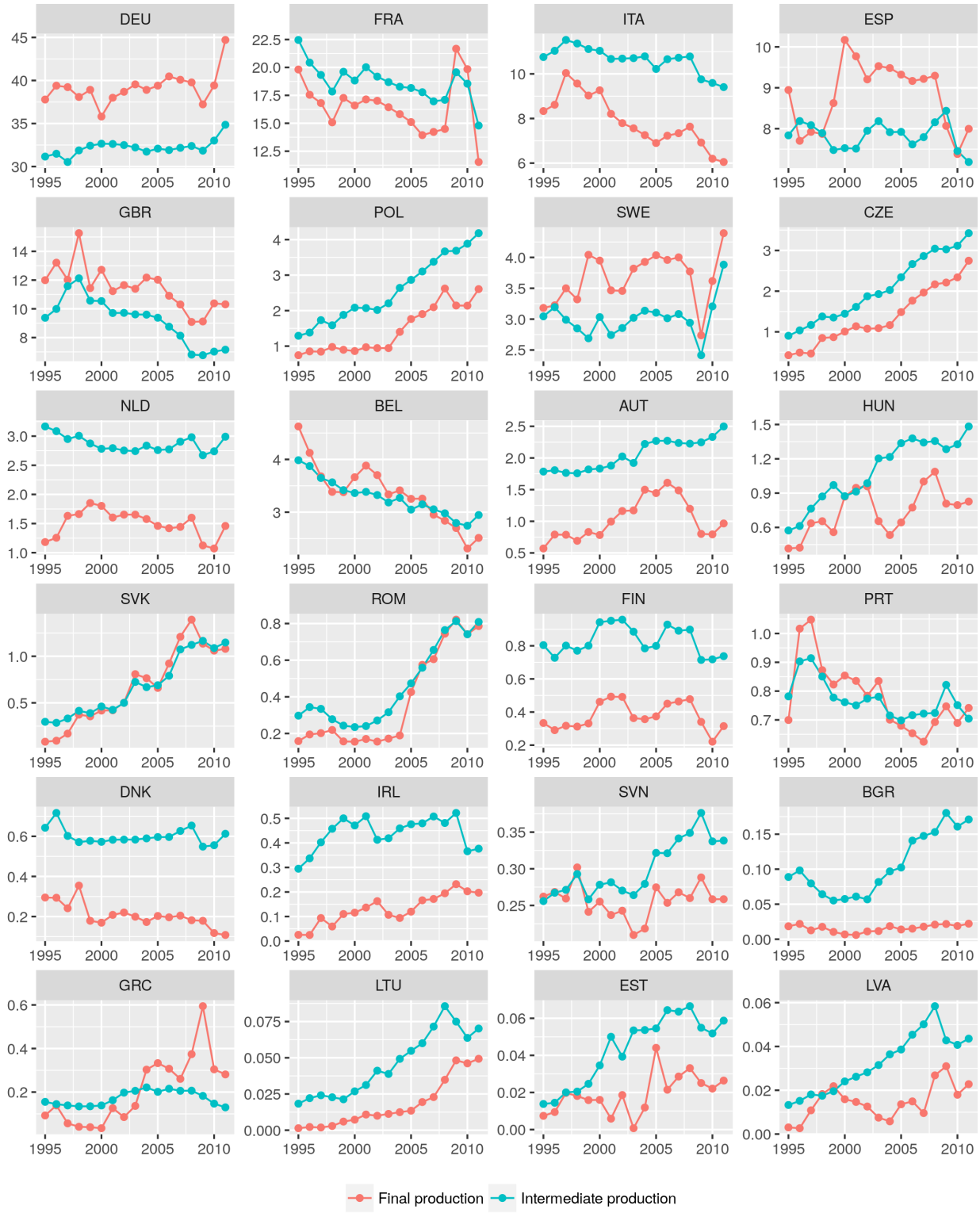
Figure 6: % Distribution of final and intermediate production of automotive sector in the EU, Constant prices (1995-2011)



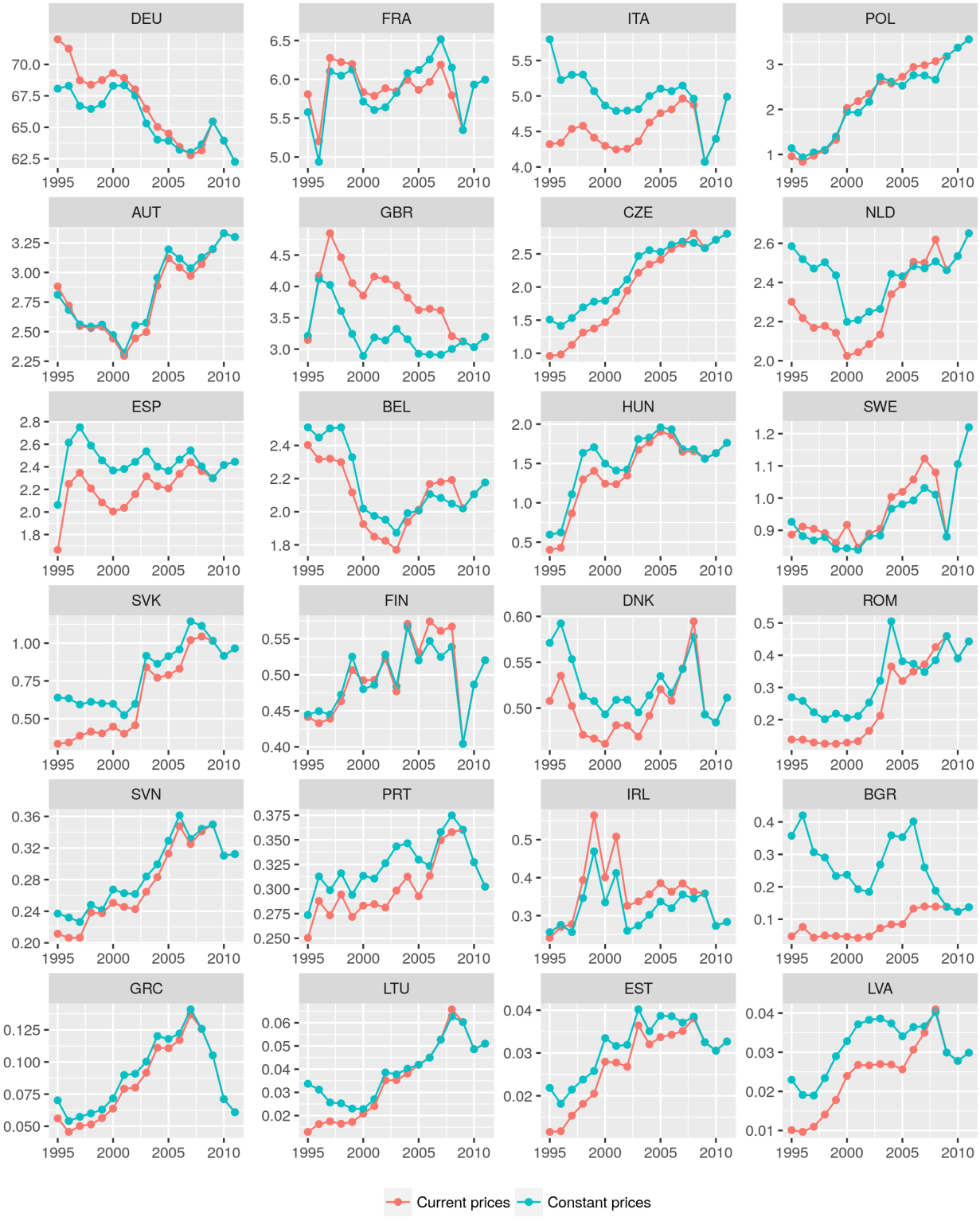
Source: Own computations based on WIOD, 2013 Edition

Figure 7: % Distribution of final and intermediate production of automotive sector in the EU, Current prices (1995-2011)



Source: Own computations based on WIOD, 2013 Edition

Figure 8: Distribution of intermediate production for German automotive sector, Current prices (1995-2011)



Source: Own computations based on WIOD, 2013 Edition

Figure 9: Evolution of labour productivity, Germany (1995-2011)

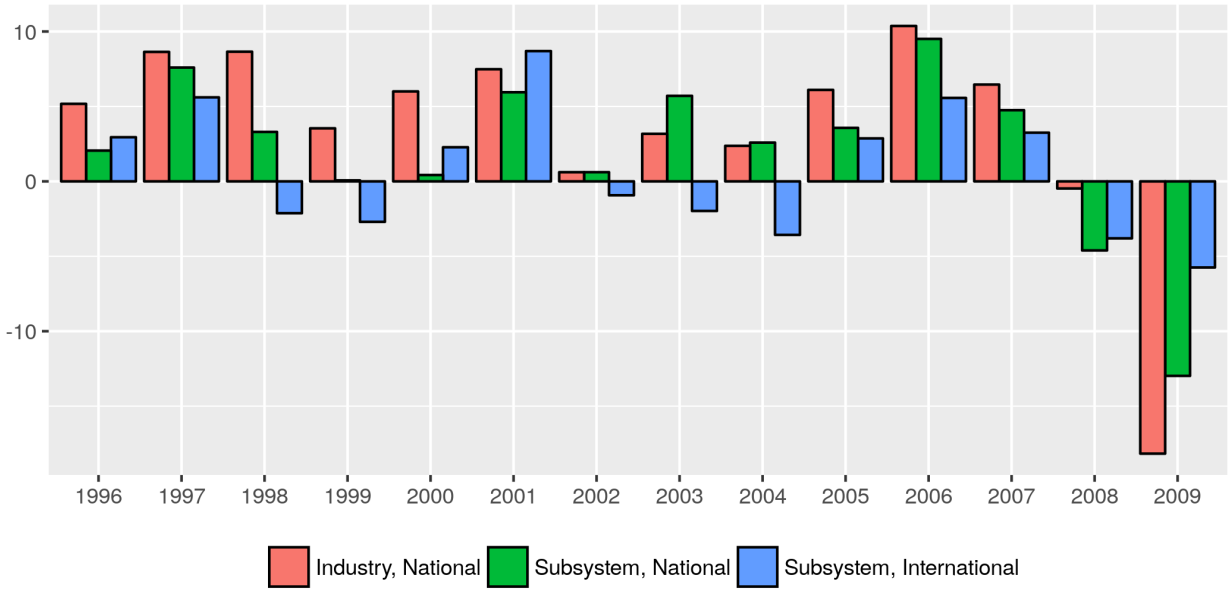


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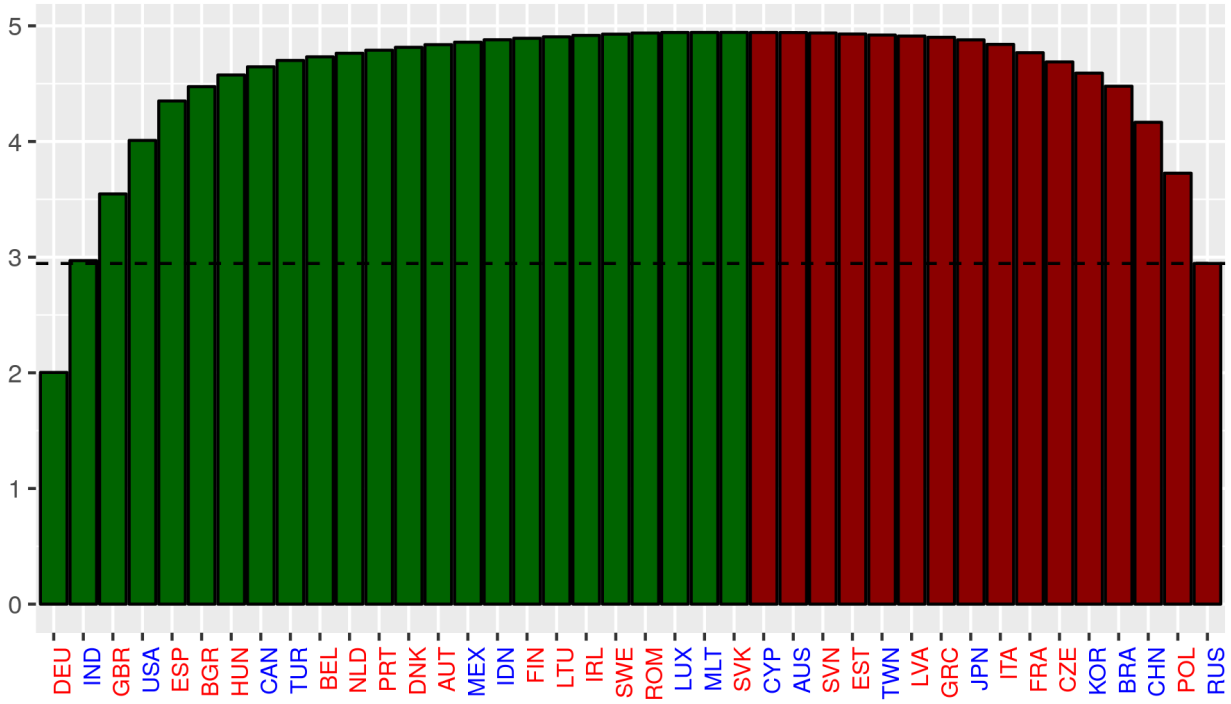
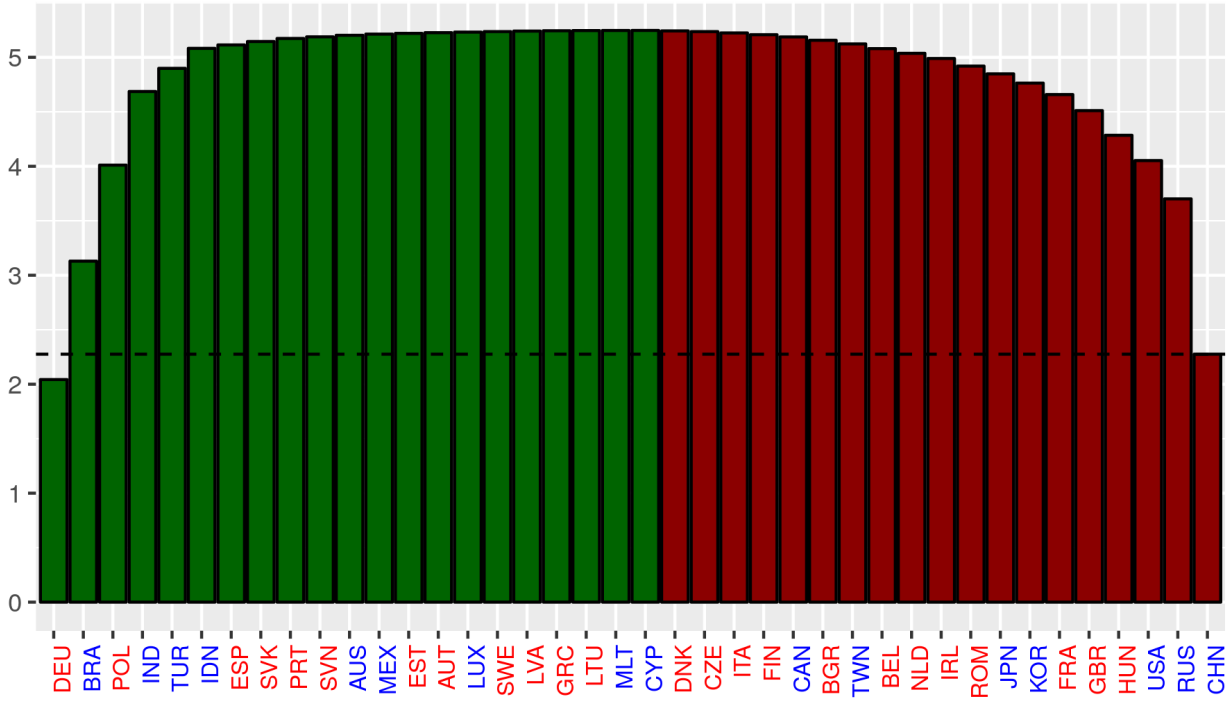
Figure 10: Geographical contibution to productivity growth, German automotive sector, 1996



Source: Own computations based on WIOD, 2013 Edition

Figure 11: Geographical contibution to productivity growth, German automotive sector, 2000



Source: Own computations based on WIOD, 2013 Edition

Figure 12: Geographical contibution to productivity growth, German automotive sector, 2007

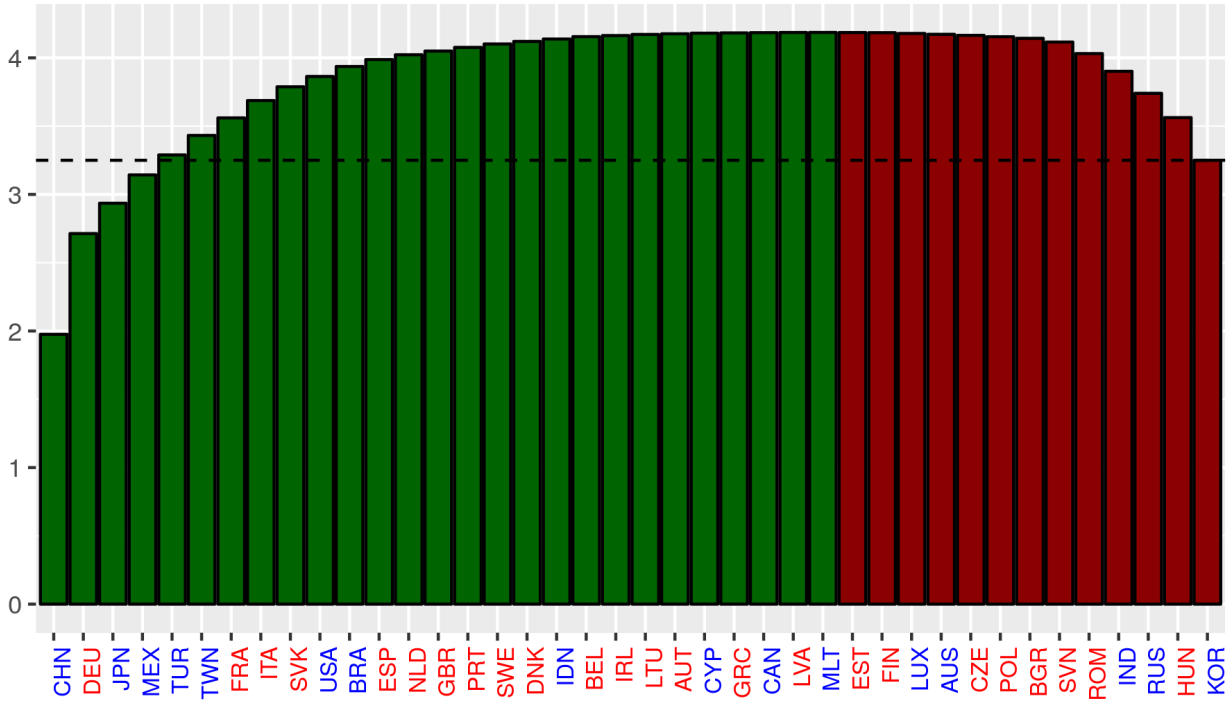


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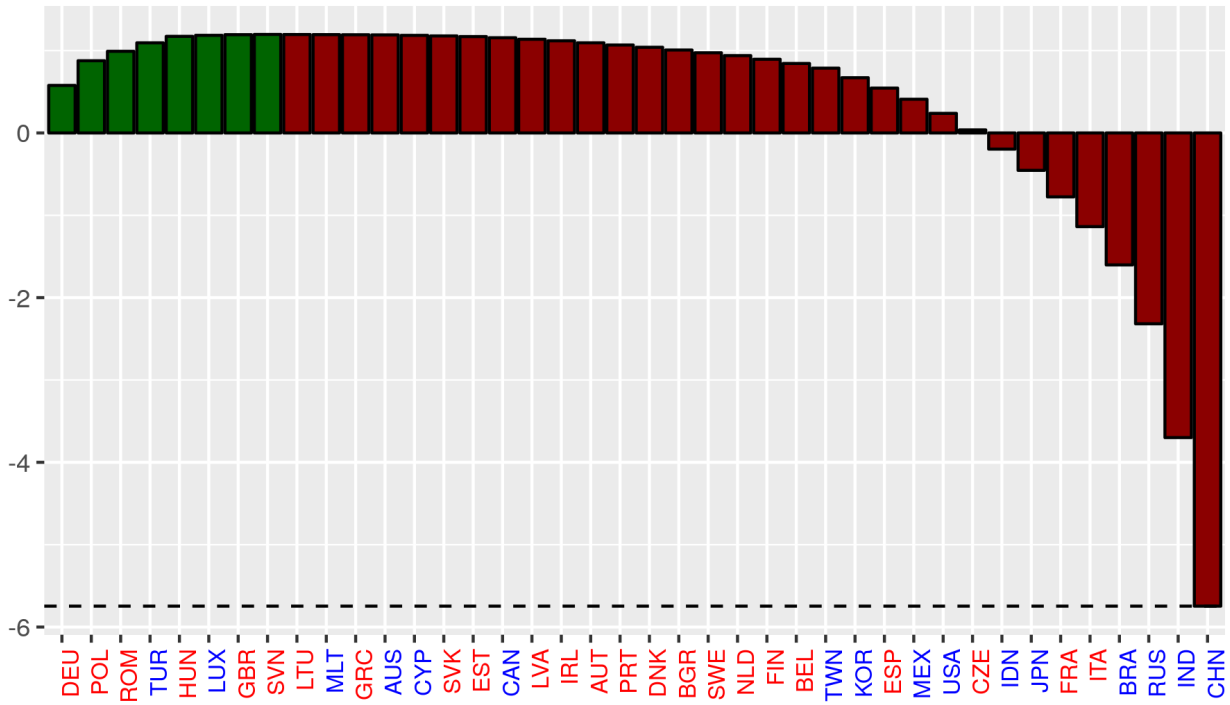
Figure 13: Geographical contibution to productivity growth, German automotive sector, 2009



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