

## INDUSTRY OR SERVICES: THE EUROPEAN SPECIALIZATION DILEMMA

Since 2000, international trade has been characterized by a strong demand for primary products, an acceleration of exports from large emerging countries and a rise in trade in services under the leadership of developed countries. How did European specialization evolve in such environment? Europe turns out to have strengthened its tertiary specialization while keeping a strong industrial positioning; in this respect, it stands between the United States and Japan. Further analysis of European countries' comparative advantages shows a great diversity and significant recomposition over the past decade. While most countries within the European Union maintain a solid industrial specialization and/or have reinforced their specialization in new services, the comparative advantages of some member States are still concentrated in traditional services with a weak growth potential.

### ■ The rise of new services spurred by developed countries

Trade in manufactured goods, services and primary products accounted for, respectively, 68%, 20% and 13% of world trade in 2007 (1) (see table 1). The industrial sector therefore remains preeminent in the world trade even though its share decreased by three points since 1995, mostly due to relative price evolutions: rising prices in primary products and declining prices in various manufacturing sub-sectors (electronics, textile...). Trade in services have grown at a similar pace to world trade as a whole (+8.5% per annum in value) and have therefore kept their share unchanged. However the nature of the services traded has deeply changed thanks to technical innovation. Digitalization of information has induced new forms of production and consumption. Some services, which previous technology did not allow to be exchanged, have become an important share of international trade. International nomenclature has these services labeled "other services" (2) in order to distinguish them from transportation and travel (tourism in particular). These services now account for more than half of tertiary exchanges. Their growth is by far greater than that of international trade: +24% per annum from 1995

to 2007 for computing and information services, +16% for financial services, +11% for insurance services, +10% for royalties and license fees, communication services and cultural services (table 1).

Table 1 - World Trade in goods and services\*, relative shares and growth

	Share of each sector (%)		Average annual growth (%)		Shares of developed countries**			
	1995	2007	1995-07	2007-09	Exports		Imports	
Goods and services	100	100	+8.5	-4.6	77	65	75	68
Primary products	9	13	+11.2	-3.6	41	29	74	67
Manufactured goods	71	68	+8.2	-6.0	81	68	75	68
Services	20	20	+8.5	-0.8	81	77	77	72
of which (Services = 100)								
Transportation	27	24	+7.3	-7.0	82	75	74	66
Travel	32	25	+6.2	-3.3	76	66	82	73
Other services	42	52	+10.5	+3.0	85	83	74	74
of which (Other serv. = 100)								
Computer & Information	2	7	+23.6	+6.8	98	69	93	80
Finance	6	12	+16.4	-8.9	95	96	86	85
Insurance	6	6	+11.2	+2.5	77	86	64	67
Royalties and license	10	10	+10.1	+4.8	99	98	93	81
Communication	5	4	+10.1	+1.7	70	68	87	80
Culture	2	2	+9.9	-2.8	75	81	82	76
Other business	51	44	+9.2	+1.5	81	81	74	76
Construction	6	4	+7.8	+5.5	84	74	79	50
Government	10	5	+4.6	+3.5	83	74	47	49

\* Trade recorded in the balance of payments (modes 1 and 2).

\*\* United States, Can., EU-15, Switzerland, Norway, Isl., Israël, Japan., Aust., N.-Z., H.-K., Singap; South Korea and Taiwan.

Source: CEPII, CHELEM International Trade and CHELEM Balance of payments databases, authors' calculations.

1. Data are available until 2009. Given the strong impact on trade of the 2008-2009 crisis, one refers to year 2007 in Table 1 and to the average 2006-2008 in charts 2 and 3.

2. 200BA topic of the fifth edition of the Balance of Payments Manual (BPM5) classification, IMF 1993.

Developed countries have initiated and still control technological mutations in the tertiary sector. As a result, they dominate international services exchanges and their share in international exports is very high (77%). They have given up a mere four points to emerging countries over the 1995-2007 period, while losing 13 points in global manufactured exports. In the “other services” category, developed countries account for more than 95% of world exports in “royalties and license fees” and “financial services”.

Developed countries altogether remain net exporters of tertiary goods. In services (other than transportation and travel), their surplus, in steep growth since the mid 1990s, compensates for almost half of their deficit in primary products in 2007 (+372 vs -784 billion dollars). The weight of these services in international trade is not far from matching that of primary products (10% vs 13%).

Let’s finally mention that the financial crisis led to a severe drop in the exchange of manufactured goods (-6% annualized on average between 2007 and 2009, table 1) and that while the drop was moderated for primary products (-3.6%), it was very limited for services in general (-0.8%), “other services” having registered an exceptional growth (+3%) given the environment.

## ■ Although involved in the tertiary sector, Europe has not reduced its industrial specialization

The international specialization of a country brings to light the benefits and drawbacks of its productive capacities (see box 1) (3). The CEPII’s CHELEM database which provides consistent data over large periods allows to analyze this structural component of a nation’s competitiveness. Chart 1 exhibits the strengths and weaknesses of the United States, the European Union (EU-27) and Japan for the three major sectors (primary products, manufactured goods and services). The beneficial trend on services can be observed in all three zones, but the difference in specialization profiles happens in the relative positioning of manufacturing and services. Japan, for instance, has its sole comparative advantage in manufactured goods while the strengths of the United States are concentrated in the tertiary sector. With the exception of insurance services, the United States have comparative advantages in all categories. “Royalties and license fees” come first, a sector in which they are by far the world leader.

The EU stands in between. It is strongly specialized in services without however being disengaged from the industrial sector: manufactured goods and services currently are strengths of equal weight for the EU. Mechanics, chemicals and automobile have long been the backbone of European industry and they are still. Yet, services have made an

### BOX: THE MEASUREMENT OF COMPARATIVE ADVANTAGES

International specialization of economies (their comparative advantages and disadvantages) is here measured through the CEPII’s indicator of contribution to the trade balance (CSC) (<http://www.cepii.fr/francgraph/bdd/chelem/indicateurs/indicpresent.htm>). It compares, in thousandths of total trade, the real trade balance of a country for one specific product with a theoretical balance corresponding to no specialization.

$$ACR_i^k = \frac{1000}{X_i^{total} + M_i^{total}} \times \left[ \frac{(X_i^k - M_i^k)}{\text{real balance}} - \frac{(X_i^{total} - M_i^{total}) \times \left( \frac{X_i^k + M_i^k}{X_i^{total} + M_i^{total}} \right)}{\text{theoretical balance}} \right]$$

where  $X$  are exports and  $M$  imports of the country  $i$  for the product  $k$ .

In order to eliminate the cyclical effects induced by an overall balance in imbalance and bring out only the specific situation of the products against each other, the theoretical balance is calculated to reflect an equilibrium situation: if there were no comparative advantage or disadvantage, then the total trade surplus or deficit would be distributed across all products according to their share in total trade. The contribution to the trade balance is the difference between the actual balance and this proportional, theoretical balance. The indicator is additive and the sum of all products is zero.

The range of comparative advantages (the scale of contributions to the balance) is used to understand the differences between countries in their degree of specialization.

extraordinary breakthrough within European specialization; financial services, computing and information services, other business services in particular. In 2007, when the financial crisis started, financial products were ranked as the first comparative advantage for the EU, ahead of specialized machines.

## ■ Diversified specialization in the EU

In order to assess the situation of EU members, we analyze their positions on major sectors at the end of 2000 and their evolutions over a decade (charts 2a and 2b). We also provide the first five comparative advantages for each country, as a percentage of total comparative advantages (chart 3). Only three EU countries benefit from comparative advantages in primary products (chart 2a): Denmark (crude oil, natural gas), Estonia (iron ores, agricultural products) and Latvia (agricultural products). The main strength of the latter Baltic countries however lies in the tertiary sector where they have strengthened their positions in “other services”.

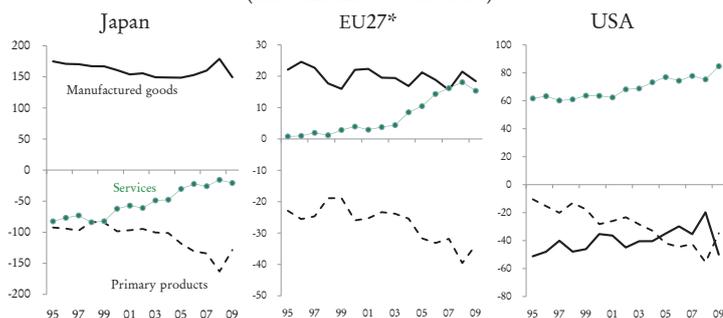
Regarding industry and services, three models stand out depending on the level of specialization:

### ◆ A strong industrial specialization

This model is characteristic of Germany, Finland, Ireland and Italy. However since the mid 1990s, Italy is the only country of the four to have significantly accrued its comparative

3. For details, see C.Herzog et D. Ünal, Panorama de la spécialisation européenne, 2011: [www.cepii.fr/francgraph/bdd/chelem/panorama/europe.htm](http://www.cepii.fr/francgraph/bdd/chelem/panorama/europe.htm).

Chart 1 – Revealed comparative advantages by sectors (thousandths of total trade)



\* The intra-EU flows are included, as the origine and destination country for trade in services is unknown. This has little effect on the position of the major branches against each other, but amplifies the scale of the indicator (trade in goods including intra-EU are three times higher).

Source: CEPII, CHELEM International Trade and CHELEM Balance of payments, authors' calculations.

advantage in industry (+10 points). It has clearly disengaged from textile-clothing, but benefits from a powerful and rising specialization in mechanics (machines and engines in particular). It is also the EU country with the most diversified specialization (chart 3). Ireland has a state of the art chemical industry (basic organic products and pharmaceuticals) and strong comparative advantages in electronics thanks to the branches of multinational companies which are located there. In the tertiary sector, the activity of those branches has a strong symmetrical impact on the Irish balance for two services sectors: this small country records both the strongest surplus of the EU for computing and information services, and the largest deficit for royalties and license fees. The five main comparative advantages of Ireland represent 80% of its overall comparative advantages, which makes it one of the most specialized country of the EU. Another small country, Finland is very specialized in the wood and paper chain thanks to its natural resources; yet over the past 10 years its comparative advantages in this chain have decreased while it maintains its position in electronics and gains some ground in mechanics and electricity. As for Germany, its specialization is similar to that of Japan within the Triad: its surpluses are the highest in automobile, mechanics and chemicals. In automobile, the German industry which was previously focused on premium products has accrued its comparative advantages in middle range products as it obtained cheap and skilled workforce from new member States subcontractors.

◆ A balance between industry and services

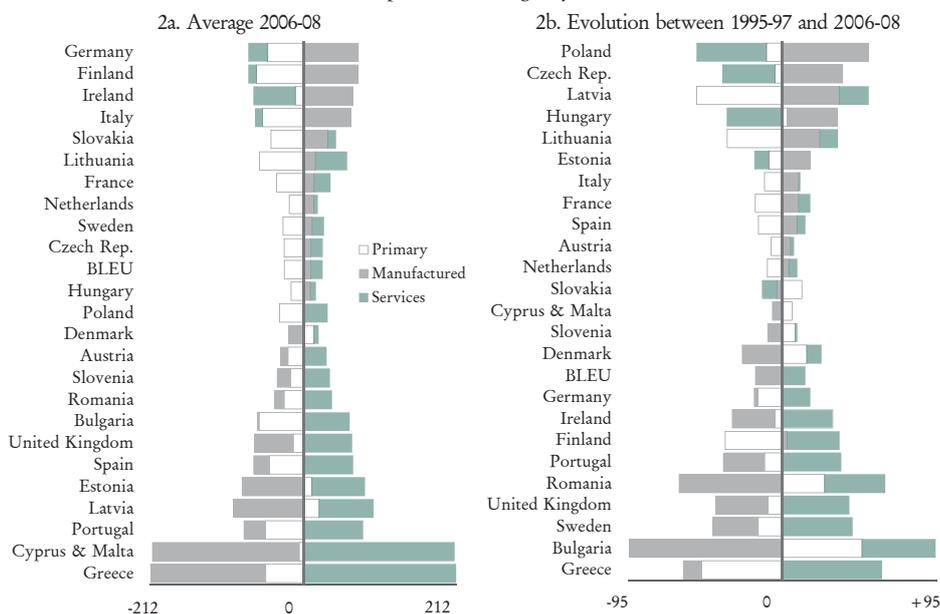
Among European countries whose specialization in the large sectors is relatively balanced, there are three

types of situations. Firstly, France and the Netherlands had homogeneous specializations in the mid 1990s at the aggregated level, and they have not modified their share in industry and services. Secondly, Sweden which has almost fully converted its initial positions on industry into services, focusing on new services with a strong growth potential (other corporate services, royalties and license fees, computing and information services). Lastly, Central European countries have significantly strengthened their positions in manufacturing (chart 2b). Indeed, the enlargement to the East has led, through Germany, to an industrial dynamic which deeply changed the specialization of the new member States. Those economies are more and more committed to automobile (Poland, Czech Republic, Slovakia, Hungary), mechanics (Poland, Czech Republic) and electronics (Hungary, Slovakia). This new industrial dynamic has had impacts on the specialization of other member States. The comparative advantages of France, Belgium-Luxembourg and Sweden have thus significantly decreased in automobile. France has in return reinforced its strengths in pharmaceuticals, aeronautics and new services (royalties and patents). The Netherlands are little specialized: they keep extensive surpluses in agro-food and have managed to turn a disadvantage in mechanics into an advantage (machines and engines) while gaining ground in other corporate services.

◆ A strong tertiary specialization

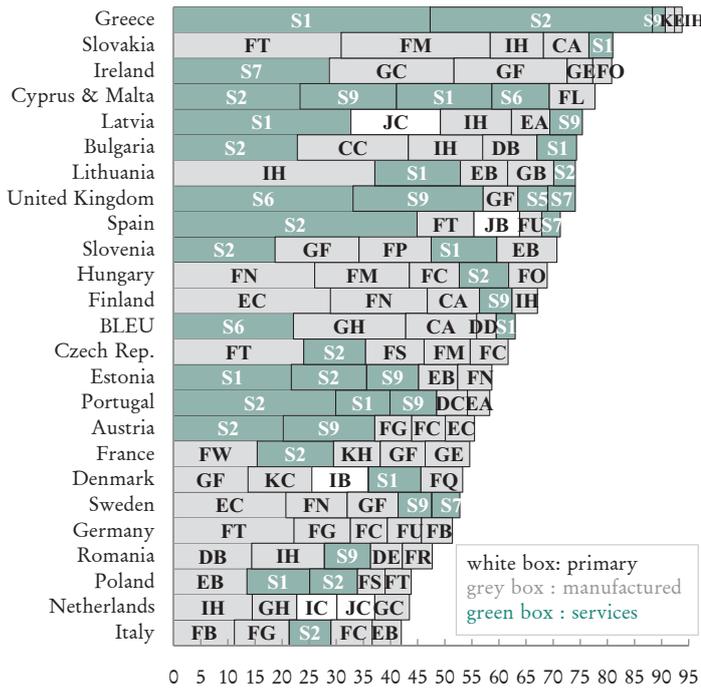
The large (and sometimes exclusive) specialization of some 10 member States in the tertiary sector appears today as one of the EU's vulnerability. Most of these states, still catching up on the core economies of the EU and deeply impacted by the global crisis, essentially depend on traditional services with low growth potential. It is particularly worrisome of Greece

Chart 2 – Revealed comparative advantages by sectors: EU27 members



Source: CEPII, CHELEM International Trade and CHELEM Balance of payments, authors' calculations.

Chart 3 – The five strengths of specialization :  
EU27 members, average 2006-2008



CA	Iron Steel	FN	Telecommunications equipment	IB	Crude oil
CC	Non ferrous metals	FP	Computer equipment	IC	Natural gas
DB	Clothing	FP	Domestic electrical appliances	IH	Refined petroleum products
DC	Knitwear	FQ	Electrical equipment	JB	Other edible agricultural prod.
DD	Carpets	FR	Electrical apparatus	JC	Non-edible agricultural prod.
DE	Leather	FS	Vehicles components	KC	Meat
EA	Wood articles	FT	Cars and cycles	KE	Preserved fruits
EB	Furniture	FU	Commercial vehicles	KH	Beverages
EC	Paper	FW	Aeronautics	S1	Transportation
FB	Miscellaneous hardware	GB	Fertilizers	S2	Travel
FC	Engines	GC	Basic organic chemicals	S5	Insurance
FG	Specialized machines	GE	Toiletries	S6	Finance
FL	Electronic components	GF	Pharmaceuticals	S7	Computer
FM	Consumer electronics	GH	Plastic articles	S9	Other business

Note: The five strengths are detailed to a level of the 81 items of the goods and services topics of the CHELEM sectoral classification. They are shown as a percent age of the sum of comparative advantages of each country. One may compare the intensity of specialization within the Union. Greece, where the top five strengths account for 94% of their comparative advantages overall is the member country whose specialization is the most intense, while Italian seems the most diversified. Source: CEPII, CHELEM International Trade and CHELEM Balance of payments, authors' calculations.

whose comparative advantages in transport and travel services account for 85% of their comparative advantages overall. Spain and Portugal respectively get 45% and 30% of their total comparative advantages from tourism. However they also have

significant industrial advantages: Spain in automobile and agro-food, Portugal in textile and wood-paper. Austria seems in a better situation. Although tertiary (travel and other corporate services) is its only sector with comparative advantages, Austria has some strengths in industry, intermediary goods and equipment, offset by weaknesses in consumer goods. The United Kingdom, like the United States, has long disengaged from industry to invest massively into services. However the British tertiary specialization is not as diversified as that of the American economy: financial services have a dominating stance (a third of total comparative advantages). The first rank occupied by those services in the EU-27 as a whole is due to the United Kingdom..

\* \* \*

Europe's specialization as a whole turns out to be intermediary within the Triad: neither as industrial as Japan, nor as tertiary as the United States. This global situation however overlooks sharp national contrasts. Among the weakened countries of the Euro zone, the situation of Greece whose comparative advantages are exclusively concentrated on traditional services is worrisome. Italy and Ireland as well as Spain and Portugal, on the contrary, have better assets in the face of international competition thanks to a more diversified specialization.

Colette Herzog & Deniz Ünal  
deniz.unal@cepil.fr

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EDITORIAL OFFICES  
Centre d'études prospectives  
et d'informations internationales  
113, rue de Grenelle  
75700 Paris SP 07  
Tél. : 33 (0)1 53 68 55 14  
Fax : 33 (0)1 53 68 55 03

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