

New European economic geography: the case of the automobile industry

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Introduction

* Why does this paper pay a particular attention to the automobile sector? First, because of its size in Europe: the automobile branch accounts for 3% of the European GDP and 7.5% of the industrial production. Furthermore, in 2002 in Germany, where the car industry belongs to its outmost specializations, the sector weighed 21% of the country's total exports, 18% of its sales and it employed 13% of its labour force; a similar picture applies to France. On Central and Eastern Europe's side, here restrained to countries that produce cars, namely Poland, the Czech R., Slovakia, Hungary, Slovenia and Romania, the automobile sector has been one of the important driving forces of the industrial reorganization of these countries, in particular due to the large number of employments it has created, directly but also through the investments induced in the upstreams, downstreams and related sectors (metals, plastics, logistics or financial services). In Slovakia, for example, the sector accounted for 25% of the industrial production in 2002 and, taking into account the growing new investments, it could reach 40% by 2010. The revival of the car industry in these countries has been carried out thanks to foreign direct investments (FDI).

* Why is "a new" economic geography mentioned? Planned investments point to an expected 3 M vehicle production by 2010. It could even become 3.5 M if rumours are confirmed and transformed into effective investments that some more Asian manufacturers (Daïhatsu and Mazda in particular) have a great interest in investing in the CEEC. This additional productive border overlapping pole in Europe, will not radically change the great production and consumption locations on a European scale: offer and demand could, in the long run, balance on a level ranging between 15% and 20% of total "enlarged Europe". The emergence of the Central and Eastern European automobile pole will rather stimulate a reorganisation of the economic geography of the sector on the European continent : demand and production conditions will grow in diversity and quantity.

* The analysis of trade and specialization patterns (geographical, by stage of production and by products), of these countries will allow to qualify this pole, around three series of questions.

- is it "autonomous" or integrated into the other European automobile producing countries in general, and Germany in particular? In other words, have these countries developed a vertical integration relation and assemble components they import into finished goods (vehicules) or do they integrate European productive processes more upstream, i.e. also export (and import) automotive components (intermediate goods)? Is this integration, homogeneous all over Europe or are there also geographical specializations?

- which product specializations have emerged in Central and Eastern Europe?

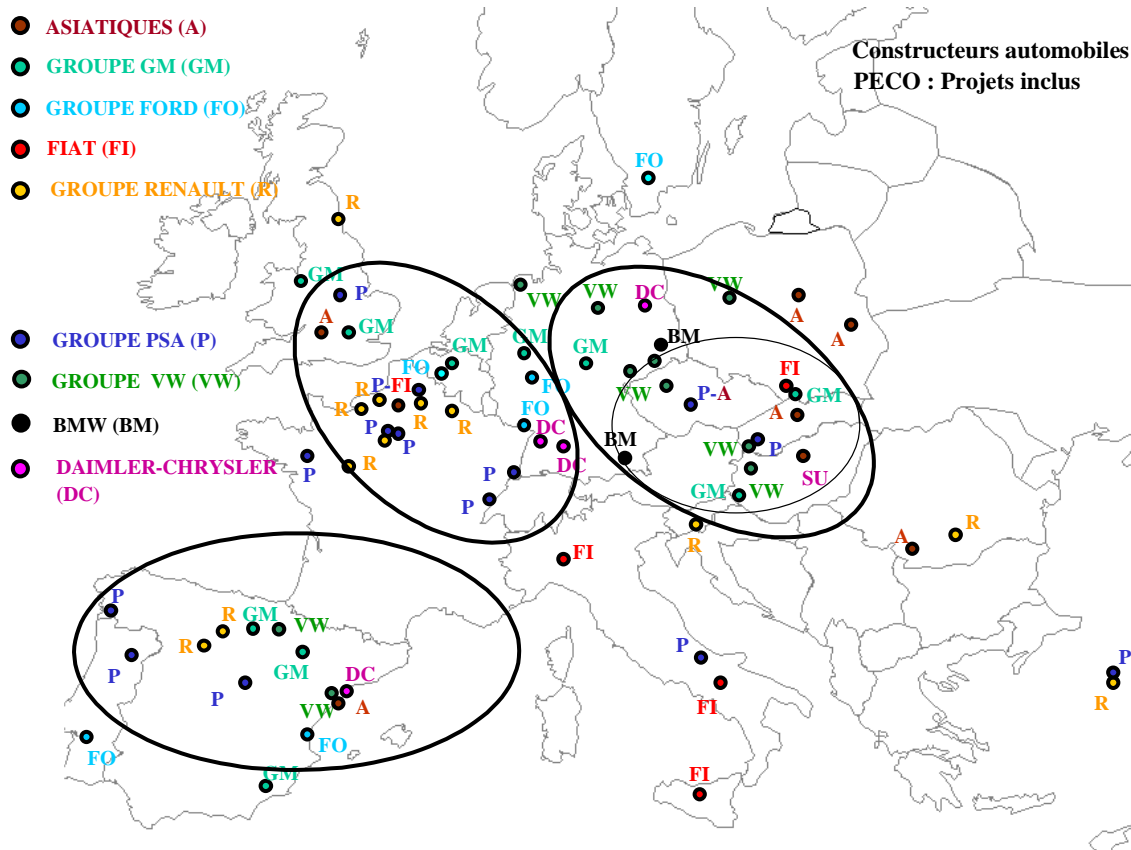
- which could be the adjustment cost for the automobile branch in former EU 15? Are they likely to be high? If indeed, Central and Eastern European producing countries are integrated

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into European productive processes, high levels of two way “horizontal” trade would imply lower adjustment costs for “traditional” locations than in case of “vertical” trade, being one way or two way. The latter would imply greater movements of production factors to the CEEC.

The map hereafter represents the structuration currently in progress of the European automobile sector.

Structuration of the European automobile industry in progress: the three great European « catchment areas »



Source : Boillot J-J. et Lepape Y (2004)

The first part of the paper describes changes in progress in the automobile industry which, according to observations, lead to the reinforcement of the role of scale economies. This would rather validate a reference to the theoretical framework of the “New theory of the international trade”. The second part examines, quantitatively, the geographical specialisation in Central and Eastern European countries’ trade, their integration into European productive processes and product specialisation. The third part evaluates the development of the intra-industry trade and their “vertical” or “horizontal” product differentiation. In conclusion, this research briefly describes how the European economic geography of the automotile sector is progressing according to the criteria of competition or complementarity between productive poles of the continent. Furthermore, if this new European economic geography relies on increasing intra-industry “horizontal” trade, the theoretical hypothesis of an increasing role of internal economies of scale in the European automotive industry would be reinforced.

I. Overall context in the automobile industry and theoretical framework

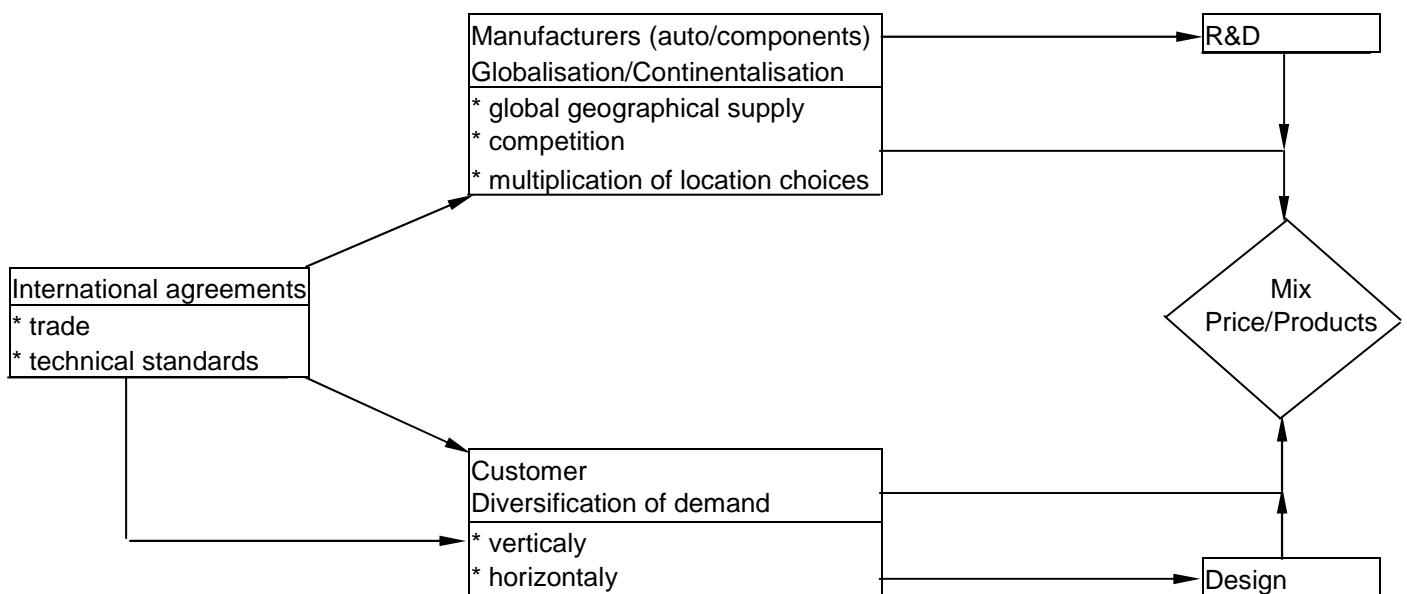
The main tendencies of globalisation and the changes in progress in the market structure of the automobile branch let expect that internal as well as external scale economies play a more and more important role, stimulating a specialisation process of the firms (and hence not only of the Nations).

1.1. Globalisation of market actors and continentalisation of the markets: impacts and constraints

* Some vehicle manufacturers are already regarded as global firms, at least the six or seven largest ones, according to the geography of their sales and location of production facilities. The process is still in progress. Nevertheless, these multinationals developed “continental” markets strategies, and not a unique one for the whole world², and this for at least two reasons:

- free trade areas on a continental scale have been created (EU, CEFTA, ALENA...), those regions often having each specific constraints and technical standards (CCFA-FIEV, 2004)³;
- demand is more homogeneous within these big areas than between them; demand is partly oriented by the agreed technical standards as the development of diesel motorisation in Europe shows.

From globalisation to price/product mix



Arrows represent the links described in the text

Source : Authors

* This continentalisation of the markets orients supply as well as demand⁴. For manufacturers and equipment suppliers, it first means a race to reach a critical size, and an increasingly global presence, i.e. in each of the large markets of the world. Then, as the size of

² The commercial failure of Ford's "Mondeo", a model indifferently designed for all markets, European, Asian and American, further reinforces the accuracy of such continental strategies.

³ For example concerning (greenhouse) gas emission and, more generally, motorization or the safety of passengers. These rules and standards, which are often associated to the multilateral agreements have a direct impact on demand.

⁴ For example, technical standards associated with active information from governments about pollution might impact global demand for diesel motorization.

“homogeneous” markets is becoming bigger, competition in general reinforces, pushing prices down. However, the continuous addition of equipment in vehicles allows manufacturers to preserve their pricing power. Lastly, these regions offer producers a broad variety of possible locations on the scale of wage costs, that spread in Europe, for example, from 1 to 15.

Consumption, in particular European, diversifies vertically (quality range) as well as horizontally, i.e. on a variety scale. Vertically, the accession of 10 New Member States (NMS), the GDP/head of which is, on average around 40% of the former EU 15 average, reinforced the lower end demand in Europe⁵ (Boillot J-J. and Lepape Y., 2004). The demand for automobile belonging to the average-high end (starting from the D segment, i.e. cars like BMW series 3 or the Peugeot 406) also tend to grow, pushed up by income per capita growth. Horizontally, professionals note that demand for diversity does not cease developing in Europe. Consequently, the number of available models increases and their life-cycle shortens.

For car and equipment manufacturers, these evolutions mean more R&D, more collaboration and information sharing upstream and downstream, as well as the functional reinforcement within the firm of design activities. How have these companies adapted industrially?

1.2. Evolutions of the market structure, of production processes and the location of facilities: a continuous race for scale economies

In particular, during the last two decades, car manufacturers and, consequently, their suppliers upstream, had to widen and deepen continuously both the quality and variety range of products they offered (mix prices/products), in a context of reinforcing competition. As the automotive sector is a rather capital and labor intensive industry (Vickery G, 1996), flexibility and scale economies have been the two “masterswords” for firm strategies⁶.

Changes took place at three levels:

* At the level of the market structure, a movement of actor concentration took place between manufacturers, which might soon come close to an end. The same concentration process is currently in process among component suppliers. The European market is regarded as fragmented and strongly competitive (Nunnenkamp P. and Spatz J, 2002).

* Concerning relations between companies, a “deverticalisation” of automobile factories (Sturgeon T. and Lestner K., 2002) can be observed: car companies more and more outsource or subcontract. Thus, at the end of the nineties, General Motors and Ford, spinned off their respective spare part branches, which are now independent firms (Delphi and Visteon respectively). Consequently, parts and components coming from external suppliers nowadays represent between 70% and 80% of the production costs of a vehicle. Developing employment figures in both of these subsectors have been reflecting this dynamic for twenty years, i.e. the development of a financially independent car component sector (Brocart P. and Donada C, 2003; Nunnenkamp P. and Spatz J, 2002).

* Within the firms, the organization of production processes evolved into three directions. First, manufacturers developed so called “platform strategies”, which means that a production line is organised in such a way that it can produce various models. PSA, for example,

⁵ It is a direct consequence of enlargement. Without the latter, the diversification of demand would not have reached the same proportions.

⁶ The car assembly sector has strong capital intensity and sensitivity to internal scale economies: it is considered that an optimum lies around a production of 300.000 vehicles per annum for a car assembly factory, the corresponding investment being about €1 bn. The share of labour costs in the production is a bit less than 20%. Upstream, the sector car components appears from this point of view much more heterogeneous: motors production, for example, is sensitive to scale economies whereas cables one is not.

assembles all its vehicles from 3 platforms only: one for low end cars, another for average and high end automobiles and a third dedicated to commercial vehicles. As a result, on one hand, a bigger standardization of production processes as well as inputs has been emerging and, on the other hand, production facilities are getting more specialised, yet, in such a way that they are still able to produce several models. These platform strategies greatly improved the “flexibility/scale economies” combination for car manufacturers.

Upstream and in parallel, so called “level 1” component suppliers currently transform themselves into assemblers: they more and more deliver to manufacturers already assembled modules, along with “traditional” spare parts. Thus, “modularization” has developed particularly for two of the car functions: the cockpit (instrument panel) and the “front block” (bumper, radiator, condensator and lighting system). Other modules, like doors or the “back block”, start to equip the vehicles. And rather sooner than later, a complete cockpit module, integrating several modules, should be coming on the market. What equipment suppliers are concerned, the increasing importance of electric and electronics has to be underlined. Experts expect them to amount to 35% of manufacturing costs of a vehicle in 2010. That would then be more than for mechanics (Brocart P. and Donada C, 2003).

If, indeed, manufacturers have been more and more outsourcing to “row 1”-suppliers, in parallel a reinforcement of the customer-supplier co-operation can be observed: co-operation in the design of car components, with a share in R&D costs supported by the supplier; co-operation in management production flows, with a strong Juste-In-Time (JIT) constraint. When the hull of a car has been painted, it engages on the assembly line, the schedule to fix the seats for example (or any other part), and thus the schedule for spare parts delivery along the production line is determined within about a quarter of an hour. Transportation costs of complete modules being particularly high, these suppliers are themselves almost obliged to go along with manufacturers in their internationalization programme and to install their own assembly units close to those of the car producer (in general, inside a 100 km circle around the factory). These facilities are also used as intermediate storage places between the manufacturing of the various spare parts composing a module and the final assembly line of the vehicles. The same scheme is reproduced between “row 1”-suppliers and “row 2” ones and so on.

These changes in the sector entailed a greater division of productive processes (Lassudrie-Duchêne, 1982 ; Fontagné, 1991 ; Feenstra et Hanson, 1996) and has lead to a greater specialization of factories. Theoretically, it would be possible for one production unit to provide the whole European continent with one kind of car or spare parts. Yet, for at least two reasons it doesn't too often happen: first, a necessary geographical diversification of industrial risks and, second, the induced logistic costs. On a European scale, it is much more widespread for a “global” company, or at least for a “continental” one, to have a scheme with two units or production lines (or suppliers) for one product.

* The existence within a free trade zone of low labour cost countries accelerates the division of productive processes. As for a consequence, “a new” sectoral economic geography in general emerges within those great regions, in terms of concentration and dispersion of the activities. A production facility which is close to its upstream and related industries in general generates external scale economies. In such areas with strong activity concentration, so called “clusters” or “core regions”, wages are higher than in the “periphery”. Firms must thus arbitrate between transaction costs, logistic ones, new investments, the wage differential and internal as well as external scale economies, all of them being affected by a location change (Krugman P., 1991; Fujita M. and al, 2001). In Europe, the car industry tends to preserve its degree of concentration (Mindelfart-Knarvik and al, 2000), but still not at the same level as in the United States. The agglomeration of a complete field of activity (upstream industries and related ones included) associated with a dynamic local demand, reinforces a country's or a region's specialization and the probability for a productive pole to survive and develop.

The potentially always greater division of productive processes, among others due to a growing technological complexity, also stimulates the geographical diversification of car components production. Conversely, logistic constraints, the reinforcement of innovation in the value added chain as well as the diversification of intermediate inputs (more electronics, plastics and equipment generally speaking) stimulate the geographical concentration of firms linked to the automobile branch: vertically and especially horizontally integrated “clusters” emerge.

1.3. Investments and the development of trade: qualification of the nature of the Central and Eastern European automobile pole

* The revival of the car industry in these countries has been carried out thanks to foreign direct investments (FDI). Foreign owned companies represent between 70% and 95% of sales and exports in Central and Eastern European countries, depending on each country. Investments in the car industry concentrate in the Czech Republic, Hungary, Poland, Slovakia, Slovenia and Romania (see map of the main investments in appendix). From a transnational point of view, they concentrate in an oval which includes the south of Poland, 2/3 of Slovakia, the north and the west of Hungary as well as the Czech Republic as a whole (Boillot J-J. and Lepape Y, 2004). Geographically, the Romanian car industry and, to a lesser extent, the Slovenian, are a little outside this regional pole.

The table hereafter shows some current and expected characteristics of the car manufacturing production sites. A specialization of the production on entry and average ends of vehicles emerges. The analysis of trade will confirm this microeconomic observation.

**Automobile production in Central and Eastern European countries en 2002
and forecasted increases for 2010**

Producteur	Pays	Modèles	Localisation	Prod VP 2002	Aug Prod 2010
Renault	SLV	Clio	Novo Mestro	127 000	140 000
Suzuki	HU	Swift (Ignis en 2003)	Estergom	85 000	110 000
Audi	HU	TT/A3	Györ	53 000	
Skoda	CZ	Fabia, Felicia, Octavia	Mlada Boleslav	427 000	
Skoda	CZ	Superb	Kvasini	14 000	
Peugeot/Toyota	CZ		Kolin		300 000
Hyundai	SLK	Modèle non défini	Zilina		300 000
Peugeot	SLK	Projet	Trnava		300 000
VW	SLK	Polo, Bora, Golf	Bratislava	225 000	135 000
Renault/Dacia	ROU	Nova	Pitesti	45 000	200 000
Daewoo	ROU		Craiova	20 000	
Daewoo	POL	Matiz	Varsovie	36 000	
Opel (GM) + Suzuki	POL	Astra, Agila (VU)	Gliwice (SLA)	86 000	
Fiat	POL	Seicento (exclusif EU), Uno, Panda		126 000	115 000
VW	POL	VU	Poznan (WIEL)	40 000	110 000
Total				1 284 000	1 710 000
Daihatsu	CZ ou HU ??				? 300 000
Mazda	??				? 300 000

Source : Boillot J-J. et Lepape Y. (2004)

1.4. Theoretical framework, typologies of trade and interpretations

* The development intra-industry trade of similar products (or intra-industry “horizontal” trade) between countries with comparable economic structures and endowments of production factors, opened to economists new research fields and beyond the traditional framework of the international trade. The latter rested on Ricardo’s theories and the Heckscher-Ohlin model where the countries’ specializations, and hence trade, were depending on their relative comparative advantages. The “economic distance” between the countries was regarded as the main factor that determines the specialization of the countries in the various branches of the economy (L. Fontagné and M. Freudenberg, 1997).

K. Lancaster (1980) and P. Krugman (1979, 1980) show that, within the framework of markets with monopolistic competition, the development of intra-industry trade can be explained by a process of differentiation of products that are no longer supposed to be homogeneous, as well as increasing economies of scale. A synthesis emerged from work of E. Helpman and P. Krugman (1985), who associate within the same theoretical framework the differentials of endowments of production factors, the horizontal differentiation of products and scale economies, to explain the development of intra industry trade. Between two countries with a comparable development level, a “horizontal” intra-industry trade will develop (trade in “varieties”) and between “economically” distant countries, an intra-industry trade rather of a vertical type will emerge, corresponding to a differentiation on the “quality” scale (L. Fontagné and M. Freudenberg, 1997).

* The adjustment costs will depend on the type of specialization and differentiation which occurs. The development of inter-industry trade implies changes in production factors between sectors. Associated costs are supposed to be greater than in the case of “horizontal” intra-industry because of an “incomplete portability of factors and assets across industries” : in the case of a transfer from a firm to another inside a sector, human capital in particular is less depreciated (Fontagné L. et Freudenberg M, 2002). In the case of “vertical” intra-industry trade, a liberalization of the movement of production factors may provoke, in high income countries, a fall in wages and employment in these sectors where import penetration is strong and a production transfer to low wage countries are not particularly constrained. High wages can, nevertheless, persist in sectors specialized on segments with strong productivity or added value. Hence, a specialization along the quality spectrum (“vertical” intra-industry trade) may imply relative losses (in wages and employment) for employees with little or no qualifications in high income countries, compared to qualified employees.

The following table sums up the relations between the determinants of specialization, the type of associated trade and potential adjustment costs for the economies.

Determinants of trade types and potential effects on integration

Determinants	Traditional theories		New International Trade theory	
	Factor endowments	Productivity differences	External	Internal
Trade patterns	Inter-industry trade		Intra-industry trade in vertical differentiation horizontal differentiation	
Specialisation	along comparative advantages	through agglomeration economies	along the quality spectrum	in varieties
Adjustment costs	Important (changes in factor prices among industries within countries)		Potentially important (potential income divergence among countries)	
				Weak

Source : Freudenberg M. et Lemoine F. (1999), taken from Fontagné L. et Freudenberg M. (1997)


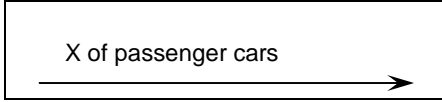
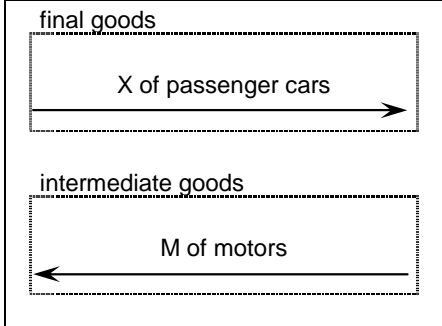
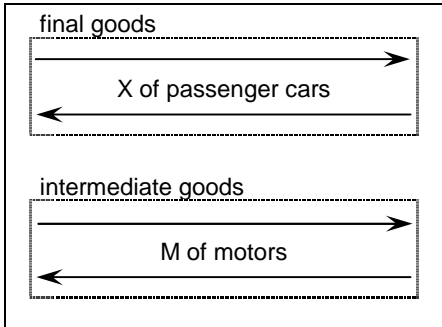
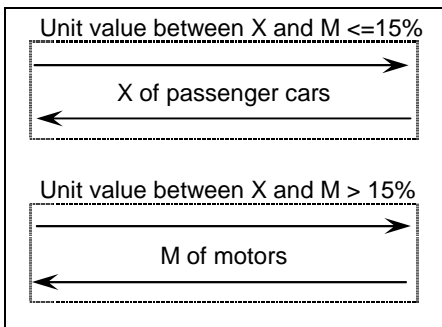
* In the literature, two “families” of methodologies and indicators were developed to measure intra-industry trade. The first one is based on the Grübel-Lloyd indicator. When this indicator is calculated on a highly disaggregated product level and for bilateral trade, it enables to measure the importance of overlapping trade of identical products (or regarded as such in the product nomenclature used). But its use has been criticised (L. Fontagné and M. Freudenberg, 1997) as:

- it does not distinguish the vertical from the horizontal type of the studied intra-industry trade, i.e. differences in qualities
- two different theoretical frameworks are used to explain the same trade flow.

The second group of indicators, initiated by Abd-El-Rahman (1986) and further developed, in particular, by L. Fontagné and M. Freudenberg, takes into account the differences in quality through the unit values of imported and exported products. Using two criteria, i.e. the share of “cross” trade of products and the “similarity” of unit values, total trade is divided into three groups: one-way trade, two-way trade of similar products and two-way trade of vertically differentiated products.

The following table draws up this trade typology and its interpretation.

Interpretation of trade flows depending on the level of analysis

International trade	Level of analysis		
	Industry	Product	Interpretation
<p>Textile Industry</p>  <p>Automobile industry</p> 	Inter-industry trade	One-way trade	Traditional international division of labour
		One-way trade	
<p>Automobile industry</p> 	Intra-industry trade	One-way trade	International splitting-up of the production process
		One-way trade	
<p>Automobile industry</p> 	Intra-industry trade	Two-way trade	Two way trade in final goods
		Two-way trade	Two way trade in intermediate goods
<p>Automobile industry</p> 	Intra-industry trade	Two-way trade	Two way trade in similar (final) goods
		Two-way trade	Two way trade in vertically differentiated (intermediate) goods

Source : Fontagné L. et M. Freudenberg (1997)

* In this research, the share of the three groups of trade defined below (L. Fontagné and M. Freudenberg, 1997) was calculated at a 6-digit level of disaggregation of the “Harmonized System” (HS).

- the trade of products is regarded as “two-way” when the value of the minority flow accounts for at least 10% of the majority flow

$$\frac{\text{Min}(X_{kk'it}, M_{kk'it})}{\text{Max}(X_{kk'it}, M_{kk'it})} > 10\%$$

Below this threshold, the whole of the flows (imports + exports) is considered as “one-way”.

- import and export flows (for a product) are regarded as “similar” when their unit values are close to each other and the whole value of those flows is then categorized as an “horizontal” two-way trade. Import and export flows are regarded as “vertical” if their unit values differ more than 15%.

$$\frac{1}{1.15} \leq \frac{UV_{kk'it}^X}{UV_{kk'it}^M} \leq 1.15$$

Calculations were not carried out for all European countries, but only for six of them in Central and Eastern Europe (the Czech Republic, Hungary, Poland, Slovakia, Slovenia and Romania) and for six of the former EU15 (Germany, Belgium, Spain, France, Italy and the United Kingdom). The indicators of bilateral trade were examined for 77 pairs of countries⁷. Two reasons may be mentioned: first, the Double Relative Intensities of trade exhibit a strong trade polarization in the automobile industry and second, Germany, France, Italy and Spain together account for 70% of total imports of the 10 Central and Eastern European countries. On the CEEC side, only six countries produce vehicles and car components.

* This first part of the paper reminds that the strategies developed by the firms in response to globalisation as well as the demand from consumers stimulate, on one hand, an increasing division of the production processes and, on the other hand, scale economies. The second and the third part of this paper aim at qualifying the nature of the automobile pole which emerged in Central and Eastern Europe. Depending on its nature, a more or less important transfer of production factors from “traditional” poles of Europe to Central and Eastern European ones can be expected.

II. A progressive integration into European production processes and particularly into the German ones

Local car production, upstream, which has been on average continuously growing since the beginning of the CEEC’ economic transition stimulated the development of the car component sector, due to important FDIs. These countries’ attractivity is based on a longstanding tradition in automotive engineering, their proximity to the large European markets, a favorable wage differential and an educated labour.

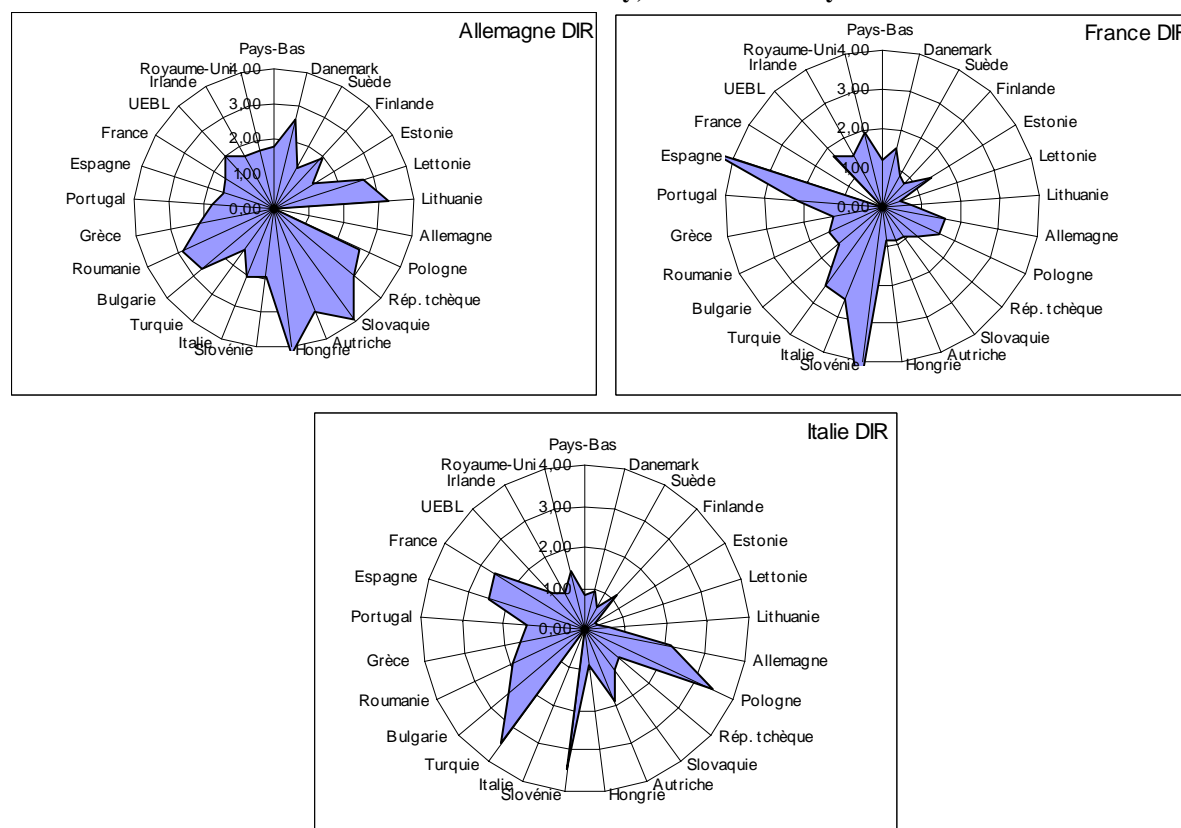
This part is going to examine the geographical and product specializations of the CEEC through different trade indicators.

⁷ All pairs of countries of the CEEC between them, with the countries of the former EU15, and Spain with the CEEC and countries of the former EU15.

2.1. Geographical specialization of the CEEC

Has trade homogeneously developed between the CEEC and the former EU 15 or have geographical specializations emerged? Within enlarged Europe, privileged trade (and investment) relations exist, in general between countries that share, at least partly, “common history”⁸. The indicator of Double Relative Intensity of trade⁹ shows a strong polarization with Germany in the case of Central Europe as well as intense trade between France and Slovenia and also between Italy and Poland and Slovenia¹⁰. Let us also remember that, in terms of volume, the German territory dominates the EU-CEEC trade (J-J. Boillot and Y. Lepape, 2004).

Double Relative Intensities of trade for Germany, France and Italy in the automobile in 2002



Source : Chelem-CEPII ; authors' calculations

⁸ An example is the « MittelEuropa » but also the Baltic region (not pertinent in the case of the automobile sector but for “total goods and services”). Its common history started in the 12th century with the creation of the Hanseatic League. Further analysis of the European subregions in J-J. Boillot (2003) and J. Lefilleur (2005).

⁹ Double Relative Intensity of trade :

$(X_{ij}+M_{ij})/(X_{mo}) * 2 / ((X_{jto}+M_{jto}) * (X_{ito}+M_{ito})) / (X_{mo} * M_{mo})$, where X are exports, M the imports, I and J are the two trading countries, “to” means “total” and “Mo” “world”. This indicator was developed by M. Freudenberg, G. Gaulier et Deniz Ünâl-Kensenci (1998)

¹⁰ Thus, with Enlargement, the European car industry (re)structures around three border-overlapping poles, with agglomerations of manufacturers (supply) and population (demand). A region dominated by Volkswagen (and German producers), which extends from Germany to the North-West of Romania and which covers the whole Central and Eastern Europe automobile pole; firms specialized in the “lower” range (segments A, B and C) are rather located in the CEEC and the ranges “average-higher” and “high” in Germany (segments C to E). The second pole is the one belonging to the so called “economic core of Europe”, characterised by a strong presence of French car manufacturers; production of cars from the B to D segments are dominating there. Third, the Iberian pole is more balanced between French, German, American as well as some Asian manufacturers, and includes the South of France. The trade of the Rhone-Alps region is roughly balanced between Spain, Germany and Italy; in this pole, production is centered on the A to C segments, as in the CEEC. These large basins are also characterized by a strong density of equipment suppliers, for whom these basins will be a kind of “catchment areas” (see map in the Introduction of this paper).

What are the product specializations of the CEEC ?

2.2. A growing production of car components and upper stream integration

The vehicle production in Central and Eastern Europe (CEE), at the beginning of the transition, took place in a vertically¹¹ internationally splitted production scheme with the EU: the CEE imported the necessary components to assemble the cars that were then for their major part re-exported to the Union.

Changes in the trade pattern nowadays indicate an industrial involvement in the “upper” production stage of the automobile field : all countries of the CEE, except Slovakia, had in 2003 a Revealed Comparative Advantage (RCA)¹² in the subsector of automobile components. All four main automobile producing countries (PC4) have an RCA, though rather weak, with Spain for car components as well as for the whole sector. Germany has on its side a wide comparative disadvantage with each Central European and Eastern country, that was taken into consideration.

Revealed Comparative Advantage (RCA) of the Czech Republic, Hungary, Poland, Slovakia, total PC 4 and Spain with Germany (DE), Spain, France and the World in 2003 (1000th of GDP points), for the automotive sector (Auto+PD), vehicles (Auto) and car components (PD)¹³

Declar	Partner	Product	RCA	Declar	Partner	Product	RCA	Declar	Partner	Product	RCA
CZ	DE	Auto+PD	13	HU	DE	Auto+PD	44	PC4	DE	Auto+PD	20
CZ	DE	Auto	5	HU	DE	Auto	9	PC4	DE	Auto	6
CZ	DE	PD	9	HU	DE	PD	35	PC4	DE	PD	14
CZ	ESP	Auto+PD	2	HU	ESP	Auto+PD	2	PC4	ESP	Auto+PD	1
CZ	ESP	Auto	1	HU	ESP	Auto	-2	PC4	ESP	Auto	0
CZ	ESP	PD	1	HU	ESP	PD	4	PC4	ESP	PD	1
CZ	FR	Auto+PD	0	HU	FR	Auto+PD	-3	PC4	FR	Auto+PD	-1
CZ	FR	Auto	-1	HU	FR	Auto	-3	PC4	FR	Auto	-2
CZ	FR	PD	1	HU	FR	PD	0	PC4	FR	PD	1
CZ	WOR	Auto+PD	43	HU	WOR	Auto+PD	52	PC4	WOR	Auto+PD	35
CZ	WOR	Auto	26	HU	WOR	Auto	-1	PC4	WOR	Auto	13
CZ	WOR	PD	17	HU	WOR	PD	53	PC4	WOR	PD	22
POL	DE	Auto+PD	7	SLK	DE	Auto+PD	55	ESP	DE	Auto+PD	-3
POL	DE	Auto	0	SLK	DE	Auto	39	ESP	DE	Auto	-2
POL	DE	PD	7	SLK	DE	PD	15	ESP	DE	PD	-2
POL	ESP	Auto+PD	1	SLK	ESP	Auto+PD	-5	ESP	ESP	Auto+PD	
POL	ESP	Auto	-1	SLK	ESP	Auto	1	ESP	ESP	Auto	
POL	ESP	PD	2	SLK	ESP	PD	-7	ESP	ESP	PD	
POL	FR	Auto+PD	-2	SLK	FR	Auto+PD	0	ESP	FR	Auto+PD	1
POL	FR	Auto	-3	SLK	FR	Auto	1	ESP	FR	Auto	4
POL	FR	PD	1	SLK	FR	PD	-1	ESP	FR	PD	-3
POL	WOR	Auto+PD	13	SLK	WOR	Auto+PD	113	ESP	WOR	Auto+PD	12
POL	WOR	Auto	-2	SLK	WOR	Auto	122	ESP	WOR	Auto	15
POL	WOR	PD	15	SLK	WOR	PD	-9	ESP	WOR	PD	-3

Source : Comtrade, authors' calculations

¹¹ “Vertical” refers here to production stages and the « hierarchy » between « final goods », “intermediate goods » and “equipment goods”. “Vertical” is also used to qualify the quality differences between imported and exported goods, and they are not to be confused as they refer to different concepts.

¹² RCA are calculated according to the formula $(X_s - M_s) - [((X_s + M_s) / (X_{to} + M_{to})) * (X_{to} - M_{to})] * (1000 / \text{PIB})$, where X and M are exports and imports respectively, subscript “s” indicate a sector and “to” total (trade).

¹³ The total of vehicles and components, was obtained by summing up the following product categories of the HS nomenclature: 8703, 8706, 8707, 8708, 940120, 84073, 840790, 840820, 8511, 8512

2.3. Product specializations

Have product specializations been developed for a small number of them or have they covered a wide range of automobile products? Are these specializations complementary or concurrent to other European countries and Spain, in particular?

The table below shows that

- exports of the five first product specializations of the CEEC (on 6-digit disaggregated product level of the HS nomenclature) weigh between 65% (Poland) and 81% (Slovakia) of their exports. In Slovakia, one product (tourism vehicles of a capacity ranging between 1500 cm³ and 3000 cm³) represents more than 50% of total sales abroad. A “small highly specialized economy”, may quickly be weakened by an asymmetrical shock.
- specialization of Spanish products primarily concerns tourism vehicles (codes 8703XX); for these products, Spain is strongly in competition with the CEEC, i.e. on the lower and mid-end quality range of vehicles (those between 1000 cm³ and 3000 cm³ with gasoline motors and below 1500 cm³ for diesels)
- a strong specialization in engines emerges in Central and Eastern Europe: those running with gasoline and a capacity over 1000 cm³ (840734) in Hungary and those with diesel in Poland and Hungary (840820); the Czech R. has a strong RCA in the electrical equipments for cars (Electrical appliance - lighting and signals for automobile, 851220) and the bodies, just like Slovakia for the latter.

The first five Revealed Comparative Advantage (RCA) for each country en 2003 and their respective (cumulated) weight in exports (%)

Country	Product	RCA	%	Country	Product	RCA	%
CZ	851220	4,8	69	SLK	870893	2,0	81
CZ	870899	4,9	64	SLK	940120	13,4	80
CZ	870829	9,0	53	SLK	870332	21,0	74
CZ	870332	12,0	37	SLK	870710	24,9	62
CZ	870322	12,5	17	SLK	870323	112,8	51
HU	870840	2,3	75	POL	870899	0,8	65
HU	870899	2,7	71	POL	870870	1,1	58
HU	870323	5,6	66	POL	870821	1,2	54
HU	840820	17,4	53	POL	870322	2,9	51
HU	840734	29,0	33	POL	840820	10,5	31
ESP	870321	0,6	66	PC4	870322	2,6	60
ESP	870331	1,5	65	PC4	870332	2,8	49
ESP	870332	1,7	61	PC4	840734	4,9	39
ESP	870323	5,0	40	PC4	840820	7,5	30
ESP	870322	6,8	16	PC4	870323	8,2	17

Source : Comtrade, authors calculations

III. An already high level of intra-industry trade

The CEEC nowadays widely participate in continental productive processes in the automobile sector, with a strong geographical polarization with respect to Germany. In addition, some products only, represent the main part of their exporting flows.

The analysis of this integration relation is to be completed with the nature of trade: is it, on one hand, of the one-way intra-industry type (trade of cars against seats for example) or of the two-way type and, on the other hand “vertical” or “horizontal” on the scale of quality? The adjustment costs on a European scale being the stake of this question.

3.1. Two-way horizontal intra-industry trade is quickly developing

The pairs of countries were classified into various categories, defined as follows:

- the level of two-way trade, as opposed to one-way trade, compared with the regional average (EU6 or CEEC6 depending on cases) ; it may be higher, equal or lower than the average, a threshold of 10% was retained; these levels can then be increasing, stable or falling;
- the share of “horizontal” two-way trade, or trade of similar products, as opposed to “vertical” trade; the same comparison with the regional average is used, as well as changes.

* According to the results shown in the tables below, several observations can be made:

- in the automobile sector, the level one-way trade between the CEEC and the EU is low compared to many other sectors (M. Freudenberg and F. Lemoine, 1999); in parallel, the weight of the two-way trade of similar products is higher;
- in accordance with theory, levels of “horizontal” intra-industry two-way trade between Spain and the EU6 is higher than in the case of the CEEC with the EU6; on the other hand, these same flows represent a small percentage of trade within the CEEC in the automobile sector, whereas the economic distance between these countries is weak; this phenomenon might be explained by the specialization of production facilities in the region¹⁴;
- in terms of evolution during the period in question (1995-2003), two-way trade between Central and Eastern Europe and the six main vehicle producing countries in former EU15, on average, increased; the same phenomenon happened between the CEEC (except for Hungary and Slovenia); the same observation can be made for horizontal two-way intra-industry trade between Central European and Eastern countries and the EU6; regarding this two-way trade of similar products between the CEEC, only the Czech Republic’s and Romania’s have risen.
- In 2003, six EU-CEEC couples of countries (to be compared with a total of 36 couples) achieved more than 80% of their trade as two-way trade: Slovenia (SLV), Poland (POL) and the Czech Republic (CZ) with Germany (DE); Hungary (HU) and Slovakia (SLK) with France and, the Czech Republic with Italy. For 20 couples, this type of trade flow exceeds 50% of total trade of the automobile sector. Within the CEEC and in 2003, the maximum share of intra-industry two-way trade was achieved between Poland and Hungary, reaching 68% of their total sectoral trade. The threshold of 50% is reached only in two other cases: Slovakia - Czech Republic and Romania - Hungary.
- Regarding two-way horizontal trade, the maximum was carried out in 2003 between Italy and the Czech Republic, i.e. 63% of their bilateral trade in the automobile sector. It is also significant between the Czech Republic and Spain, Poland and almost all countries in question of the EU15. Last, it is high as well between Slovenia and the United Kingdom and Germany. Between the CEEC, two-way trade of similar products are the highest between Hungary and Poland and, the Czech Republic and Slovakia and Slovenia.

¹⁴ Considering the size of the Central and Eastern European automobile sectors (and their economies), for a given product, all of these countries may be supplied by a unique production facility. This tends to increase the weight of one-way intra industry trade within the CEEC.

**Share of intra-industry trade in the automobile sector :
yearly average for the 1995-1999 period, yearly average for the 2000-2003 period and in 2003**

IIT	BELUX			DE			ESP			FR			ITA			UK			EU6		
	Value 2003	Av. 95-99	Av. 99-03	Value 2003	Av. 95-99	Av. 99-03	Value 2003	Av. 95-99	Av. 99-03	Value 2003	Av. 95-99	Av. 99-03	Value 2003	Av. 95-99	Av. 99-03	Value 2003	Av. 95-99	Av. 99-03	Value 2003	Av. 95-99	Av. 99-03
CZ	25,7	56,7	39,6	89,2	83,7	87,2	70,1	78,0	65,6	67,8	86,8	78,4	82,9	73,3	78,0	22,7	21,1	17,7	59,7	66,6	61,1
HU	28,1	10,7	21,6	45,6	37,8	39,8	14,7	9,8	33,2	80,1	61,5	77,6	68,1	75,2	69,7	45,1	27,8	34,1	46,9	37,1	46,0
POL	37,7	36,3	32,2	85,5	33,3	64,0	36,0	24,3	47,8	60,3	35,1	56,0	75,3	46,2	75,5	46,8	56,3	56,5	56,9	38,6	55,4
ROU	12,6	19,4	9,5	28,8	10,8	26,1	0,8	23,5	0,2	7,2	21,4	4,2	71,1	52,7	60,1	29,7	10,6	31,6	25,0	23,0	21,9
SLK	64,5	55,4	54,5	34,7	55,2	36,7	9,4	27,0	6,2	93,0	62,7	90,0	12,8	9,6	4,9	64,1	28,7	53,2	46,4	39,8	40,9
SLV	6,2	3,3	23,8	92,9	52,6	79,5	21,9	16,1	23,4	79,6	67,9	78,2	64,3	57,6	75,2	52,5	17,9	41,0	52,9	35,9	53,5
ESP	86,6	63,7	84,2	85,5	73,3	86,6				98,0	89,1	96,7	86,1	74,1	86,5	88,4	93,1	86,9	88,9	78,7	88,2

IIT	CZ			HU			POL			ROU			SLK			SLV			CEEC6		
	Value 2003	Av. 95-99	Av. 99-03	Value 2003	Av. 95-99	Av. 99-03	Value 2003	Av. 95-99	Av. 99-03	Value 2003	Av. 95-99	Av. 99-03	Value 2003	Av. 95-99	Av. 99-03	Value 2003	Av. 95-99	Av. 99-03	Value 2003	Av. 95-99	Av. 99-03
CZ																			37,6	27,5	41,7
HU	16,6	32,8	14,1																21,1	38,2	22,3
POL	36,7	33,2	47,6	67,8	44,6	56,9													35,6	33,2	33,8
ROU	30,9	31,1	24,9	56,8	29,6	30,2	13,4	0,8	4,4										27,8	18,6	20,2
SLK	58,4	40,4	49,9	10,8	57,3	11,6	30,1	49,1	35,1	43,4	18,8	26,7							44,1	37,0	44,7
SLV	37,5	12,2	51,6	6,7	42,3	17,1	18,0	41,6	35,2	3,6	6,2	12,2	39,0	14,5	41,8				8,9	21,0	17,1
ESP	70,5	63,4	70,0	9,3	17,4	22,7	29,7	26,2	35,9	4,8	9,7	6,8	68,6	28,7	29,2	50,8	9,8	26,4	32,6	18,3	24,2

Source : Comtrade, authors calculations

Legend :

Figures in green are at least 10% higher than the regional average (EU6 average for CEEC-UE bilateral trade and CEEC6 average for CEEC-CEEC couples) ; in red the figures are lower than 10% of the average used; the other values are in black.

Bowed figures means: IIT is rising on the period, in italic, it means they are declining and normal means « stable » (or a 2003 value between 1995-1999 and 2000-2003 averages)

**Share of horizontal intra-industry two-way trade:
yearly average for the 1995-1999 period, yearly average for the 2000-2003 period and in 2003**

IIT Horiz	BELUX			DE			ESP			FR			ITA			UK			EU6		
	Value 2003	Av. 95-99	Av. 99-03	Value 2003	Av. 95-99	Av. 99-03	Value 2003	Av. 95-99	Av. 99-03	Value 2003	Av. 95-99	Av. 99-03	Value 2003	Av. 95-99	Av. 99-03	Value 2003	Av. 95-99	Av. 99-03	Value 2003	Av. 95-99	Av. 99-03
CZ	3,7	20,7	16,3	6,7	40,5	17,0	49,1	24,2	38,5	34,1	15,0	36,6	62,7	46,9	53,2	1,1	9,7	0,6	26,2	26,2	27,0
HU	19,7	6,0	10,5	14,6	3,5	10,6	12,2	4,1	22,3	26,5	11,0	10,5	24,8	1,0	19,0	0,0	4,7	2,0	16,3	5,0	12,5
POL	16,5	25,7	9,2	37,5	4,9	28,2	11,3	11,4	27,9	41,6	7,6	22,6	46,4	14,4	44,8	40,9	23,1	35,4	32,4	14,5	28,0
ROU	9,5	6,3	3,8	13,6	0,0	3,6	0,2	2,4	0,1	4,5	0,3	1,1	1,0	4,0	0,6	0,3	0,0	4,5	4,9	2,2	2,3
SLK	0,0	12,4	0,1	5,4	19,0	5,8	0,0	5,5	2,0	34,9	14,8	26,9	0,0	0,0	0,1	0,0	0,0	0,0	6,7	8,6	5,8
SLV	0,0	0,4	2,2	56,7	36,7	57,6	7,0	6,5	4,6	18,4	25,0	29,1	1,2	16,4	38,7	49,8	0,0	20,8	22,2	14,2	25,5
ESP	67,4	36,4	63,9	50,8	31,8	42,8				74,4	51,0	68,3	42,9	39,0	52,2	78,7	33,9	66,2	62,8	38,4	58,7

IIT Horiz	CZ			HU			POL			ROU			SLK			SLV			CEEC6		
	Value 2003	Av. 95-99	Av. 99-03	Value 2003	Av. 95-99	Av. 99-03	Value 2003	Av. 95-99	Av. 99-03	Value 2003	Av. 95-99	Av. 99-03	Value 2003	Av. 95-99	Av. 99-03	Value 2003	Av. 95-99	Av. 99-03	Value 2003	Av. 95-99	Av. 99-03
CZ																			16,5	7,0	15,3
HU	2,0	11,2	1,4																8,5	15,2	10,5
POL	13,3	2,8	16,4	30,6	20,8	27,1													7,7	6,3	13,7
ROU	2,8	8,1	1,3	0,7	2,5	1,9	0,0	0,2	0,2										3,2	0,9	3,2
SLK	29,7	8,1	18,6	0,6	19,5	1,1	1,1	9,3	9,4	6,3	1,8	4,6							8,2	7,4	12,9
SLV	20,6	2,7	35,7	1,4	9,1	7,8	6,7	8,1	29,9	2,8	0,9	1,9	6,0	0,8	12,7				4,5	5,8	12,1
ESP	33,1	43,5	39,6	1,7	10,0	19,0	25,5	7,0	7,7	0,0	2,6	1,1	1,7	0,0	1,8	3,8	0,1	4,1	6,5	4,0	6,7

Source : Comtrade, authors' calculations

Legende : see table above

The German case deserves a particular attention due to its share in the CEEC trade in the automobile sector.

3.2. A vertical integration relation with Germany

* The two-way commercial share between Germany and the CEEC has risen, 63% on average in 2003, but is, nevertheless, lower than the one noticed between France and the six Central European and Eastern countries in question (65%). The German trade with this region is especially characterized by a strong share of two-way trade vertically differentiated products, thus on a quality scale, which amounts up to 40% of the total trade, in France up to 38%.

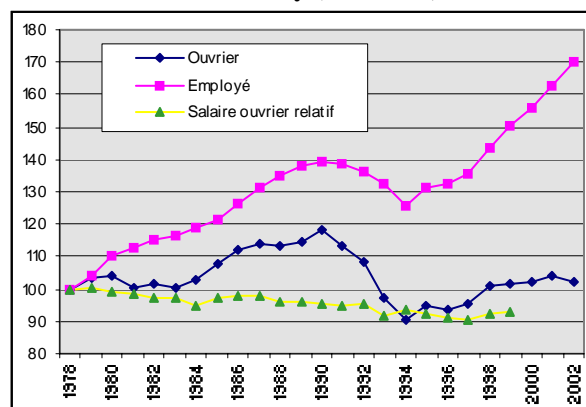
Moreover, the proportion of vertical trade regularly grows: on average, it was 28% over the period 1995-1999 and 35% between 2000 and 2003. This growing share is pushed up by this type of trade with Romania and, more surprisingly, with the Czech Republic, the main trade partner, in the regions, of firms located in Germany. Conversely, for France or Spain¹⁵, an opposite dynamic is observed, i.e. a vertical intra-industry two-way trade that is decreasing to the benefit of “horizontal” trade. Thus, and theoretically, the impact of enlargement and the emergence of this automobile pole in the CEEC should be the highest on Germany among the high income countries of the Union. What has it really been?

* On the market of goods, the terms of trade for the automobile sector has moved since 1980 in favour of the firms established on the German territory. In Spain, during the eighties, and in the CEEC since 1990, there were few barriers to locate the whole or part of a production in these lower income countries. The evolution of the terms of trade has been reversing since 1996, probably influenced by the fast wage catching-up process observed in the CEEC¹⁶.

Currently, approximately 30% of the components imported by the car industry in Germany come from Central and Eastern Europe. In this context and according to “rent-sharing” models, maintaining high wages (and to increase employment) in the German car industry is only possible if specializations on strong added value segments are also maintained. The employment of qualified labour continued increasing in Germany, as well as the wages of this category. Compared to the 80’s, the wages of employees with little or no qualifications are roughly at the same level. In consequence, relatively to labour with higher skills, this category suffered a relative loss in terms of wages and employment, as expected by theory. But overall, the impact on the labour market may be considered as quite moderate.

Two reasons can be put forward to explain this moderate impact. First, CEEC automobile sectors (and economies) are of a small size compared with those in Germany. Second, the CEEC represent an additional and furthermore dynamic demand to the European car industry (in parallel of bringing new competition) which, even marginally, contributed to the development or, at least, to the maintaining of activity in Germany. This low cost industrial *Hinterland* helped the German car industry to increase profitability and to maintain or even develop its international competitiveness (Nunnenkamp P., 2005). From this point of view, firms located in France or Spain may face fierce competition from the CEEC first of all in Germany rather than on their own territories¹⁷.

Changes in average wages of employees, of workers and relative wage of workers compared to employees in Germany (1978=100)



Source : Nunnenkamp (2003)

¹⁵ In Italy, one observes the same dynamics as in Germany, just in smaller proportions.

¹⁶ The existence of common borders is not without influence on the investment strategies of the firms.

¹⁷ This phenomenon can be observed in the agricultural sector for example (Lepape Y., Regnier E., Rousset G., 2004).

Conclusion

* The globalisation-continentalisation process of trade and firm strategies, and the evolutions of demand in direction of a greater diversity largely influenced the market structure of the automobile sector, but also of the organisational processes within the firms. The car manufacturer market appears particularly concentrated at the world's level and a little less on a European scale. Scale economies and the reinforcement of the role of logistics, in Europe as well as elsewhere in the world, have been the two main constraints for car manufacturers and equipment suppliers. In this context, the EU enlargement opened new markets for those established in Europe but also widened the available supply conditions on the continent. Quickly after the fall of the Berlin Wall EU15 companies established in Central and Eastern European countries and herewith revived the local car industry, a particularly dynamic sector in the CEEC before World War II. Nowadays, 1.3 M vehicles are produced in Central and Eastern Europe, mainly in a pole which includes the south of Poland, the 2/3 of Slovakia, the north and west of Hungary and the Czech Republic. In the coming years, production will reach around 3.5 M vehicles. What are the main characteristics of this automobile pole ? How have the "traditional" locations of Europe adjusted and which conclusions can be drawn?

* Through the examination of trade between the main European producing countries of vehicles this study shows that

- there is a particularly strong polarization of trade between Germany and the Central European countries on one hand and, on the other hand, a more targeted geographical specialization between France and Slovenia, between Italy and Poland and Italy and South-Eastern Europe;
- the CEEC are well integrated into European productive processes, observed through a growing production and trade of car parts; whereas, at the beginning of the transition, these countries rather fitted into a "qualified assembling" relation with the EU15 countries;
- the structure of CEEC exports is particularly concentrated on few products;
- two-way trade between Central and Eastern European countries and the EU15 is quite high, but still not reaching the level observed between the high income countries of Europe; between countries of the region, this type of trade remains weak; furthermore CEEC-EU two-way trade of similar products develops quickly.

* The nature of trade between Germany and these countries, which shows a very high level of two-way trade with a significant and increasing share of the vertical type, as well as the weight of Germany in the CEEC's total automobile trade, indicate that the companies settled in Germany having located their whole or part of their production in Central and Eastern Europe should have benefited from the EU enlargement. But the German territory and in particular its low or not qualified labour force should belong to the losers of enlargement (although only from a relative point of view) and, conversely the qualified one gained. Indeed, if the employment and wages of the latter category improved during the period in question, the employment and wages of the first remained roughly unchanged, what represents "only" a relative loss. It would, however, be interesting to go into this point in depth, in particular to examine if Germany homogeneously adjusted across its territory or not. Currently, it seems that car production facilities located in the west of Germany meet more difficulties than in the Eastern part. Two factors reduced the potential negative impact of the emergence of this new pole: first, the CEEC are "small economies" comparatively to Germany and, second, they represent an additional demand on a European scale.

The adjustments for the French territory should thus be even more limited. And until now, the Hexagon has, in the automobile sector, rather benefited from this enlargement to the east. In this research it appears that the Iberian and CEEC automobile poles truly compete only on low and mid-end vehicle ranges. It is reasonable to suppose that the effects of geographic distance and the associated logistic constraints reduce direct competition between these two

poles, particularly for car components. But this question of competition or complementarity between the Iberian pole and the CEEC would also deserve to be studied further on. It would be particularly interesting to distinguish and compare the trade relations between Spain and the pole dominated by Germany, on one hand, and the cluster centered on the north and East of France (see map in Introduction), on the other hand.

* Last, it should be noticed that Slovakia and, to a lesser extent, Hungary and the Czech Republic develop a strong specialization and thus dependence on this sector. In case of an asymmetrical shock, these “small (very) specialized economies” could be affected.

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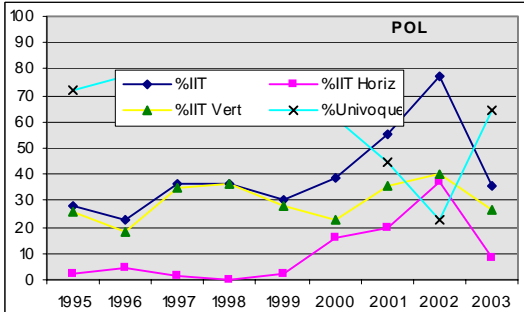
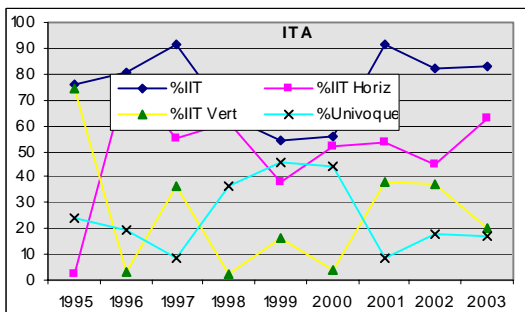
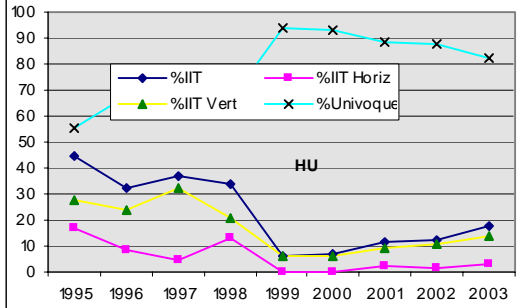
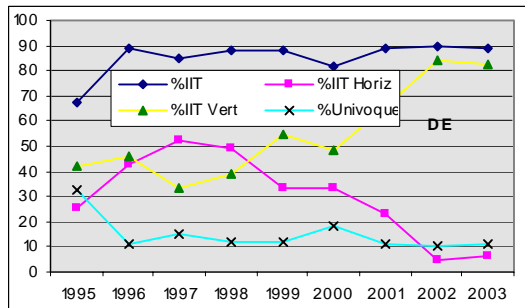
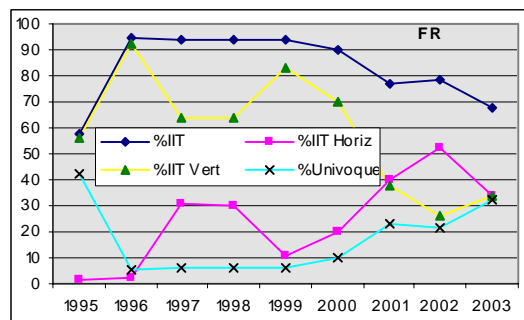
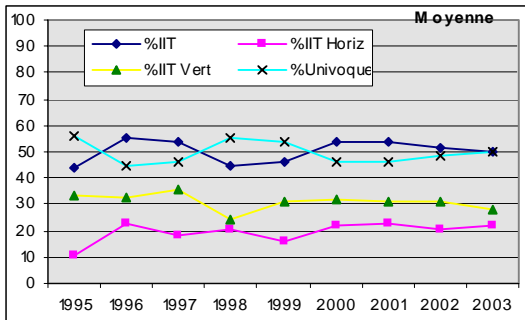
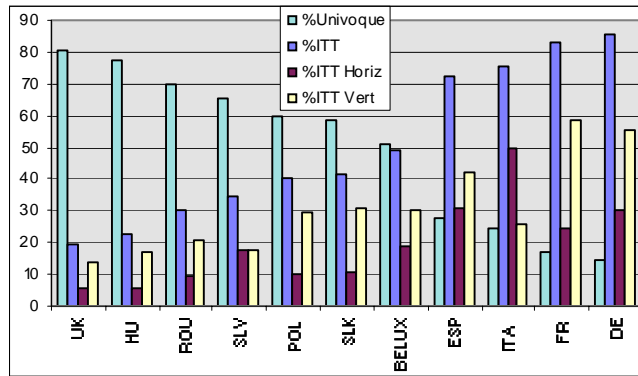
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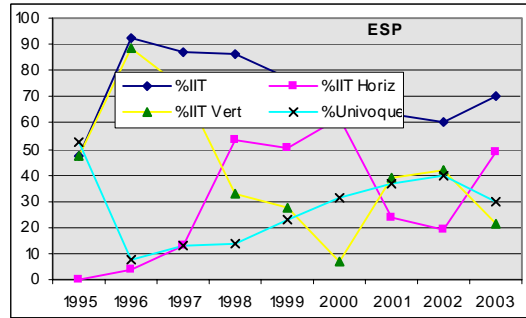
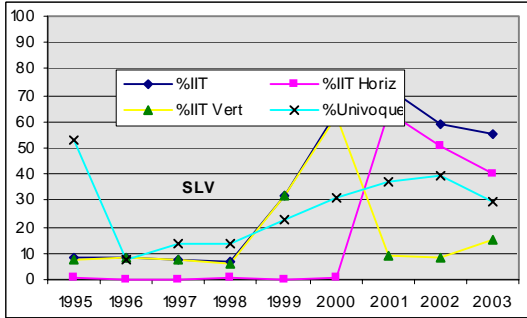
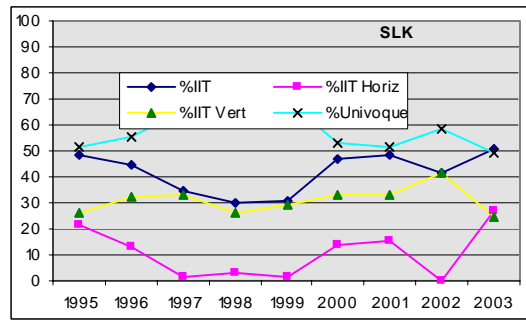
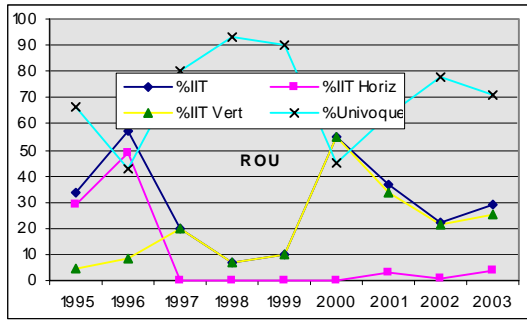
Evolutions of the CEEC' types of trade

For each CEEC (and Spain), the graphics show

- for the 1995-2003 period, the average share over the period of one-way trade, two-way trade, two-way horizontal and vertical trade
- changes between 1995 and 2003 of one-way trade, two-way trade, two-way horizontal and vertical trade (12 countries average, DE, FR, ITA, ESP, CZ, HU, SLK, POL)

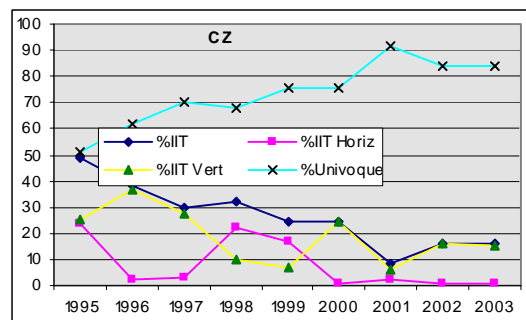
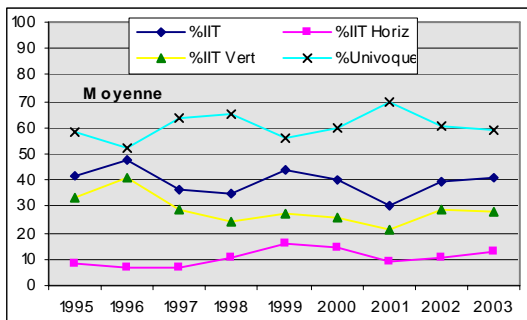
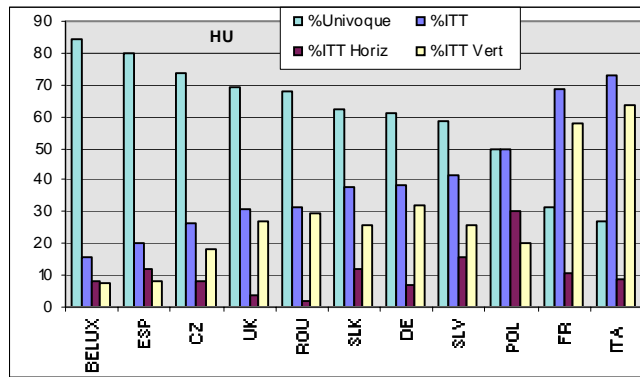
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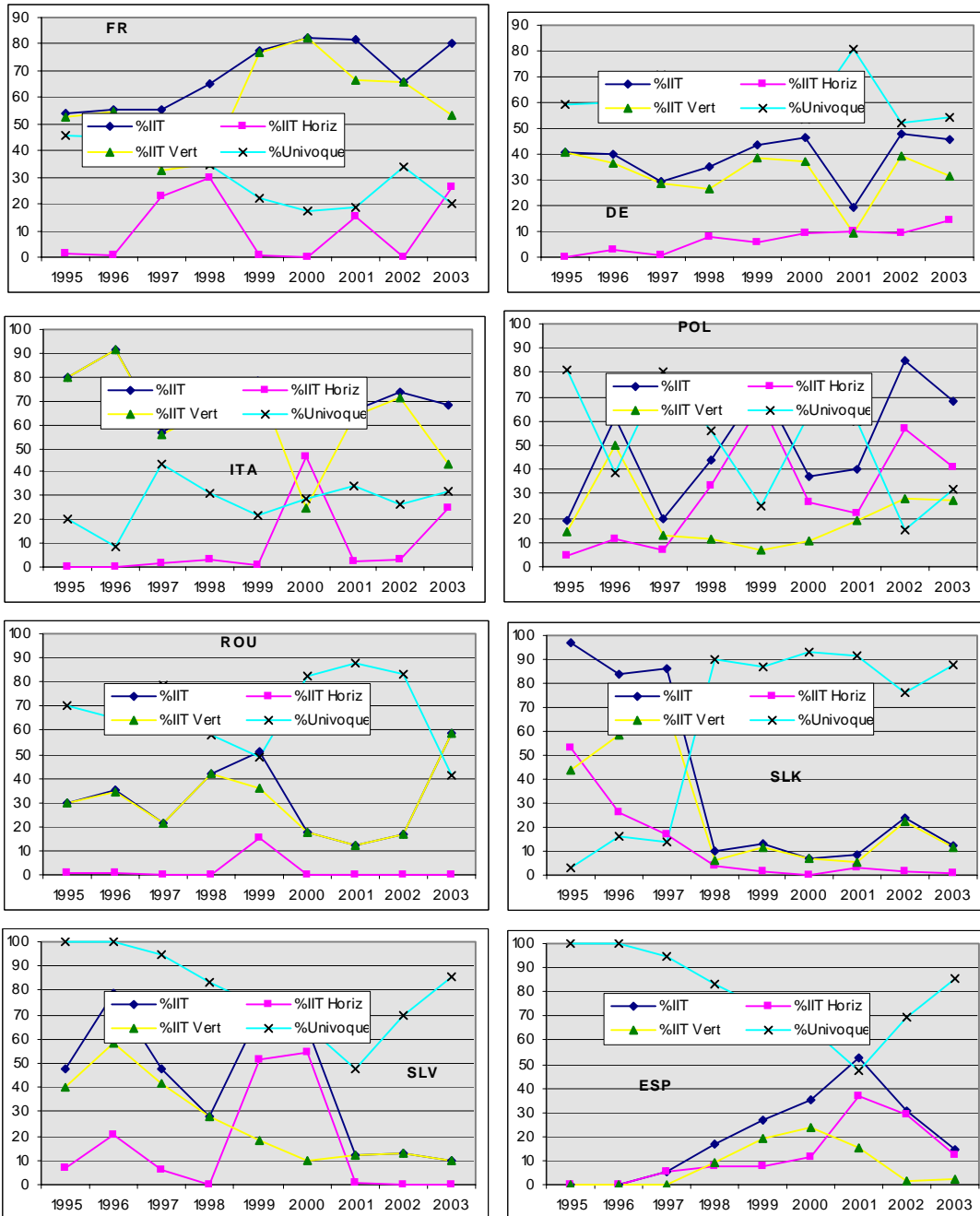




Source : Comtrade, calculs des auteurs

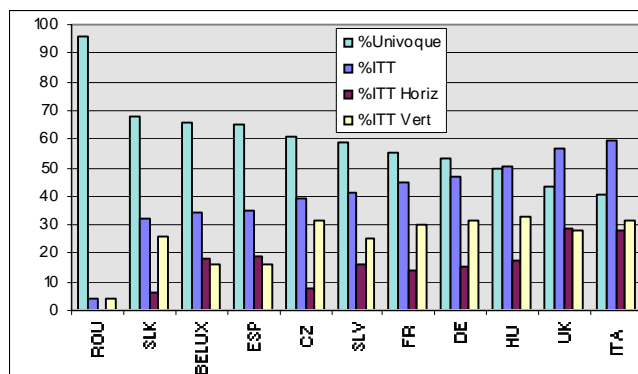
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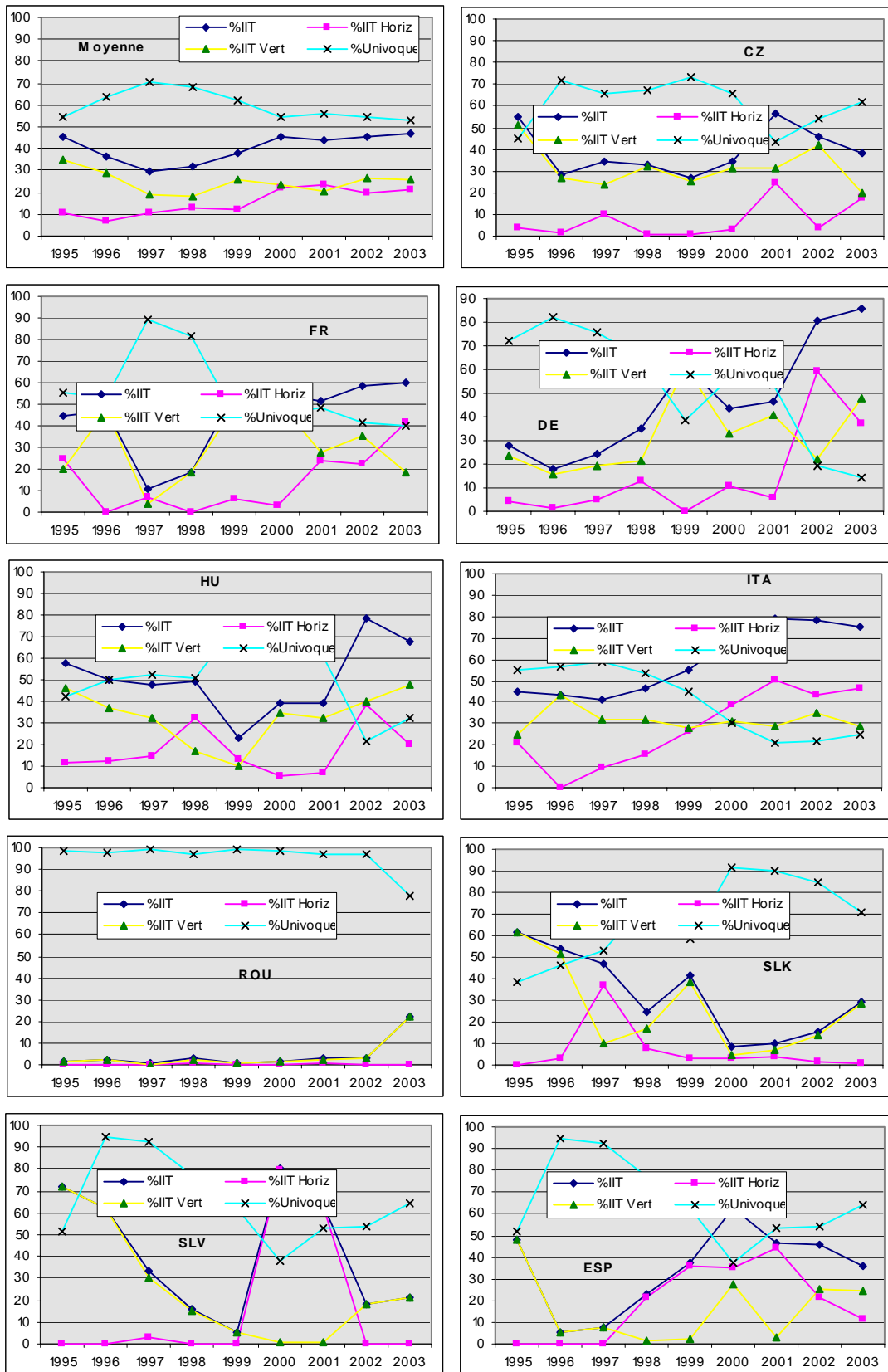




Source : Comtrade, calculs des auteurs

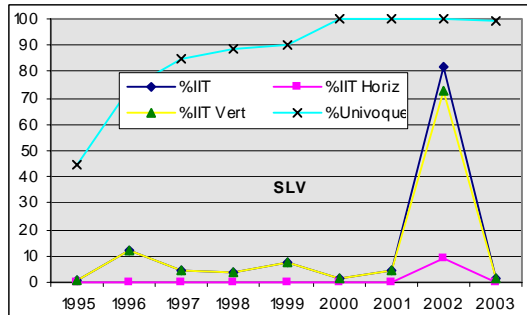
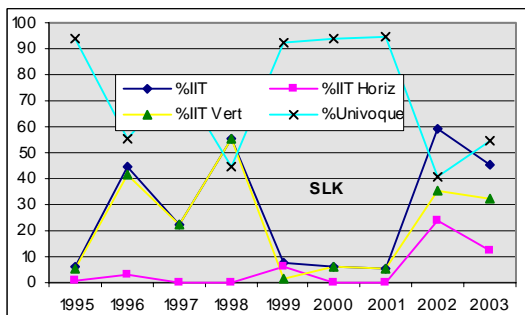
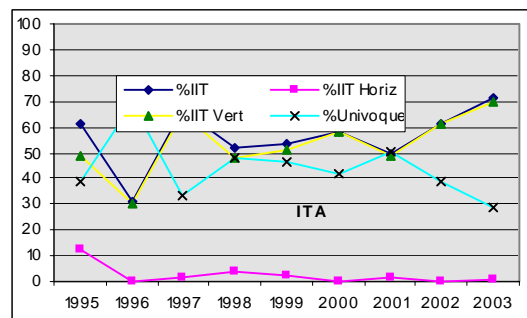
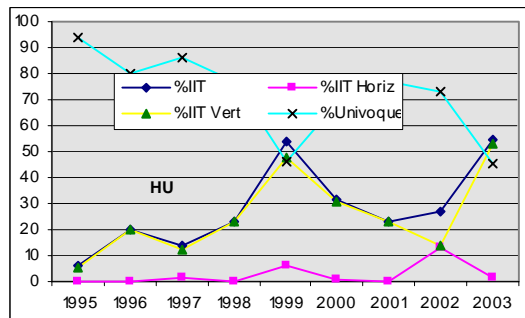
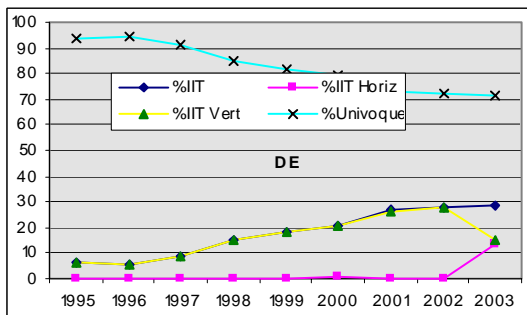
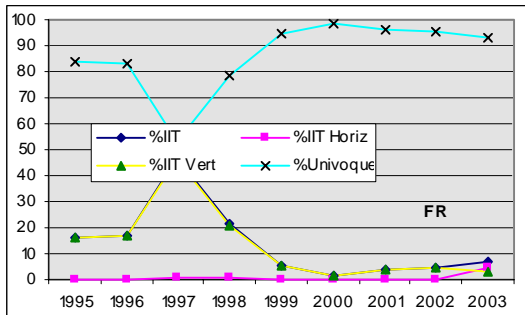
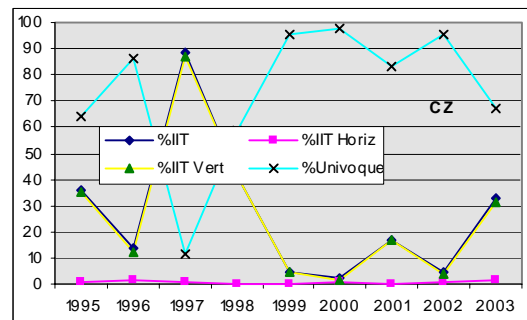
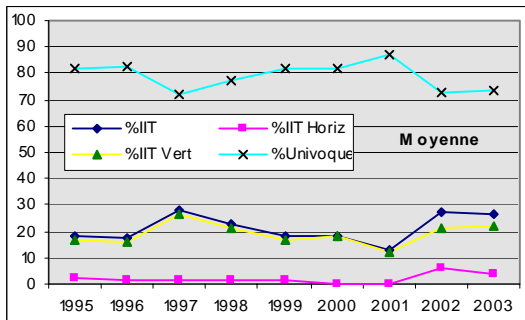
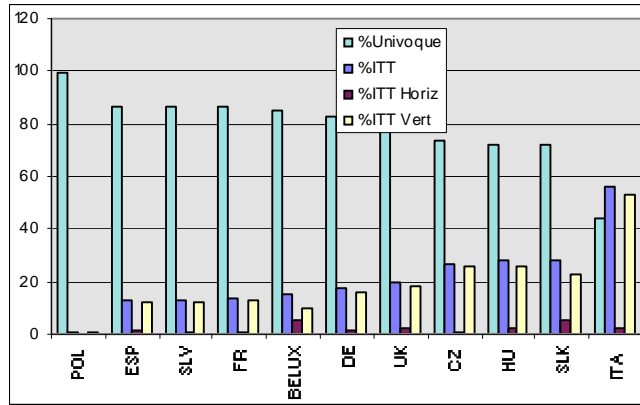
3. Poland



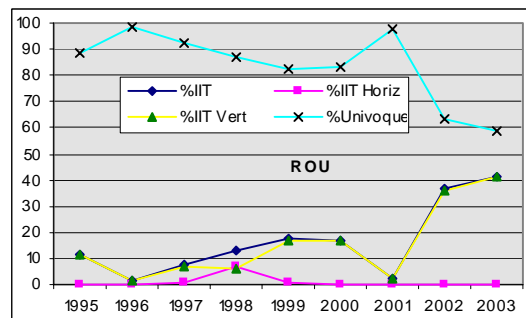
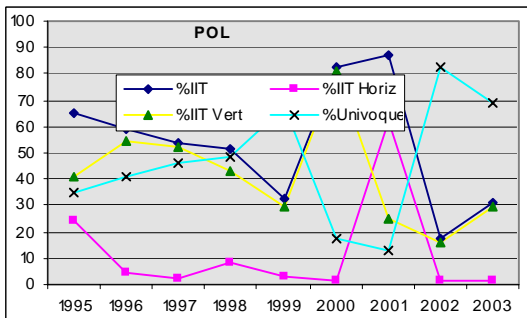
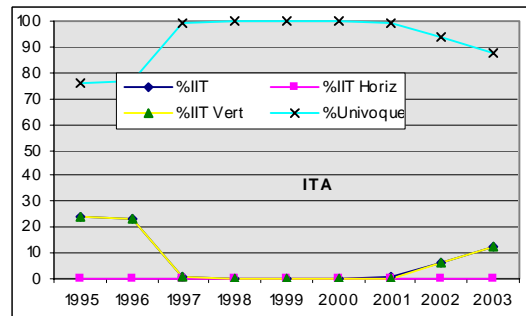
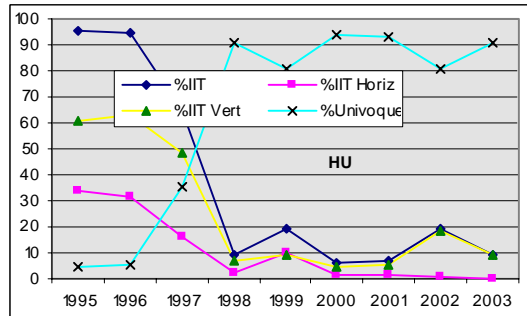
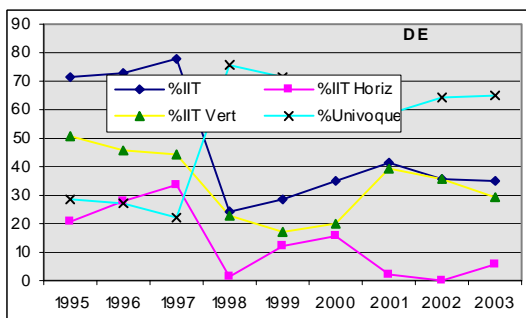
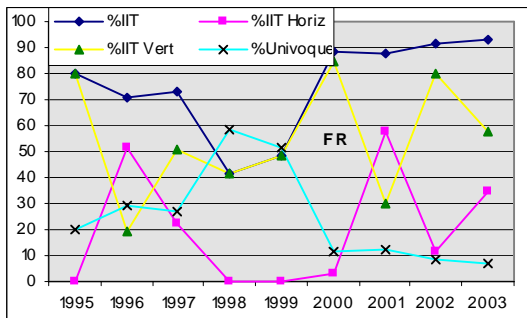
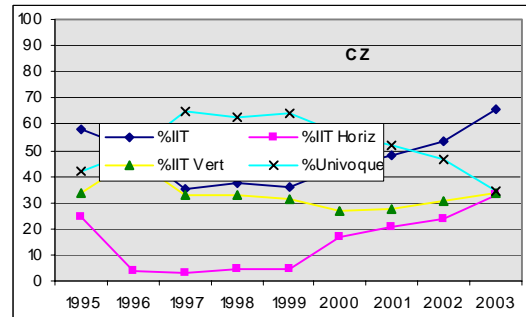
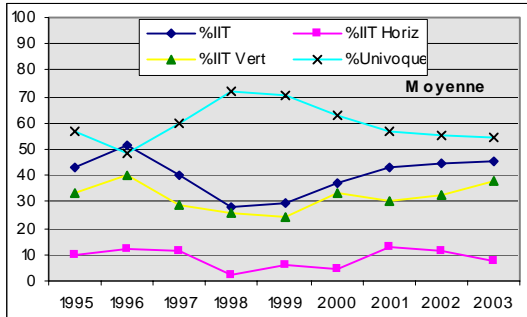
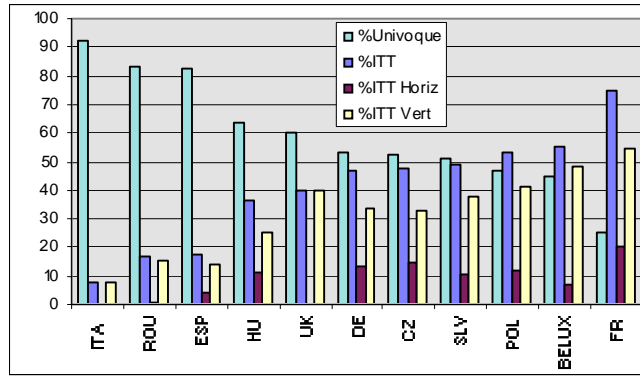


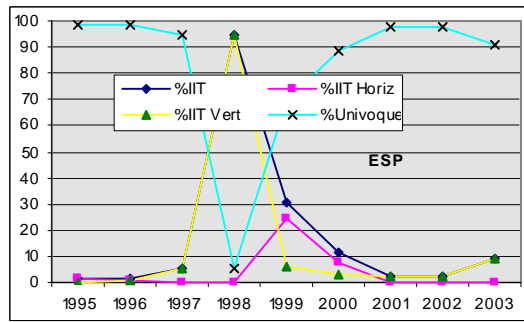
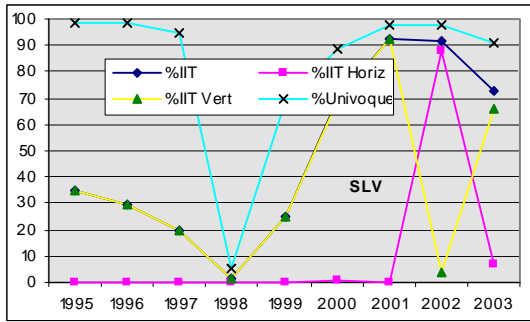
Source : Comtrade, calculs des auteurs

4. Romania

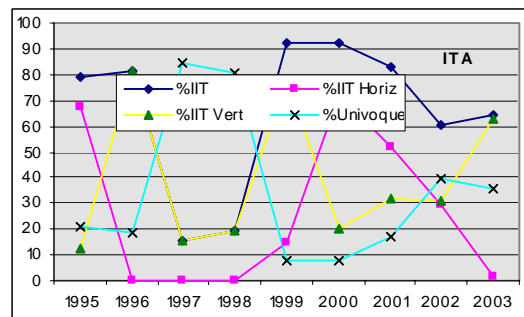
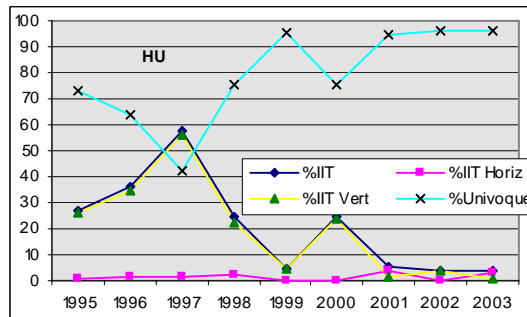
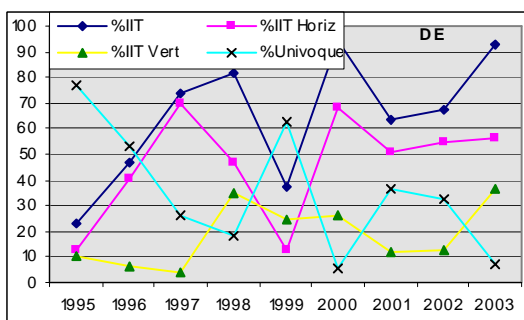
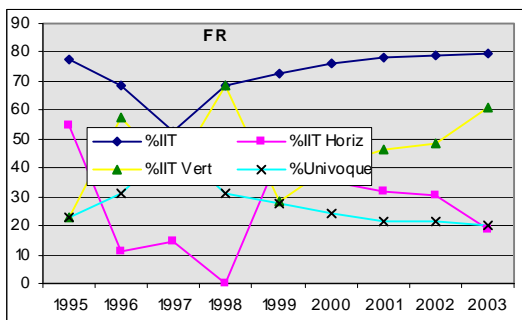
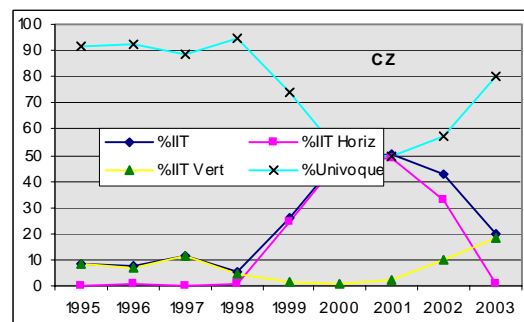
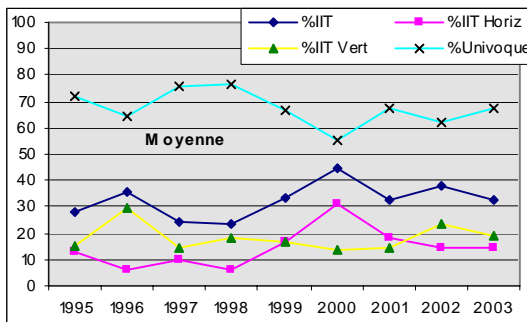
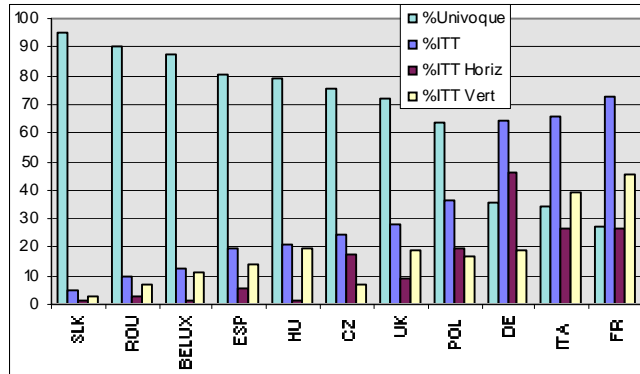


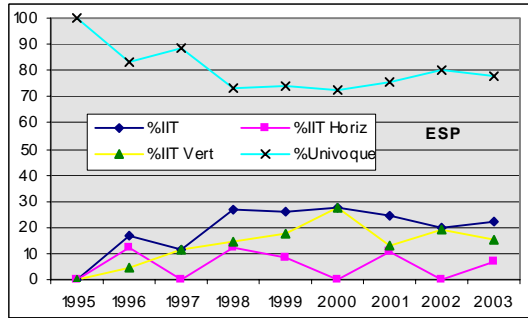
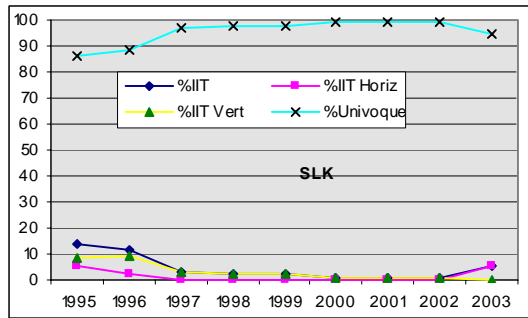
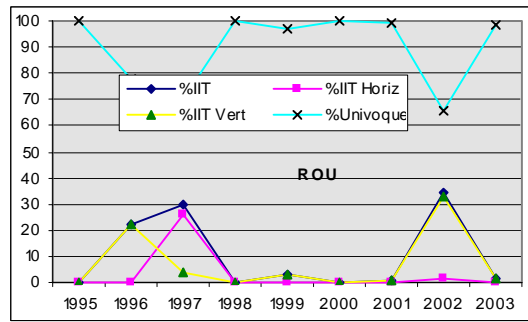
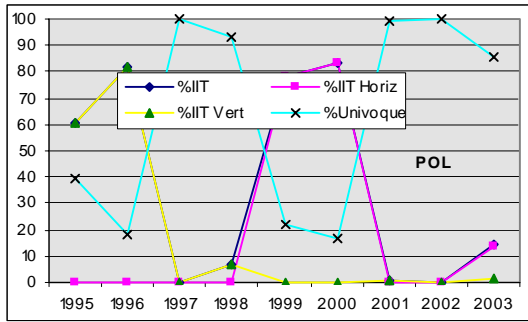
5. Slovakia



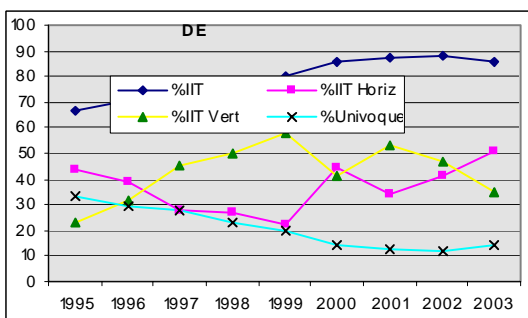
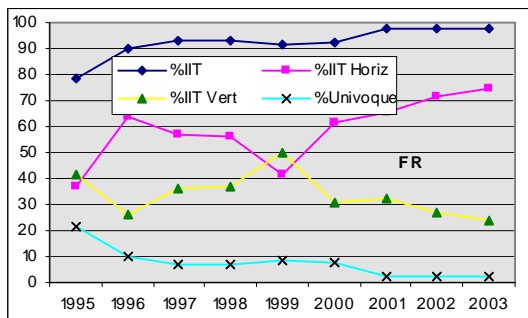
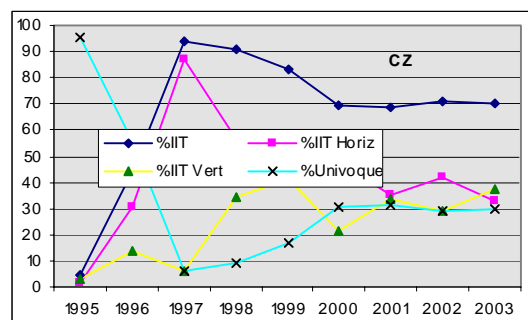
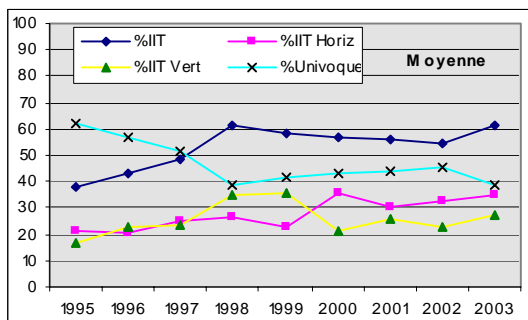
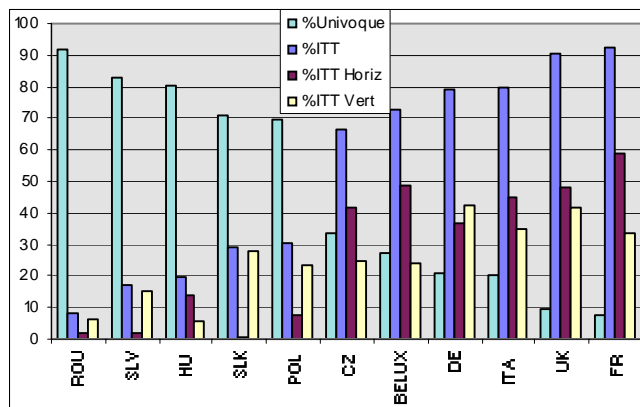


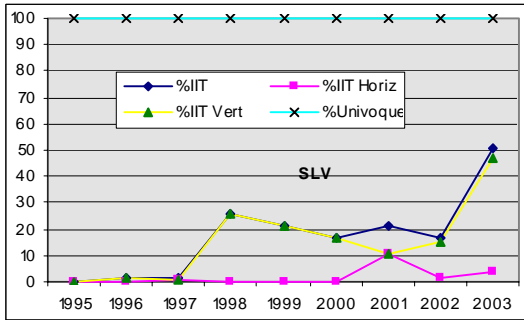
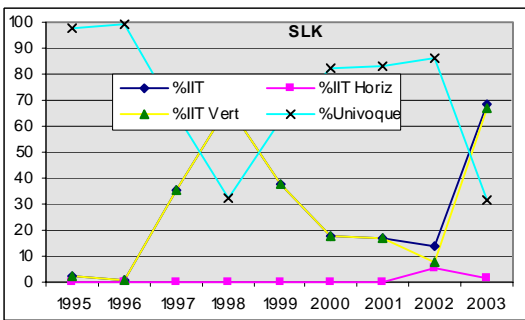
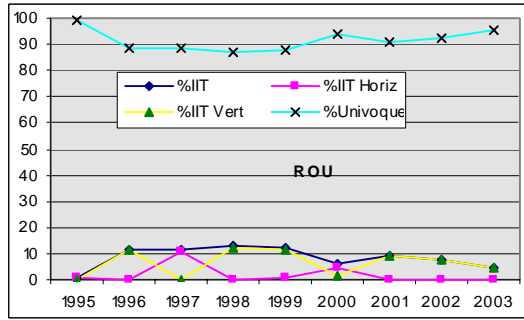
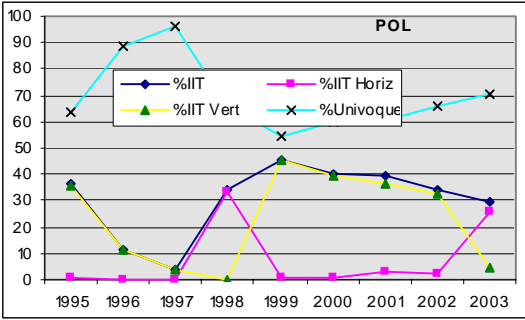
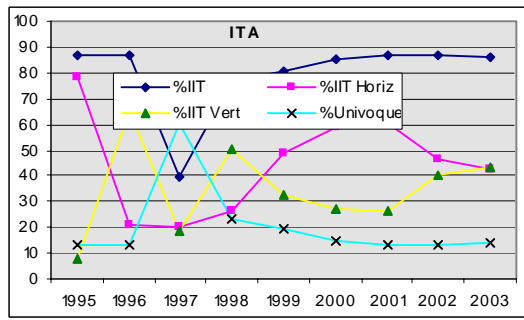
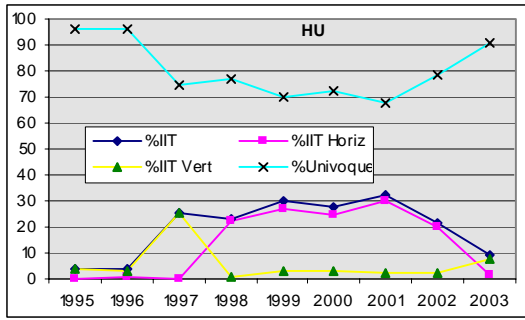
6. Slovenia





7. Spain





Nomenclature produits utilisée et libellés

- 870321 Voitures de tourisme et autres véhicules principalement conçus pour le transport de personnes, y.c. les voitures du type 'break' et les voitures de course, à moteur à piston alternatif à allumage par étincelles, cylindrée $\leq 1.000 \text{ cm}^3$ (sauf véhicules pour
- 870322 Voitures de tourisme et autres véhicules principalement conçus pour le transport de personnes, y.c. les voitures du type 'break' et les voitures de course, à moteur à piston alternatif à allumage par étincelles, cylindrée $> 1.000 \text{ cm}^3$ mais $\leq 1.500 \text{ cm}^3$ (sa
- 870323 Voitures de tourisme et autres véhicules principalement conçus pour le transport de personnes, y.c. les voitures du type 'break' et les voitures de course, à moteur à piston alternatif à allumage par étincelles, cylindrée $> 1.500 \text{ cm}^3$ mais $\leq 3.000 \text{ cm}^3$ (sa
- 870324 Voitures de tourisme et autres véhicules principalement conçus pour le transport de personnes, y.c. les voitures du type 'break' et les voitures de course, à moteur à piston alternatif à allumage par étincelles, cylindrée $> 3.000 \text{ cm}^3$ (sauf véhicules pour
- 870331 Voitures de tourisme et autres véhicules principalement conçus pour le transport de personnes, y.c. les voitures du type 'break' et les voitures de course, à moteur à piston à allumage par compression 'diesel ou semi-diesel', cylindrée $\leq 1.500 \text{ cm}^3$ (sauf
- 870332 Voitures de tourisme et autres véhicules principalement conçus pour le transport de personnes, y.c. les voitures du type 'break' et les voitures de course, à moteur à piston à allumage par compression 'diesel ou semi-diesel', cylindrée $> 1.500 \text{ cm}^3$ mais \leq
- 870333 Voitures de tourisme et autres véhicules principalement conçus pour le transport de personnes, y.c. les voitures du type 'break' et les voitures de course, à moteur à piston à allumage par compression 'diesel ou semi-diesel', cylindrée $> 2500 \text{ cm}^3$ (sauf vé
- 870390 Voitures de tourisme et autres véhicules principalement conçus pour le transport de personnes, y.c. les voitures du type 'break' et les voitures de course (sauf véhicules pour se déplacer sur la neige et autres véhicules spéciaux du n° 8703.10)
- 870710 Carrosseries pour voitures de tourisme
- 870810 Pare-chocs et leurs parties de tracteurs, véhicules pour le transport de dix personnes ou plus, chauffeur inclus, voitures de tourisme, véhicules pour le transport de marchandises et véhicules à usages spéciaux du n° 8701 à 8705, n.d.a
- 870821 Ceintures de sécurité pour véhicules
- 870831 Garnitures de freins montées, pour tracteurs, véhicules pour le transport de dix personnes ou plus, chauffeur inclus, voitures de tourisme, véhicules pour le transport de marchandises et véhicules à usages spéciaux
- 870839 Freins et servo-freins, et leurs parties, pour de tracteurs, véhicules pour le transport de dix personnes ou plus, chauffeur inclus, voitures de tourisme, véhicules pour le transport de marchandises et véhicules à usages spéciaux, n.d.a.
- 870840 Boîtes de vitesse, pour tracteurs, véhicules pour le transport de dix personnes ou plus, chauffeur inclus, voitures de tourisme, véhicules pour le transport de marchandises et véhicules à usages spéciaux
- 870850 Ponts avec différentiel, y.c. avec d'autres organes de transmission, pour véhicules automobiles
- 870860 Essieux porteurs et leurs parties, pour tracteurs, véhicules pour le transport de dix personnes ou plus, chauffeur inclus, voitures de tourisme, véhicules pour le transport de marchandises et véhicules à usages spéciaux n.d.a.
- 870870 Roues, leurs parties et accessoires pour tracteurs, véhicules pour le transport de dix personnes ou plus, chauffeur inclus, voitures de tourisme, véhicules pour le transport de marchandises et véhicules à usages spéciaux, n.d.a.
- 870880 Amortisseurs de suspension, pour tracteurs, véhicules pour le transport de dix personnes ou plus, chauffeur inclus, voitures de tourisme, véhicules pour le transport de marchandises et véhicules à usages spéciaux
- 870891 Radiateurs, pour tracteurs, véhicules pour le transport de dix personnes ou plus, chauffeur inclus, voitures de tourisme, véhicules pour le transport de marchandises et véhicules à usages spéciaux
- 870892 Silencieux et tuyaux d'échappement, pour tracteurs, véhicules pour le transport de dix personnes ou plus, chauffeur inclus, voitures de tourisme, véhicules pour le transport de marchandises et véhicules à usages spéciaux
- 870893 Embrayages et leurs parties, pour tracteurs, véhicules pour le transport de dix personnes ou plus, chauffeur inclus, voitures de tourisme, véhicules pour le transport de marchandises et véhicules à usages spéciaux, n.d.a.
- 870894 Volants, colonnes et boîtiers de direction, pour tracteurs, véhicules pour le transport de dix personnes ou plus, chauffeur inclus, voitures de tourisme, véhicules pour le transport de marchandises et véhicules à usages spéciaux
- 940120 Sièges pour véhicules automobiles
- 840731 Moteurs à piston alternatif à allumage par étincelles -moteurs à explosion-, des types utilisés pour la propulsion des véhicules du chapitre 87, cylindrée $\leq 50 \text{ cm}^3$
- 840732 Moteurs à piston alternatif à allumage par étincelles -moteurs à explosion-, des types utilisés pour la propulsion des véhicules du chapitre 87, cylindrée $> 50 \text{ cm}^3$ mais $\leq 250 \text{ cm}^3$
- 840733 Moteurs à piston alternatif à allumage par étincelles -moteurs à explosion-, des types utilisés pour la propulsion des véhicules du chapitre 87, cylindrée $> 250 \text{ cm}^3$ mais $\leq 1000 \text{ cm}^3$
- 840734 Moteurs à piston alternatif à allumage par étincelles -moteurs à explosion-, des types utilisés pour la propulsion des véhicules du chapitre 87, cylindrée $> 1000 \text{ cm}^3$
- 840790 Moteurs à piston alternatif ou rotatif, à allumage par étincelles -moteurs à explosion- (autres que moteurs pour aéronefs, moteurs pour la propulsion de bateaux et autres que les moteurs à piston alternatif des types utilisés pour la propulsion des véhicules
- 840820 Moteurs à piston, à allumage par compression -moteurs diesel ou semi-diesel-, des types utilisés pour la propulsion des véhicules du chapitre 87
- 851110 Bougies d'allumage pour moteurs à allumage par étincelles ou par compression
- 851120 Magnétos, dynamos-magnétos, volants magnétiques, pour moteurs à allumage par étincelles ou par compression
- 851130 Distributeurs, bobines d'allumage, pour moteurs à allumage par étincelles ou par compression
- 851140 Démarreurs, même fonctionnant comme génératrices, pour moteurs à allumage par étincelles ou par compression
- 851150 Génératrices pour moteurs à allumage par étincelles ou par compression, (autres que dynamos-magnétos et démarreurs fonctionnant comme génératrices)
- 851180 Appareils et dispositifs électriques d'allumage pour moteurs à allumage par étincelles ou par compression, y compris joncteurs-disjoncteurs, (autres que génératrices, démarreurs, distributeurs, bobines d'allumage, magnétos, volants magnétiques et bougies d'allumage)
- 851190 Parties des appareils et dispositifs électriques d'allumage et de démarrage, génératrices etc. repr. sous 8511, n.c.a.
- 851210 Appareils électriques d'éclairage ou de signalisation visuelle des types utilisés pour les bicyclettes (à l'excl. des lampes du no 8539)
- 851220 Appareils électriques d'éclairage ou de signalisation visuelle, pour automobiles, (à l'exclusion des lampes du n° 8539)
- 851230 Appareils électriques de signalisation acoustique, pour bicyclettes ou pour automobiles
- 851240 Essuie-glaces, dégivreurs et dispositifs antibuée électriques, des types utilisés pour automobiles
- 851290 Parties des appareils électriques d'éclairage, de signalisation, essuie-glaces, dégivreurs et dispositifs antibuée, des types utilisés pour automobiles, n.c.a.